2024
PROSPECTUS

PART 8

FACULTY OF SCIENCE

ISSN 0258-7343

CONTACT DETAILS
At time of publication, the contact details were as follows:

Admission enquiries
Tel: 012 382 5750/5780 E-mail address: admission@tut.ac.za

Contact Centre
Tel: 086 1102 421/012 382 5533 E-mail address: general@tut.ac.za

Enquiries relating to fees:
The Chief Financial Officer
Private Bag X680
PRETORIA 0001
Tel: 086 1102 422/012 382 5505/4213

The Registrar
Private Bag X680
PRETORIA 0001
Tel: 012 382 5180

ARCADIA CAMPUS
Private Bag X680
PRETORIA 0001
Tel: 012 382 6377

175 Nelson Mandela Drive
PRETORIA
GPS: (25°44'41.83"S 28°12'0.19"E)

ARTS CAMPUS
Private Bag X680
PRETORIA 0001
Tel: 012 382 6177

Cnr. Du Toit and Edmund Streets
PRETORIA
GPS: (25°44'26.16"S 28°11'45.99"E)

EMALAHLENI CAMPUS
The Campus Director
PO Box 3211
EMALAHLENI 1035
Tel: 012 382 3100/4/6

19 OR Tambo Street
EMALAHLENI
GPS: (25°52'44.40"S 29°14'09.89"E)

GA-RANKUWA CAMPUS
Private Bag X680
PRETORIA 0001
Tel: 012 382 0500/0840

2827, Zone 2, Botsi Street
GA-RANKUWA
GPS: (25°37'05.92"S 28°00'08.31"E)

MBOMBELA CAMPUS
The Campus Director
Private Bag X11312
MBOMBELA 1200
Tel: 012 382 3500/3621

Madiba Drive
MBOMBELA
GPS: (25°30'01.11"S 30°57'17.03"E)

POLOKWANE CAMPUS
The Campus Director
Private Bag X9496
POLOKWANE 0700
Tel: 012 382 0700

Cnr. Market and Excelsior Streets
POLOKWANE
GPS: (23°54'50.81"S 29°26'58.94"E)

PRETORIA CAMPUS
Private Bag X680
PRETORIA 0001
Tel: 012 382 5911

Staatsartillerie Road
PRETORIA WEST
GPS: (25°43'53.55"S 28°09'40.38"E)

SOSHANGUVE CAMPUS
Private Bag X680
PRETORIA 0001
Tel: 012 382 9000

2 Aubrey Matlala Road, Block K
SOSHANGUVE
GPS: (25°32'26.88"S 28°05'46.16"E)

PARTS OF THE PROSPECTUS

Please Note:

1. Although the information in this Prospectus has been compiled as accurately as possible, the Council accepts no responsibility for any inaccuracies in this publication. This Prospectus is valid for 2024 only.

2. Life Orientation and an achievement Level of 1 in a subject are not considered in the calculation of the Admission Point Score (APS).

3. Prospective students will not be admitted to any qualification without prior evaluation.

4. The indicated non-refundable administration fee and certified copies of your identity document, Senior Certificate/National Senior Certificate and all other relevant documents must accompany the completed application form or online application.

5. The closing dates for admissions are available on the University's website.

6. A student must complete a qualification at the learning site where he/she was accepted and is registered. A transfer between sites will only be allowed if the student follows the following process:

    - A formal request must be submitted to the academic manager/Head of the Department on the current learning site before the second Friday in May (to be considered for transfer in July of the same year) or the second Friday in October (to be considered for a transfer in January of the following year). The request must contain the reasons for the transfer.

    - A committee will meet shortly after each of the closing dates for submissions to consider every request on merit, keeping in mind the availability of space and the adherence to enrolment quotas on respective learning sites. Students will be informed of the outcome.

Important:
TUT admission requirements for entry-level programmes adhere to national legislation and therefore the following are required:

- Bachelor's degrees: at least four subjects at performance level 4.

- Diplomas: at least four subjects at performance level 3.

Please verify specific and additional requirements per programme as indicated in the Prospectus.

ACCEPTANCE IS SUBJECT TO AVAILABLE CAPACITY ACCORDING TO THE STUDENT ENROLMENT PLAN (SEP)
Alternative and international qualifications (HIGSCE, IGCSE, NSSC A&O Level, IB Higher and Standard Level, etc.) are dealt with in a specific manner:

- While there is a legal imperative to submit the certificate of equivalence (issued by SAQA or the CHE), it is recommended that the application process be initiated while the application for certificate is in process.

- The Tshwane University of Technology cannot obtain this certificate on your behalf.

CONVERSION OF ALTERNATIVE/EQUIVALENT RECOGNISED CERTIFICATES

The following table and accompanying information give an indication of how the University will evaluate the various certificates that may be offered as equivalent to the National Senior Certificate (SA). Where possible, the University will evaluate the listed qualifications as indicated. However, the University has the right to refer any application to the formal application processes through the Senate.

APS	NSC	NC-V	HIGCSE	IGCSE/GCSE/ NSSC O-LEVEL		A-LEVEL	IB-HL	IB-SL	SAT
				Gr 11	Gr 12				
10						A	7		
9									
8						B	6		
7	7 (80 -100)	Outstanding competent (80-100%)	1	A		C	5	7	80-100
6	6 (70 -79)	4-Highly competent (70-79%)	2	B		D	4	6	70-79
5	5 (60-69)	3-Competent (60-69%)	3	C	A	E	3	5	60-69
4	4 (50-59)	3-Competent (50-59%)		D	B		2	4	50-59
3	3 (40-49)	Not yet Competent (40-49%)	4	E	C		1	3	40-49
2	2 (30-39)	Not achieved (0-39%)		F	D/E			2	30-39
1	1 (0-29)			G	F/G			1	0-29

NSC	National Senior Certificate
NC-V	National Certificate (Vocational)
IGCSE	International General Certificate of Secondary Education
HIGCSE	Higher International General Certificate of Secondary Education
SAT	Senior Academic Test/Senior Academic Proficiency Test
NSSC	Namibia Senior Secondary Certificate
O-LEVEL	Ordinary level
A-LEVEL	Advanced level
IB	International Baccalaureate Schools (higher and standard levels)

Please Note:

As from March 2005, a minimum score of 1500 is needed for admission to a National Diploma, with a subminimum of not less than 460 for Critical Reading, Mathematics and Writing. In accordance with HESA requirements, a minimum score of 1600 is needed for admission to a degree, with a subminimum of not less than 500 for Critical Reading and Mathematics and 550 for Writing. The percentiles on the SAT certificate can be used to derive scores for Mathematics and English, as indicated in the table above. The student's college entrance certificate (such as the certificate issued by the ACE School of Tomorrow) or individual SAT subject tests should be used for the scores of any other subjects required.

RECOGNITION OF PRIOR LEARNING, EQUIVALENCE AND STATUS

Candidates may also apply at the Office of the Registrar for Recognition of Prior Learning (RPL) or for admission via the Senate's discretionary route. The specific relevant documentation will be requested from these applicants, and these cases will be handled on an individual basis (see Chapter 30 of Part 1 of the Prospectus).

CONTENTS

FACULTY OF SCIENCE

At time of publication, the information was as follows:

Executive Dean:	Prof N Mokgalaka - DTech (Chemistry), MBA (Education Management) (Haaga-Helia University of Applied Sciences) (Finland)
Executive Secretary: Telephone numbers: Office:	MML Malatja 012 382 6209/6208 Building 1, Room 1-121A, Arcadia Campus
Assistant Dean: (Research, Innovation and Engagement)	Prof Y Paul - PhD (Sport Sciences) (UP)
Acting Assistant Dean: (Teaching, Learning and Technology)	Prof Y Havenga - M Cur (Psychiatric Nursing) (UJ), D Cur (Nursing) (UJ)
Acting Assistant Registrar: Telephone number: Office:	J Mokonyane 012 382 6248 Building 1, Room G14, Arcadia Campus

VISION

A people's university that makes knowledge work.

MISSION

We advance social and economic transformation through relevant curricula, impactful research and engagement, quality learning experiences, dedicated staff and an enabling environment.

VALUE STATEMENTS

- **Integrity**
  We will always act honestly, ethically and professionally.
- **Care**
  We will treat everyone with dignity and respect and green our environment.
- **Diversity, Inclusion and Equity**
  We will embrace diversity, foster inclusivity and promote equity.
- **Excellence**
  We will constantly innovate, solve problems and aim to improve ourselves and others.
- **Accountability**
  We are answerable to each other and will act in the best interest of the university at all times.

SECTION A: DEPARTMENTS AND QUALIFICATIONS

1. ADELAIDE TAMBO SCHOOL OF NURSING SCIENCE

1.1 BACHELOR OF NURSING

BNursing - NQF Level 8 (551 credits)

Qualification type: Professional Bachelor's Degree

Qualification code: BPNS20

SAQA ID: 98958, CHE NUMBER: H/H16/E035CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

- **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

  Admission requirement(s):
  A Senior Certificate with a matriculation endorsement or an equivalent qualification, with a D symbol at Higher Grade or a B symbol at Standard Grade for English, Mathematics and Biology.

  Alternative and international qualifications will be assessed on the equivalent issued by the South African Qualifications Authority (SAQA) with their application forms for admission.

  Selection criteria:
  To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **25**.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics and 4 for Life Sciences.

  Alternative and international qualifications will be assessed on the equivalent issued by the South African Qualifications Authority (SAQA) with their application forms for admission. Please note that the minimum requirements for registration at the South African Nursing Council as a learner nurse is an A-level or a Senior Certificate.

  Selection criteria:
  To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **25** (excluding Life Orientation).

b. Assessment procedure(s):
The selection process will consist of the following phases:
- Phase 1: An administrative screening process of academic performance score (APS) of each student.
- Phase 2: If the APS is between 25 and 29 the applicant will write a TUT potential assessment. The applicant with minimum TUT potential test score of 50% will be eligible for consideration into the programme.
- Phase 3: The applicant with an APS score of 30 and above will not write the TUT potential assessment test but will automatically be eligible to be selected in the programme.

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes.

f. *Minimum duration:*
Four years.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. *Work-Integrated Learning:*
Attendance of the allocated Work-Integrated Learning is compulsory. If a student has not completed all Work-Integrated Learning hours and reached the practical objectives in the various clinical areas, including simulated skills and service learning, he/she will be excluded from proceeding to the next year of study. In addition, students in the fourth year of study should submit the completed midwifery register. Students who do not meet the minimum required number of Work-Integrated Learning hours at the end of the fourth academic year will have to re-register to complete the Work-Integrated Learning.

A student can only be registered with the South African Nursing Council in the category nurse and midwife once the required number of Work-Integrated Learning hours are completed and all learning objectives are met.

i. *General information for registration with the South African Nursing Council (SANC):*
All students undergoing education or training in nursing must apply to the South African Council to be registered as a Learner Nurse. Documents must be submitted to SANC within 30 days of commencement, therefore all documents must be submitted to the Nursing School before 15 February of the relevant year. Failing to do so will result in penalties which will be payable by the student. Should a student terminate and later resume their nursing studies, termination and re-registration with SANC as a Learner Nurse is required. Please contact the academic department for further information.

j. *Community Service:*
After completion of this programme, South African Citizens are required to do one year community service as set out in section 40 of the Nursing Act, 2005 (Act No. 33 of 2005) and in the Regulations Relating to Performance of Community Service published in Government Notice No. 765 of 24 August 2005. Students should note that placement for Community Service is done by the National Department of Health, the School can therefore not guarantee placement. All students are expected to write a Professional Board examination before they can be registered for Community Service.

k. *Practicals:*
It is compulsory for students to attend 100% of the practicals, and they must pass each practical component of a particular module in order to pass the module.

l. *Exit-level outcomes:*
- Applies scientific nursing and midwifery skills and technologies in rendering a comprehensive nursing service.

- Maximises the utilisation of resources to improve the quality of health care and services.
- Applies the principles of research in nursing and midwifery practice.

m. Other requirements:
Students should have professional indemnity during the full period of registration. Textbooks and other educational material will be required. A specific uniform, safety wear and equipment are compulsory, and a levy will be charged to enable the Department to purchase the necessary uniforms and equipment for each student.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
ALI125X	Academic Literacy (block module)	(5)	(2)	
CNR105P	Clinical Nurse Training I (WIL)	(5)	(25)	
COE105X	Communication for Academic Purpose	(5)	(10)	
CPL105X	Computer Literacy	(5)	(10)	
LFS125X	Life Skills (block module)	(5)	(2)	
NTP105P	Nursing Theory and Practice I	(5)	(24)	
FIRST SEMESTER				
GA1115P	General Anatomy I	(5)	(12)	
GPY115P	General Physiology I	(5)	(12)	
NRE115P	Nursing Ethos and Professional Practice I	(5)	(6)	
SECOND SEMESTER				
GA2116P	General Anatomy II	(6)	(12)	General Anatomy I
GMB115P	General Microbiology	(5)	(6)	
IPN115P	Introduction to Pharmacology in Nursing	(5)	(6)	
TOTAL CREDITS FOR THE FIRST YEAR:			**127**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CNM206P	Clinical Nurse and Midwife Training II (WIL)	(6)	(42)	Clinical Nurse Training I (WIL) General Anatomy II General Physiology I Nursing Theory and Practice I
NTP206P	Nursing Theory and Practice II	(6)	(24)	Clinical Nurse Training I (WIL) General Anatomy II General Physiology I Nursing Theory and Practice I
PSS206P	Psycho-Social Science I	(6)	(12)	
FIRST SEMESTER				
EMN216P	Education and Management in Nursing I	(6)	(6)	
GPY216P	General Physiology II	(6)	(12)	General Anatomy II General Physiology I
PSL215P	Parasitology I	(5)	(6)	
RNS216P	Introduction to Research I	(6)	(6)	

SECOND SEMESTER

APN216P	Applied Pharmacology in Nursing II	(6)	(6)	General Physiology I Introduction to Pharmacology in Nursing
HIM216P	Health Information Management II: Data Analysis	(6)	(6)	
IMW216P	Introduction to Midwifery	(6)	(6)	Clinical Nurse Training I (WIL) General Anatomy II General Physiology I Nursing Theory and Practice I
NRE216P	Nursing Ethos and Professional Practice II	(6)	(6)	Nursing Ethos and Professional Practice I

TOTAL CREDITS FOR THE SECOND YEAR: **132**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CNM307P	Clinical Nurse and Midwife Training III (WIL)	(7)	(42)	Clinical Nurse and Midwife Training II (WIL) General Physiology II Introduction to Midwifery Nursing Theory and Practice II
MDW307P	Midwifery I	(7)	(24)	Clinical Nurse and Midwife Training II (WIL) General Physiology II Introduction to Midwifery Nursing Theory and Practice II
NTP307P	Nursing Theory and Practice III	(7)	(24)	Clinical Nurse and Midwife Training II (WIL) General Physiology II Introduction to Midwifery Nursing Theory and Practice II
PSS307P	Psycho-Social Science II	(7)	(12)	Psycho-Social Science I

FIRST SEMESTER

HIM317P	Health Information Management III	(7)	(6)	Health Information Management II: Data Analysis
NRE317P	Nursing Ethos and Professional Practice III	(7)	(6)	Nursing Ethos and Professional Practice II
RNS317P	Research II: Research Methodology in Nursing	(7)	(6)	Introduction to Research I

SECOND SEMESTER

EMN317P	Education and Management in Nursing II	(7)	(6)	Education and Management in Nursing I
PMF317P	Pharmacology in Nursing III: Midwifery and Specifics	(7)	(6)	Applied Pharmacology in Nursing II Introduction to Midwifery

TOTAL CREDITS FOR THE THIRD YEAR: **132**

FOURTH YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CNM408P	Clinical Nurse and Midwife Training IV (WIL)	(8)	(60)	Clinical Nurse and Midwife Training III (WIL) Midwifery I Nursing Theory and Practice III
CNM418R	Clinical Nurse and Midwife Training IV (WIL) (re-registration) (semester module)	(8)	(0)	
MDW408P	Midwifery II	(8)	(24)	Clinical Nurse and Midwife Training III (WIL) Midwifery I Nursing Theory and Practice III
NTP408P	Nursing Theory and Practice IV	(8)	(20)	Clinical Nurse and Midwife Training III (WIL) Midwifery I Nursing Theory and Practice III
RNS408P	Research III: Research Project in Nursing	(8)	(26)	Research II: Research Methodology in Nursing
FIRST SEMESTER				
NRE418P	Nursing Ethos and Professional Practice IV	(8)	(6)	Nursing Ethos and Professional Practice III
PDS418P	Pharmacology in Nursing IV: Dispensing	(8)	(12)	Pharmacology in Nursing III: Midwifery and Specifics
SECOND SEMESTER				
EMN418P	Education and Management in Nursing III	(8)	(6)	Education and Management in Nursing II
HIM418P	Health Information Management IV	(8)	(6)	Health Information Management III
TOTAL CREDITS FOR THE FOURTH YEAR:			**160**	
TOTAL CREDITS FOR THE QUALIFICATION:			**551**	

1.2 MASTER OF NURSING

MNursing - NQF Level 9 (180 credits)

Qualification code: MNUR17

SAQA ID: 96914, CHE NUMBER: H16/2508/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
A Baccalaureus Technologiae: Nursing, **or** a professional Bachelor's degree in Nursing, **or** an Honours degree in Nursing, **or** an HEQSF-aligned Postgraduate Diploma in Nursing, recognised by the South African Nursing Council as the requirement for registration as a Professional Nurse and obtained from a South African university or Nursing College.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:

- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme. Candidates with a professional baccalaureus technologiae degree may articulate directly into the Master's programme.

b. Selection criteria:
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of one year and a maximum of three years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

CODE	MODULE	NQF-L	CREDIT
NUR509M	Dissertation: Nursing	(9)	(180)
NUR509R	Dissertation: Nursing (re-registration)	(9)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **180**

1.3 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation code for admission and registration: PHNS17)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. *Admission requirement(s):*
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of two years and a maximum of four years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
NU1010O	Thesis: Nursing	(10)	(360)
NU1010R	Thesis: Nursing (re-registration)	(10)	(0)
NU1110R	Thesis: Nursing (re-registration) (semester module)	(10)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **360**

2. DEPARTMENT OF ANIMAL SCIENCES

2.1 DIPLOMA IN ANIMAL SCIENCES

Dip (Animal Sciences) - NQF Level 6 (360 credits)

Qualification code: DPAA19

SAQA ID: 100974, CHE NUMBER: H16/14304/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with at least an E symbol at Higher Grade or a D symbol at Standard Grade for English and Mathematics.

Recommended subject(s):
Preference will be given to applicants with Agricultural Science, Biology and/or Physical Science.

Selection criteria:
Applicants are selected by means of a formula for academic merit, based on scholastic performance. The formula for determination of academic merit are as follows:

SYMBOL	HG VALUE	SG VALUE
A	8	7
B	7	6
C	6	5
D	4	3
E	2	1

Applicants are given two additional points for the following subjects (SG or HG):

Agricultural Economics, Agricultural Science, Agriculture, Biology, Chemistry, Computer Principles, Computer Studies, Field Husbandry, Geography, Mathematics, Physical Science, Physics, Practical Agriculture and/or Statistics.

- Applicants with a score of 23 and more according to the formula for academic merit determination will be considered for admission.
- Applicants with a score of 20 to 22 according to the formula for academic merit determination will be kept on a waiting list from which the applicants with the highest scores will be selected. Waiting lists will be cleared at the end of September and November.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), and 3 for Mathematics or Technical Mathematics or 4 for Mathematical Literacy.

  Recommended subject(s):
  Preference will be given to applicants with Agricultural Sciences, Life Sciences, and/or Physical Sciences.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **19** (with Mathematics or Technical Mathematics) or **20** (with Mathematical Literacy). Life Orientation is excluded from the APS calculation.

  Assessment procedures(s):
  - Applicants with a score of 23 and more will be considered for admission.
  - Applicants with a score of 20 (19 with Mathematics) to 23 will be kept on a waiting list from which the applicants with the highest APS will be selected. Waiting lists will be cleared at the end of September and November.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

  Admission requirement(s):
  A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 50% for English (home language or first additional language) and 40% for Mathematics or 50% for Mathematical Literacy, 40% for Life Orientation (excluded for APS calculation), and 50% for any other three compulsory vocational subjects.

  Assessment procedures(s):
  - Applicants with a score of 23 and more will be considered for admission.
  - Applicants with a score of 20 (19 with Mathematics) to 23 will be kept on a waiting list from which the applicants with the highest APS will be selected. Waiting lists will be cleared at the end of September and November.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **19** (with Mathematics) or **20** (with Mathematical Literacy). Life Orientation is excluded from the APS calculation.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day classes.

e. *Minimum duration:*
Three years.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

g. Training excursions, field trips and practicals:
Training excursions, field trips and practical classes are compulsory and involve additional expenses, over and above the class fees.

h. WIL in Animal Production:
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT
11P105X	Communication for Academic Purposes	(5)	(10)
AAA105D	Animal Anatomy and Physiology I	(5)	(24)
CPL105X	Computer Literacy	(5)	(10)
INI125D	Information Literacy I (block module)	(5)	(2)
LFI125X	Life Skills I (block module)	(5)	(2)
MAS105X	Mathematics and Statistics I	(5)	(12)
SOR105D	Science for Occupational Purpose I	(5)	(12)

FIRST SEMESTER

ENT115D	Entrepreneurship I	(5)	(12)
PAE115D	Pasture Science I	(5)	(12)

SECOND SEMESTER

ABG115D	Animal Breeding and Genetics I	(5)	(12)
ANT115D	Animal Nutrition I	(5)	(12)

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT
BPA206D	Beef Production II	(6)	(24)
DPA206D	Dairy Production II	(6)	(24)
PDN206D	Poultry Production II	(6)	(24)
SSA206D	Small Stock Production II	(6)	(24)
VPA206D	Pig Production II	(6)	(24)

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR
On completion of all the modules.

CODE	MODULE	NQF-L	CREDIT
WAP306D	WIL in Animal Production	(6)	(120)
WAP316R	WIL in Animal Production (re-registration) (first-semester module)	(6)	(0)

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

2.2 ADVANCED DIPLOMA IN ANIMAL SCIENCES

AdvDip (Animal Sciences) - NQF Level 7 (120 credits)

Qualification code: ADAN20

(Specialisation codes for admission and registration: ADAA20 / ADEQ20)

SAQA ID: 110460, CHE NUMBER: H/H16/E062CAN

Campus where offered: Pretoria Campus

REMARKS

a. *Admission requirement(s):*
A National Diploma: Agriculture: Animal Production or Equine Science, **or** a Diploma in Animal Sciences or Equine Science, **or** a Bachelor's degree in Agriculture in the field of Animal Sciences or Equine Science, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Block-mode classes.

f. *Minimum duration:*
One year.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

Students register for one of two options, namely Animal Sciences or Equine Science.

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
Option 1: Animal Sciences (ADAA20)			
AAB107V	Advanced Animal Breeding and Genetics	(7)	(24)
AAH107V	Advanced Animal Health	(7)	(24)
AAR107V	Advanced Animal Reproductive Physiology	(7)	(24)
AAU107V	Advanced Animal Nutrition	(7)	(24)

RBI107V	Research Methodology: Biometry	(7)	(24)

TOTAL CREDITS FOR OPTION 1: **120**

Option 2: Equine Science (ADEQ20)

AAB107V	Advanced Animal Breeding and Genetics	(7)	(24)
AAU107V	Advanced Animal Nutrition	(7)	(24)
AEH107V	Advanced Equine Health Care	(7)	(24)
AER107V	Advanced Equine Reproductive and Exercise Physiology	(7)	(24)
RBI107V	Research Methodology: Biometry	(7)	(24)

TOTAL CREDITS FOR OPTION 2: **120**

2.3 POSTGRADUATE DIPLOMA IN ANIMAL SCIENCES

PGDip (Animal Sciences) - NQF Level 8 (120 credits)

Qualification code: PDAA23

SAQA ID: 119094, CHE NUMBER: H/H16/E221CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
An Advanced Diploma in Animal Sciences, **or** a Baccalaureus Technologiae: Agriculture: Animal Production, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 7 with 120 credits. Preference will be given to candidates who obtained an average of 60% in the previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

All applicants received by the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan (SEP), only the top performing applicants will be selected. A waiting list consisting of the remainder of the applicants will provide an opportunity for applicants to fill places created by accepted students failing to meet the enrolment dates. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes offered over a period of one year. Classes are offered during the day or in the evenings as determined by the Department.

f. Minimum duration:
A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
AAG108G	Applied Animal Breeding and Genetics	(8)	(30)
AAN108G	Applied Animal Nutrition	(8)	(30)
AAR108G	Applied Animal Reproductive Physiology	(8)	(30)
ASR108G	Animal Science Research	(8)	(30)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

2.4 DIPLOMA IN EQUINE SCIENCE

Dip (Equine Science) - NQF Level 6 (360 credits)

Qualification code: DPEQ19

SAQA ID: 100975, CHE NUMBER: H16/14306/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with at least an E symbol at Higher Grade or a D symbol at Standard Grade for English and Mathematics.

Recommended subject(s):
Biology, Mathematics, Physical Science and agricultural subjects.

Selection criteria:
Applicants are selected by means of a formula for academic merit, based on scholastic performance.

Formula for determination of academic merit:

SYMBOL	HG VALUE	SG VALUE
A	8	7
B	7	6
C	6	5
D	4	3
E	2	1

Applicants are given two additional points for the following subjects (SG or HG):

Agricultural Economics, Agricultural Science, Agriculture, Biology, Chemistry, Computer Principles, Computer Studies, Field Husbandry, Geography, Mathematics, Physical Science, Physics, Practical Agriculture and/ or Statistics.

- Applicants with a score of 23 and more according to the formula for academic merit determination will be considered for admission.
- Applicants with a score of 20 to 22 according to the formula for academic merit determination will be kept on a waiting list from which the applicants with the highest scores will be selected. Waiting lists will be cleared at the end of September and November.
- Applicants will be invited for a TUT potential assessment. The APS will contribute 60%, the TUT potential assessment will contribute 40% of the final score.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language) and 3 for Mathematics or Technical Mathematics or 4 for Mathematical Literacy.

Recommended subject(s):
Agricultural Science subjects, Life Sciences, Mathematics and Physical Science.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **19** (with Mathematics or Technical Mathematics) or **20** (with Mathematical Literacy). Life Orientation is excluded from the APS calculation.

Assessment procedures(s):
- Applicants with a score of 23 and more will be considered for admission.
- Applicants with a score of 20 (19 with Mathematics or Technical Mathematics) to 23 will be kept on a waiting list from which the applicants with the highest APS will be selected. Waiting lists will be cleared at the end of September and November.
- Applicants will be invited for a TUT potential assessment. The APS will contribute 60%, the TUT potential assessment will contribute 40% of the final score.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):
A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 50% for English (home language or first additional language) and 40% for Mathematics or 50% for Mathematical Literacy, 40% for Life Orientation (excluded for APS calculation), and 50% for any other three compulsory vocational subjects.

Assessment procedures(s):
- Applicants with a score of 23 and more will be considered for admission.
- Applicants with a score of 20 (19 with Mathematics or Technical Mathematics) to 23 will be kept on a waiting list from which the applicants with the highest APS will be selected. Waiting lists will be cleared at the end of September and November.
- Applicants will be invited for a TUT potential assessment. The APS will contribute 60%, the TUT potential assessment will contribute 40% of the final score.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **19** (with Mathematics) or **20** (with Mathematical Literacy). Life Orientation is excluded from the APS calculation.

b. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

c. Intake for the qualification:
January only.

d. Presentation:
Day classes.

e. Minimum duration:
Three years.

f. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

g. Training excursions, field trips and practicals:
Training excursions, field trips and practical classes are compulsory and involve additional expenses, over and above the class fees.

h. WIL in Equine Sciences I:
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT
11P105X	Communication for Academic Purposes	(5)	(10)
AAA105D	Animal Anatomy and Physiology I	(5)	(24)
CPL105X	Computer Literacy	(5)	(10)
INI125D	Information Literacy I (block module)	(5)	(2)
LFI125X	Life Skills I (block module)	(5)	(2)
MAS105X	Mathematics and Statistics I	(5)	(12)
SOR105D	Science for Occupational Purpose I	(5)	(12)

FIRST SEMESTER

ENT115D	Entrepreneurship I	(5)	(12)
PAE115D	Pasture Science I	(5)	(12)

SECOND SEMESTER

ABG115D	Animal Breeding and Genetics I	(5)	(12)
SMA115D	Stable Management I	(5)	(12)

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT
EVA206D	Equine Veterinary Care II	(6)	(24)
EZA206D	Equine Applied Zootechnology II	(6)	(24)

FIRST SEMESTER

EQN216D	Equine Nutrition II	(6)	(12)
FAR216D	Farriery II	(6)	(12)
MFM216D	Mare and Foal Management II	(6)	(12)
STM216D	Stallion Management II	(6)	(12)

SECOND SEMESTER

ECI216D	Equestrian Coaching and Instruction II	(6)	(12)
EEP216D	Equine Exercise Physiology II	(6)	(12)

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR
On completion of all modules.

CODE	MODULE	NQF-L	CREDIT
WEQ306D	WIL in Equine Sciences I	(6)	(120)
WEQ316R	WIL in Equine Sciences I (re-registration) (first-semester module)	(6)	(0)

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

2.5 MASTER OF AGRICULTURAL SCIENCE

MAgricSci - NQF Level 9 (180 credits)

Qualification code: MDAS19

(Specialisation code for admission and registration: MDAA19)

SAQA ID: 96889, CHE NUMBER: H16/2422/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
A Postgraduate Diploma in Agriculture, **or** a Baccalaureus Technologiae: Agriculture, **or** a Bachelor Honours degree in Agriculture from a South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. *Selection criteria:*
Selection based on a personal interview with a departmental selection panel may be required in certain programmes. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Post-graduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of one year and a maximum of three years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Agricultural Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
APR109M	Dissertation: Agriculture: Animal Production	(9)	(180)
APR109R	Dissertation: Agriculture: Animal Production (re-registration)	(9)	(0)
APR119R	Dissertation: Agriculture: Animal Production (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

2.6 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation codes for admission and registration: PHAA17 / PHAL21 / PHAN21 / PHEQ21)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of two years and a maximum of four years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: PHAA17			
AP1010O	Thesis: Agriculture: Animal Production	(10)	(360)
AP1010R	Thesis: Agriculture: Animal Production (re-registration)	(10)	(0)

AP1110R	Thesis: Agriculture: Animal Production (re-registration) (semester module)	(10)	(0)

Option 2: PHAL21

AL1010O	Thesis: Animal/Livestock Husbandry and Production	(10)	(360)
AL1010R	Thesis: Animal/Livestock Husbandry and Production (re-registration)	(10)	(0)
AL1110R	Thesis: Animal/Livestock Husbandry and Production (re-registration) (semester module)	(10)	(0)

Option 3: PHAN21

AN1010O	Thesis: Agriculture: Animal Sciences	(10)	(360)
AN1010R	Thesis: Agriculture: Animal Sciences (re-registration)	(10)	(0)
AN1110R	Thesis: Agriculture: Animal Sciences (re-registration) (semester module)	(10)	(0)

Option 4: PHEQ21

EQ1010O	Thesis: Horse Husbandry/Equine Science and Management	(10)	(360)
EQ1010R	Thesis: Horse Husbandry/Equine Science and Management (re-registration)	(10)	(0)
EQ1110R	Thesis: Horse Husbandry/Equine Science and Management (re-registration) (semester module)	(10)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **360**

3. DEPARTMENT OF BIOMEDICAL SCIENCES

3.1 BACHELOR OF HEALTH SCIENCE IN CLINICAL TECHNOLOGY

BHSci (Clinical Technology) - NQF Level 8 (496 credits)

Qualification type: Professional Bachelor's Degree

Qualification code: BPCL20

SAQA ID: 111828, CHE NUMBER: H/H16/E148CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

The number of selected students is dependent on the approval and availability of clinical student posts at the participating and HPCSA-accredited training facilities. Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL DIPLOMA AT NQF LEVEL 6:**

  Applicants who completed a relevant national diploma (at NQF Level 6) and who graduated and proceeded to work in industry can apply. Applicants should follow an articulation process in which exemption will be granted for 50% of the credits of the completed (and conferred) national diploma. Detailed information on the process to follow is available at the relevant academic department.

- **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

  Admission requirement(s):
  A Senior Certificate with a matriculation endorsement or equivalent qualification, with a D symbol at Higher Grade, or C symbol at Standard Grade for: English, Mathematics, Physical Science and Biology.

  Selection criteria:
  To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24**.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate or an equivalent qualification, with a bachelor's degree endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics, 4 for Physical Sciences or Technical Sciences and 4 for Life Sciences.

  Selection criteria:
  To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

b. *Assessment procedure(s):*
Applicants will be invited for a TUT potential assessment test and depending on the results will be invited for an interview. Structured panel interviews are conducted by the full-time academic staff in the department of the Clinical Technology programme, as well as appointed qualified clinical technology part-time staff from industry to further streamline admission to the programme. The APS will contribute 40%, the TUT potential assessment will contribute 20% and the interview will contribute 40% of the final score.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes.

f. *Minimum duration:*
Four years.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. *Other requirements:*
Vaccination against Hepatitis B is compulsory. Students are also encouraged to be vaccinated against COVID-19 before they can undertake clinical training at the hospitals.

i. *Practicals:*
100% attendance is compulsory for all practical classes. Students must pass the practical component of a subject to obtain admission to sit for the examination.

j. *Personal protective equipment:*
Specific safety wear is compulsory in the practical laboratories.

k. *Registration as a student clinical technologist:*
- Registration with the Health Professions Council of South Africa (HPCSA) as a student clinical technologist is compulsory.
- International students will be allowed to register at the HPCSA only as student clinical technologist; and for the duration of the relevant qualification. However, they will not be able to register with the HPCSA as a clinical technologist.

l. *Professional registration as a clinical technologist:*
Registration as a qualified clinical technologist takes place four years after registration as a student clinical technologist, provided that the candidate completes the four academic years successfully. A student can only be registered with the HPCSA as a Graduate Clinical Technologist once the minimum HPCSA required number of clinical training hours are completed.

m. *Clinical training (third and fourth year):*
The Head of the Department reserves the right to place students in some of the seven categories after consultation with industry. Students will receive guidance in their second year on the available options for the following year. Clinical training must be completed at an accredited unit. During the training period, the student is subject to the jurisdiction of the training unit. The duration of the clinical training is two years.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
CLP105P	Clinical Professional Practice I	(5)	(12)	
CPL105X	Computer Literacy	(5)	(10)	
FLF125P	Foundation Life Skills (block mode)	(5)	(2)	
HAN105P	Human Anatomy I	(5)	(18)	
HPY105P	Human Physiology I	(5)	(18)	
MAS105X	Mathematics and Statistics I	(5)	(12)	
FIRST SEMESTER				
CHS115P	Chemistry for Health Sciences I	(5)	(12)	
PHS115P	Physics for Health Sciences I	(5)	(12)	
RPL115P	Research Principles I	(5)	(6)	
SECOND SEMESTER				
MBH115P	Medical Law, Bio-Ethics and Human Rights I	(5)	(9)	
TOTAL CREDITS FOR THE FIRST YEAR:			**121**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
BAP206P	Biomedical Apparatus II	(6)	(18)	Human Anatomy I Human Physiology I
CLC206P	Clinical Science Practice II	(6)	(12)	Clinical Professional Practice I Human Anatomy I Human Physiology I
CLP206P	Clinical Professional Practice II	(6)	(12)	Clinical Professional Practice I
HAN206P	Human Anatomy II	(6)	(18)	Human Anatomy I
HPY206P	Human Physiology II	(6)	(18)	Human Physiology I
PMY206P	Pharmacology II	(6)	(18)	Chemistry for Health Sciences I Human Anatomy I Human Physiology I
PTS206P	Pathophysiology II	(6)	(18)	Human Anatomy I Human Physiology I
FIRST SEMESTER				
MBH216P	Medical Law, Bio-Ethics and Human Rights II	(6)	(9)	Medical Law, Bio-Ethics and Human Rights I
RPL216P	Research Principles II	(6)	(6)	Research Principles I
TOTAL CREDITS FOR THE SECOND YEAR:			**129**	

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CLP307P	Clinical Professional Practice III	(7)	(12)	Clinical Professional Practice II Medical Law, Bio-Ethics and Human Rights II
HAM307P	Health Care Administration and Management I	(7)	(12)	
MBH317P	Medical Law, Bio-Ethics and Human Rights III (first-semester module)	(7)	(9)	Medical Law, Bio-Ethics and Human Rights II
RPL307P	Research Principles III	(7)	(6)	Research Principles II

One of the following electives:
The prerequisite modules for all modules are: Human Anatomy II, Human Physiology II and Pathophysiology II.

CCA307P	Anatomy and Physiology III in: Critical Care	(7)	(18)
CYA307P	Anatomy and Physiology III in: Cardiology	(7)	(18)
NEA307P	Anatomy and Physiology III in: Nephrology	(7)	(18)
NRA307P	Anatomy and Physiology III in: Neurophysiology	(7)	(18)
PLA307P	Anatomy and Physiology III in: Pulmonology	(7)	(18)
RDA307P	Anatomy and Physiology III in: Reproductive Biology	(7)	(18)
VAA307P	Anatomy and Physiology III in: Cardiovascular Perfusion	(7)	(18)

One of the following electives:
The prerequisite modules for all modules are: Human Anatomy II, Human Physiology II and Pathophysiology II.

CCB307P	Biomedical Apparatus III in: Critical Care	(7)	(24)
CYB307P	Biomedical Apparatus III in: Cardiology	(7)	(24)
NEB307P	Biomedical Apparatus III in: Nephrology	(7)	(24)
NRB307P	Biomedical Apparatus III in: Neurophysiology	(7)	(24)
PLB307P	Biomedical Apparatus III in: Pulmonology	(7)	(24)
RDB307P	Biomedical Apparatus III in: Reproductive Biology	(7)	(24)
VAB307P	Biomedical Apparatus III in: Cardiovascular Perfusion	(7)	(24)

One of the following electives:
The prerequisite modules for all modules are: Biomedical Apparatus II, Clinical Professional Practice II, Clinical Science Practice II, Human Anatomy II, Human Physiology II and Pathophysiology II.

CCE307P	Clinical Science Practice III in: Critical Care	(7)	(18)
CYE307P	Clinical Science Practice III in: Cardiology	(7)	(18)
NEE307P	Clinical Science Practice III in: Nephrology	(7)	(18)

NRE307P	Clinical Science Practice III in: Neurophysiology	(7)	(18)
PLE307P	Clinical Science Practice III in: Pulmonology	(7)	(18)
RBE307P	Clinical Science Practice III in: Reproductive Biology	(7)	(18)
VAE307P	Clinical Science Practice III in: Cardiovascular Perfusion	(7)	(18)

One of the following electives:
The prerequisite modules for all modules are: Human Anatomy II, Human Physiology II and Pathophysiology II.

CCP307P	Pathophysiology III in: Critical Care	(7)	(18)
CYP307P	Pathophysiology III in: Cardiology	(7)	(18)
NEP307P	Pathophysiology III in: Nephrology	(7)	(18)
NRP307P	Pathophysiology III in: Neurophysiology	(7)	(18)
PLP307P	Pathophysiology III in: Pulmonology	(7)	(18)
RBP307P	Pathophysiology III in: Reproductive Biology	(7)	(18)
VAP307P	Pathophysiology III in: Cardiovascular Perfusion	(7)	(18)

plus one of the following first-semester electives:

CCH317P	Pharmacology III in: Critical Care	(7)	(6)	Pharmacology II
CYH317P	Pharmacology III in: Cardiology	(7)	(6)	Pharmacology II
NEH317P	Pharmacology III in: Nephrology	(7)	(6)	Pharmacology II
NRH317P	Pharmacology III in: Neurophysiology	(7)	(6)	Pharmacology II
PLH317P	Pharmacology III in: Pulmonology	(7)	(6)	Pharmacology II
RBH317P	Pharmacology III in: Reproductive Biology	(7)	(6)	Pharmacology II
VAH317P	Pharmacology III in: Cardiovascular Perfusion	(7)	(6)	Pharmacology II

TOTAL CREDITS FOR THE THIRD YEAR: **123**

FOURTH YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CDG408P	Clinical Education and Mentoring I	(8)	(12)	Clinical Professional Practice III Clinical Science Practice III *(at least one of the electives)*
CLP408P	Clinical Professional Practice IV	(8)	(12)	Clinical Professional Practice III
HAM408P	Health Care Administration and Management II	(8)	(12)	Health Care Administration and Management I
MBH418P	Medical Law, Bio-Ethics and Human Rights IV (first-semester module)	(8)	(9)	Medical Law, Bio-Ethics and Human Rights III
PTS418P	Pathophysiology IV (first-semester module)	(8)	(12)	Anatomy and Physiology III *(at least one of the electives)* Pathophysiology III *(at least one of the electives)*
RPL408P	Research Principles IV and Project	(8)	(30)	Research Principles III

plus one of the following electives:

CCB408P	Biomedical Apparatus IV in: Critical Care	(8)	(12)	Biomedical Apparatus III in: Critical Care
CYB408P	Biomedical Apparatus IV in: Cardiology	(8)	(12)	Biomedical Apparatus III in: Cardiology
NEB408P	Biomedical Apparatus IV in: Nephrology	(8)	(12)	Biomedical Apparatus III in: Nephrology
NRB408P	Biomedical Apparatus IV in: Neurophysiology	(8)	(12)	Biomedical Apparatus III in: Neurophysiology
PLB408P	Biomedical Apparatus IV in: Pulmonology	(8)	(12)	Biomedical Apparatus III in: Pulmonology
RDB408P	Biomedical Apparatus IV in: Reproductive Biology	(8)	(12)	Biomedical Apparatus III in: Reproductive Biology
VAB408P	Biomedical Apparatus IV in: Cardiovascular Perfusion	(8)	(12)	Biomedical Apparatus III in: Cardiovascular Perfusion

plus one of the following electives:

CCE408P	Clinical Science Practice IV in: Critical Care	(8)	(24)	Clinical Science Practice III in: Critical Care
CYE408P	Clinical Science Practice IV in: Cardiology	(8)	(24)	Clinical Science Practice III in: Cardiology
NEE408P	Clinical Science Practice IV in: Nephrology	(8)	(24)	Clinical Science Practice III in: Nephrology
NRE408P	Clinical Science Practice IV in: Neurophysiology	(8)	(24)	Clinical Science Practice III in: Neurophysiology
PLE408P	Clinical Science Practice IV in: Pulmonology	(8)	(24)	Clinical Science Practice III in: Pulmonology
RBE408P	Clinical Science Practice IV in: Reproductive Biology	(8)	(24)	Clinical Science Practice III in: Reproductive Biology
VAE408P	Clinical Science Practice IV in: Cardiovascular Perfusion	(8)	(24)	Clinical Science Practice III in: Cardiovascular Perfusion

TOTAL CREDITS FOR THE THIRD YEAR: **123**

TOTAL CREDITS FOR THE QUALIFICATION: **496**

3.2 BACHELOR OF HEALTH SCIENCE IN MEDICAL LABORATORY SCIENCE

BHSci (Medical Laboratory Science) - NQF Level 8 (538 credits)

Qualification type: Professional Bachelor's Degree

Qualification code: BPLS20

SAQA ID: 109456, CHE NUMBER: H/H16/E136CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL DIPLOMA AT NQF LEVEL 6:**

  Applicants who completed a relevant national diploma (at NQF Level 6) and who graduated and proceeded to work in industry can apply. Applicants should follow an articulation process in which exemption will be granted for 50% of the credits of the completed (and conferred) national diploma. Detailed information on the process to follow is available at the relevant academic department.

- **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

  Admission requirement(s):
  A Senior Certificate with a matriculation endorsement or equivalent qualification, with a D symbol at Higher Grade, or C symbol at Standard Grade for: English, Mathematics, Physical Science and Biology.

  Selection criteria:
  To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24**.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate or an equivalent qualification, with a bachelor's degree endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics, 4 for Physical Sciences or Technical Sciences and 4 for Life Sciences.

  Selection criteria:
  To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

b. *Assessment procedure(s):*
Applicants will be invited for a TUT potential assessment test and depending on the results will be invited for an interview. Structured panel interviews are conducted by the full-time academic staff in the department, as well as appointed qualified Medical Laboratory Technologist. The number of selected students is dependent on the approval and availability of student medical laboratory scientist posts at the participating and HPCSA-accredited training facilities. The APS will contribute 40%, the TUT potential assessment will contribute 20% and the interview will contribute 40% of the final score.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes.

f. *Minimum duration:*
Four years.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. *Other requirements:*
Vaccination against Hepatitis B is compulsory.

i. Practicals:
100% attendance is compulsory for all practical classes. Students must pass the practical component of a subject to obtain admission to sit for the examination.

j. Personal protective equipment:
Specific safety wear is compulsory in the practical laboratories.

k. Registration as a student medical laboratory scientist:
- Registration with the Health Professions Council of South Africa (HPCSA) as a student medical laboratory scientist is compulsory.
- International students will be allowed to register at the HPCSA only as student medical laboratory scientist; and for the duration of the relevant qualification. However, they will not be able to register with the HPCSA as a medical laboratory scientist.

l. Professional registration as a medical laboratory scientist:
Registration as a qualified medical laboratory scientist takes place four years after registration as a student *medical laboratory scientist*, provided that the candidate completes the four academic years successfully.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
CPL105X	Computer Literacy	(5)	(10)	
FLF125P	Foundation Life Skills (block module)	(5)	(2)	
HAN105P	Human Anatomy I	(5)	(18)	
HPY105P	Human Physiology I	(5)	(18)	
MAS105X	Mathematics and Statistics I	(5)	(12)	
FIRST SEMESTER				
CHI115P	Chemistry for Health Sciences	(5)	(12)	
PHS115P	Physics for Health Sciences I	(5)	(12)	
RPN115P	Research Principles I	(5)	(6)	
SECOND SEMESTER				
CBI115P	Cell Biology I	(5)	(12)	Chemistry for Health Sciences I
IMM115P	Immunology I	(5)	(12)	
MLS115P	Medical Laboratory Science I	(5)	(12)	Physics for Health Sciences I
TOTAL CREDITS FOR THE FIRST YEAR:			**136**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CCI206P	Clinical Chemistry II	(6)	(24)	Cell Biology I
CYT206P	Cytology II	(6)	(18)	Human Anatomy I Human Physiology I
HTY206P	Haematology II	(6)	(24)	Human Anatomy I Human Physiology I
PTS206P	Pathophysiology II	(6)	(18)	Human Anatomy I Human Physiology I

FIRST SEMESTER

MBY216P	Microbiology I	(6)	(12)	Immunology I
MLS216P	Medical Laboratory Science II	(6)	(6)	Medical Laboratory Science I

SECOND SEMESTER

HST216P	Histology II	(6)	(12)	Human Anatomy I Human Physiology I
IHM216P	Immunohaematology II	(6)	(12)	Immunology I
MMI216P	Medical Microbiology II	(6)	(12)	Microbiology I
RPN216P	Research Principles II	(6)	(6)	Research Principles I Mathematics and Statistics I

TOTAL CREDITS FOR THE SECOND YEAR: **144**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
RPN307P	Research Principles III	(7)	(6)	Research Principles II

FIRST SEMESTER

CCI317P	Clinical Chemistry III	(7)	(12)	Clinical Chemistry II
HTY317P	Haematology III	(7)	(12)	Haematology II Immunohaematology II
ICH317P	Integrated Cytology and Histology III	(7)	(12)	Cytology II Histology II
IPY317P	Integrated Pathophysiology III	(7)	(12)	Pathophysiology II
MMI317P	Medical Microbiology III	(7)	(12)	Medical Microbiology II

SECOND SEMESTER

CLR317P	Clinical Laboratory Practice III	(7)	(60)	Clinical Chemistry III Computer Literacy Haematology III Integrated Cytology and Histology III Integrated Pathophysiology III Medical Laboratory Science II Medical Microbiology III

TOTAL CREDITS FOR THE THIRD YEAR: **126**

FOURTH YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
DLG418P	Diagnostic Laboratory Management IV (first-semester module)	(8)	(12)	Clinical Laboratory Practice III
RPN408P	Research Principles IV and Project	(8)	(30)	Research Principles III
	plus one of the following electives:			
CCI408P	Clinical Laboratory Practice IV in: Clinical Chemistry	(8)	(90)	Clinical Laboratory Practice III Research Principles III

CGE408P	Clinical Laboratory Practice IV in: Cytogenetics	(8)	(90)	Clinical Laboratory Practice III Research Principles III
CPH408P	Clinical Laboratory Practice IV in: Clinical Pathology	(8)	(90)	Clinical Laboratory Practice III Research Principles III
CYT408P	Clinical Laboratory Practice IV in: Cytology	(8)	(90)	Clinical Laboratory Practice III Research Principles III
HST408P	Clinical Laboratory Practice IV in: Histology	(8)	(90)	Clinical Laboratory Practice III Research Principles III
HTY408P	Clinical Laboratory Practice IV in: Haematology	(8)	(90)	Clinical Laboratory Practice III Research Principles III
IHM408P	Clinical Laboratory Practice IV in: Immunohaematology	(8)	(90)	Clinical Laboratory Practice III Research Principles III
IMM408P	Clinical Laboratory Practice IV in: Immunology	(8)	(90)	Clinical Laboratory Practice III Research Principles III
MMI408P	Clinical Laboratory Practice IV in: Medical Microbiology	(8)	(90)	Clinical Laboratory Practice III Research Principles III
VIR408P	Clinical Laboratory Practice IV in: Virology	(8)	(90)	Clinical Laboratory Practice III Research Principles III

TOTAL CREDITS FOR THE FOURTH YEAR: **132**

TOTAL CREDITS FOR THE QUALIFICATION: **538**

3.3 BACHELOR OF HEALTH SCIENCE IN VETERINARY TECHNOLOGY

BHSci (Veterinary Technology) - NQF Level 8 (502 credits)

Qualification type: Professional Bachelor's Degree

Qualification code: BPVT20

SAQA ID: 110813, CHE NUMBER: H/H16/E173CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL DIPLOMA AT NQF LEVEL 6:**

Applicants who completed a relevant national diploma (at NQF Level 6) and who graduated and proceeded to work in industry can apply. Applicants should follow an articulation process in which exemption will be granted for 50% of the credits of the completed (and conferred) national diploma. Detailed information on the process to follow is available at the relevant academic department.

- **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

Admission requirement(s):
A Senior Certificate with a matriculation endorsement or equivalent qualification, with a D symbol at Higher Grade, or C symbol at Standard Grade for: English, Mathematics, Physical Science and Biology or Agricultural Sciences.

Selection criteria:
To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24**.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate or an equivalent qualification, with a bachelor's degree endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics, 4 for Physical Sciences or Technical Sciences and 4 for Life Sciences or a 4 for Agricultural Sciences.

  Selection criteria:
  To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

b. *Assessment procedure(s):*
Applicants will be invited for a TUT potential assessment test and depending on the results will be invited for an interview. The APS will contribute 40%, the TUT potential assessment will contribute 20% and the interview will contribute 40% of the final score.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes.

f. *Minimum duration:*
Four years.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. *Other requirements:*
Students will be required to be vaccinated as required in the veterinary field.

i. *Practicals:*
100% attendance is compulsory for all practical classes. Students must pass the practical component of a subject to obtain admission to sit for the examination.

j. *Personal protective equipment:*
Specific safety wear is compulsory in the practical laboratories.

k. *Registration as a veterinary technologist:*
Registration in the first year with the South African Veterinary Council (SAVC) as a veterinary technologist is compulsory. Registration must be renewed each year.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
CPL105X	Computer Literacy	(5)	(10)	

CVT105P	Introduction to Clinical Veterinary Technology I	(5)	(24)
FLF125P	Foundation Life Skills (block module)	(5)	(2)
MAS105X	Mathematics and Statistics I	(5)	(12)

FIRST SEMESTER

ANM115P	Animal Anatomy I	(5)	(12)
ANP115P	Animal Physiology I	(5)	(12)
CHC115P	Chemistry for Health Science I	(5)	(12)
PHS115P	Physics for Health Sciences I	(5)	(12)

SECOND SEMESTER

MBL115P	Microbiology I	(5)	(12)
RPV115P	Research Principles I	(5)	(6)

TOTAL CREDITS FOR THE FIRST YEAR: **124**

SECOND YEAR

Upon first registration, all modules must be taken concurrently. In the event of failing, non-completion and/or de-registration any of the modules in the second year, the following rule will apply:

Clinical Veterinary Technology II (CVT206P) and all remainder semester modules should be taken concurrently, or all semester modules must be passed before a student will be permitted to register for Clinical Veterinary Technology II (CVT206P).

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CVT206P	Clinical Veterinary Technology II	(6)	(42)	Animal Anatomy I Animal Physiology I Chemistry for Health Science I Introduction to Clinical Veterinary Technology I Mathematics and Statistics I Microbiology I Physics for Health Sciences I

FIRST SEMESTER

BCH216P	Biochemistry II	(6)	(12)	Chemistry for Health Science I
IMM216P	Immunology II	(6)	(12)	Animal Anatomy I Animal Physiology I
MBL216P	Microbiology II	(6)	(12)	Microbiology I
RPV216P	Research Principles II	(6)	(6)	Research Principles I
VHT216P	Veterinary Haematology II	(6)	(12)	Animal Anatomy I Animal Physiology I

SECOND SEMESTER

HST216P	Histology II	(6)	(12)	Animal Anatomy I Animal Physiology I
SER216P	Serology II	(6)	(12)	Immunology II

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

* Key to asterisks:
All second-year modules (except Research Principles II) should be completed before a student can register for the module.

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
EMY307P	Clinical Veterinary Technology III in Entomology*	(7)	(18)	
HMY307P	Clinical Veterinary Technology III in Helminthology*	(7)	(18)	
MCB307P	Clinical Veterinary Technology III in Molecular Biology*	(7)	(24)	
PZY307P	Clinical Veterinary Technology III in Protozoology*	(7)	(18)	
RPV307P	Research Principles III	(7)	(6)	Research Principles II
VLY307P	Clinical Veterinary Technology III in Virology*	(7)	(18)	
VRM307P	Clinical Veterinary Technology III in Veterinary Microbiology*	(7)	(18)	

TOTAL CREDITS FOR THE THIRD YEAR: **120**

FOURTH YEAR

* Key to asterisks:
All third-year modules (except Research Principles III) should be completed before a student can register for the module.

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
BTY408P	Clinical Veterinary Technology IV in Bacteriology*	(8)	(24)	
LBT418P	Laboratory Management IV* (first-semester module)	(8)	(12)	
MCB408P	Clinical Veterinary Technology IV in Molecular Biology*	(8)	(24)	
PAR408P	Clinical Veterinary Technology IV in Parasitology*	(8)	(24)	
RPV408P	Research Principles IV and Project*	(8)	(30)	Research Principles III
VLY408P	Clinical Veterinary Technology IV in Virology*	(8)	(24)	

TOTAL CREDITS FOR THE FOURTH YEAR: **138**

TOTAL CREDITS FOR THE QUALIFICATION: **502**

3.4 BACHELOR OF RADIOGRAPHY IN DIAGNOSTIC

BRad (Diagnostic) - NQF Level 8 (550 credits)

Qualification type: Professional Bachelor's Degree

Qualification code: BPRA20

SAQA ID: 112055, CHE NUMBER: H/H16/E135CAN

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s) and selection criteria:*

Acceptance is subject to availability of clinical student posts at the different co-operative clinical training facilities, accredited by the Health Professions Council of South Africa (HPCSA) as well as capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL DIPLOMA AT NQF LEVEL 6:**

Applicants who completed a relevant national diploma (at NQF Level 6) and who graduated and proceeded to work in industry can apply. Applicants should follow an articulation process in which exemption will be granted for 50% of the credits of the completed (and conferred) national diploma. Detailed information on the process to follow is available at the relevant academic department.

- **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

Admission requirement(s):
A Senior Certificate with a matriculation endorsement or equivalent qualification, with an E symbol at Higher Grade or a D symbol at Standard Grade for English, Mathematics, Physical Science and Biology or Physiology.

Selection criteria:
To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24**.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate or an equivalent qualification, with a bachelor's degree endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics, 4 for Physical Sciences or Technical Sciences and 4 for Life Sciences.

Selection criteria:
To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

b. *Assessment procedure(s):*
Applicants will be invited for a TUT potential assessment test and depending on the results will be invited for an interview. The APS will contribute 60%, the TUT potential assessment will contribute 20% and the interview will contribute 20% of the final score.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes.

f. *Minimum duration:*
Four years.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. *Other requirements:*
Immunisation against Hepatitis B is compulsory. A valid first-aid certificate is required. The University will arrange a first-aid programme. International students will be assessed by the department to determine enrolment for this qualification.

i. *Special qualification rules:*
Special qualification rules apply, and students who register for this qualification will receive the rules with their letter of acceptance. It is the students' own responsibility to familiarise themselves with those rules.

j. *Professional registration:*
Compulsory once-off registration with the Health Professions Council of South Africa (HPCSA) as a student radiographer.

k. *Practicals:*
100% attendance is compulsory for all practical classes. Students must pass the practical component of a subject to obtain admission to sit for the examination.

l. *Personal protective equipment:*
Specific safety wear is compulsory in the practical laboratories.

m. *Community service:*
As stipulated by the National Department of Health, students must render compulsory community service (twelve months) on completion of the basic learning programme (four years).

n. *Compulsory Workplace-based learning:*
Compulsory Workplace-based learning will take place from year two to year four at HPCSA-accredited clinical training facilities.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
CPL105X	Computer Literacy	(5)	(10)	
CRP105P	Clinical Radiographic Practice I	(5)	(12)	
FLF125P	Foundation Life Skills (block module)	(5)	(2)	
HAN105P	Human Anatomy I	(5)	(18)	
HPY105P	Human Physiology I	(5)	(18)	
MAS105X	Mathematics and Statistics I	(5)	(12)	
RDI105P	Radiographic Imaging I	(5)	(12)	
RPT105P	Radiographic Practice I	(5)	(12)	

FIRST SEMESTER

CHS115P	Chemistry for Health Sciences I	(5)	(12)
PHS115P	Physics for Health Sciences I	(5)	(12)

SECOND SEMESTER

RPH115P	Research Principles I	(5)	(6)

TOTAL CREDITS FOR THE FIRST YEAR: **136**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CRP206P	Clinical Radiographic Practice II	(6)	(24)	Chemistry for Health Sciences I Clinical Radiographic Practice I Physics for Health Sciences I Radiographic Imaging I Radiographic Practice I
HAN206P	Human Anatomy II	(6)	(18)	Human Anatomy I
HPY206P	Human Physiology II	(6)	(18)	Human Physiology I
RDI206P	Radiographic Imaging II	(6)	(18)	Physics for Health Sciences I Radiographic Imaging I
RDQ206P	Radiation Physics, Protection, and Diagnostic Imaging Equipment II	(6)	(24)	Physics for Health Sciences I Radiographic Imaging I
RPT206P	Radiographic Practice II	(6)	(24)	Chemistry for Health Sciences I Clinical Radiographic Practice I Radiographic Imaging I Radiographic Practice I
RPY206P	Radiographic Pathology II	(6)	(18)	Human Anatomy I Human Physiology I

FIRST SEMESTER

RPH216P	Research Principles II	(6)	(6)	Research Principles I

TOTAL CREDITS FOR THE SECOND YEAR: **150**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CRP307P	Clinical Radiographic Practice III	(7)	(24)	Clinical Radiographic Practice II Human Anatomy II Human Physiology II Radiation Physics, Protection, and Diagnostic Imaging Equipment II Radiographic Imaging II Radiographic Pathology II Radiographic Practice II
HAM307P	Health Care Administration and Management I	(7)	(12)	
RDI307P	Radiographic Imaging III	(7)	(24)	Radiographic Imaging II Radiation Physics, Protection, and Diagnostic Imaging Equipment II
RPH307P	Research Principles III	(7)	(6)	Research Principles II

RPT307P	Radiographic Practice III	(7)	(24)	Clinical Radiographic Practice II Human Anatomy II Human Physiology II Radiographic Imaging II Radiographic Pathology II Radiographic Practice II
RPY307P	Radiographic Pathology III	(7)	(12)	Clinical Radiographic Practice II Human Anatomy II Human Physiology II Radiographic Pathology II Radiographic Imaging II Radiographic Practice II
SAP307P	Sectional Anatomy and Pattern Recognition III	(7)	(12)	Clinical Radiographic Practice II Human Anatomy II Human Physiology II Radiographic Imaging II Radiographic Pathology II Radiographic Practice II
SRI307P	Specialised Radiographic Imaging Equipment III	(7)	(18)	Radiation Physics, Protection, and Diagnostic Imaging Equipment II
TOTAL CREDITS FOR THE THIRD YEAR:			**132**	

FOURTH YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CRP408P	Clinical Radiographic Practice IV	(8)	(12)	Clinical Radiographic Practice III Radiographic Imaging III Radiographic Pathology III Radiographic Practice III Sectional Anatomy and Pattern Recognition III Specialised Radiographic Imaging Equipment III
RDI408P	Radiographic Imaging IV	(8)	(12)	Radiographic Imaging III
RPH408P	Research Principles IV and Project	(8)	(30)	Research Principles III
RPT408P	Radiographic Practice IV	(8)	(24)	Clinical Radiographic Practice III Radiographic Practice III
SAP408P	Sectional Anatomy and Pattern Recognition IV	(8)	(12)	Radiographic Pathology III Sectional Anatomy and Pattern Recognition III
	plus one of the following electives:			
CRM408P	Clinical Radiographic Education and Mentoring	(8)	(18)	Clinical Radiographic Practice III Radiographic Practice III
MRI408P	Magnetic Resonance Imaging (MRI)	(8)	(18)	Radiographic Pathology III Sectional Anatomy and Pattern Recognition III Specialised Radiographic Imaging Equipment III
	plus two of the following electives:			
FRG408P	Forensic Radiography	(8)	(12)	Clinical Radiographic Practice III Radiographic Practice III

HAM408P	Health Care Administration and Management II	(8)	(12)	Health Care Administration and Management I
MGY408P	Mammography	(8)	(12)	Radiographic Pathology III Sectional Anatomy and Pattern Recognition III Specialised Radiographic Imaging Equipment III

TOTAL CREDITS FOR THE FOURTH YEAR: **132**

TOTAL CREDITS FOR THE QUALIFICATION: **550**

3.5 MASTER OF HEALTH SCIENCES

MHealthSci - NQF Level 9 (180 credits)

Qualification code: MDHS19

(Specialisation codes for admission and registration: MDCL19 / MDLS19 / MDRA19 / MDVT19)

SAQA ID: 96890, CHE NUMBER: H16/11150/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):

A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor's degree, **or** a baccalaureus technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a relevant national diploma at (NQF Level 6) will be required to complete 50% of the credits of a relevant professional bachelor's degree. Detailed information on the process to follow is available at the relevant academic department.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:

- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. Selection criteria:

Selection based on a personal interview with a departmental selection panel may be required in certain programmes. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Post-graduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of one year and a maximum of three years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Health Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following options, which are offered by this Department:

CODE	MODULE	NQF-L	CREDIT
Option 1: MDCL19			
CLT109M	Dissertation: Clinical Technology	(9)	(180)
CLT109R	Dissertation: Clinical Technology (re-registration)	(9)	(0)
CLT119R	Dissertation: Clinical Technology (re-registration) (semester module)	(9)	(0)
Option 2: MDLS19			
MLS109M	Dissertation: Medical Laboratory Sciences	(9)	(180)
MLS109R	Dissertation: Medical Laboratory Sciences (re-registration)	(9)	(0)
MLS119R	Dissertation: Medical Laboratory Sciences (re-registration) (semester module)	(9)	(0)
Option 3: MDRA19			
RAD109M	Dissertation: Radiography in Diagnostic	(9)	(180)
RAD109R	Dissertation: Radiography in Diagnostic (re-registration)	(9)	(0)
RAD119R	Dissertation: Radiography in Diagnostic (re-registration) (semester module)	(9)	(0)
Option 4: MDVT19			
VTE109M	Dissertation: Veterinary Technology	(9)	(180)
VTE109R	Dissertation: Veterinary Technology (re-registration)	(9)	(0)
VTE119R	Dissertation: Veterinary Technology (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

3.6 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation codes for admission and registration: PHCL17 / PHLS17 / PHRA17 / PHVT21)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of two years and a maximum of four years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation codes:

CODE	MODULE	NQF-L	CREDIT
Option 1: PHCL17			
CT1010O	Thesis: Clinical Technology	(10)	(360)
CT1010R	Thesis: Clinical Technology (re-registration)	(10)	(0)

CT1110R	Thesis: Clinical Technology (re-registration) (semester module)	(10)	(0)

Option 2: PHLS17

ML1010O	Thesis: Medical Laboratory Sciences	(10)	(360)
ML1010R	Thesis: Medical Laboratory Sciences (re-registration)	(10)	(0)
ML1110R	Thesis: Medical Laboratory Sciences (re-registration) (semester module)	(10)	(0)

Option 3: PHRA17

RA1010O	Thesis: Radiography	(10)	(360)
RA1010R	Thesis: Radiography (re-registration)	(10)	(0)
RA1110R	Thesis: Radiography (re-registration) (semester module)	(10)	(0)

Option 4: PHVT21

VT1010O	Thesis: Veterinary Technology	(10)	(360)
VT1010R	Thesis: Veterinary Technology (re-registration)	(10)	(0)
VT1010R	Thesis: Veterinary Technology (re-registration) (semester module)	(10)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **360**

4. DEPARTMENT OF BIOTECHNOLOGY AND FOOD TECHNOLOGY

4.1 DIPLOMA IN BIOTECHNOLOGY

Dip (Biotechnology) - NQF Level 6 (360 credits)

Qualification code: DPBI19

SAQA ID: 100977, CHE NUMBER: H16/14268/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with an E symbol at Higher Grade or a D symbol at Standard Grade for English, Mathematics and Physical Science.

Recommended subject(s):
Biology.

Assessment procedure:
Applicants who meet the minimum requirements will be invited to submit a portfolio and to write an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test will contribute 20%.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics, 4 for Physical Sciences or Technical Sciences and 3 for Life Sciences.

Recommended subject(s):
None.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).

Assessment procedure:
Applicants with a score of 24 or more will be automatically accepted. Applicants with a score of 21 to 23 will be considered for admission, and will be invited to write an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test will contribute 20%.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day classes.

e. *Minimum duration:*
Three years.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

g. *WIL in Biotechnology I:*
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
CHM105X	Chemistry I	(5)	(24)	
CPL105X	Computer Literacy	(5)	(10)	
GMA105D	General Mathematics I	(5)	(24)	
GPH105D	General Physics I	(5)	(24)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LFI125X	Life Skills I (block module)	(5)	(2)	
MIB105D	Microbiology I	(5)	(24)	
TOTAL CREDITS FOR THE FIRST YEAR:			**120**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
BPD206D	Biotechnology Professional Development II	(6)	(24)	Microbiology I
MLB206D	Molecular Biology II	(6)	(15)	Microbiology I
FIRST SEMESTER				
BAC216D	Bioanalytical Chemistry II	(6)	(12)	Chemistry I
BCH216D	Biochemistry II	(6)	(12)	Chemistry I
PEM216D	Process Technology and Management I	(6)	(12)	General Mathematics I General Physics I
SECOND SEMESTER				
BCT216D	Biotechnology Cultivation Technology II	(6)	(18)	Microbiology I
MBC216D	Microbial Biochemistry II	(6)	(12)	Biochemistry II
MBT216D	Microbial Taxonomy II	(6)	(15)	Microbiology I
TOTAL CREDITS FOR THE SECOND YEAR:			**120**	

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
BAC316D	Bioanalytical Chemistry III	(6)	(12)	Bioanalytical Chemistry II
FOM316D	Food Microbiology III	(6)	(15)	Microbial Taxonomy II Molecular Biology II
MBP316D	Microbial Bioprocessing III	(6)	(18)	Biotechnology Cultivation Technology II
MMB316D	Medical Microbiology III	(6)	(15)	Microbial Biochemistry II Microbial Taxonomy II Molecular Biology II
TOTAL CREDITS FOR THE SEMESTER:			60	

SECOND SEMESTER
On completion of all the modules. If a student has one outstanding module, that particular case will be reviewed and permission might be granted in collaboration with the specific employer.

WBT316D	WIL in Biotechnology I (first- or second-semester module)	(6)	(60)
TOTAL CREDITS FOR THE SEMESTER:			60
TOTAL CREDITS FOR THE THIRD YEAR:			**120**
TOTAL CREDITS FOR THE QUALIFICATION:			**360**

4.2 ADVANCED DIPLOMA IN BIOTECHNOLOGY

AdvDip (Biotechnology) - NQF Level 7 (120 credits)
Qualification code: ADBI20
SAQA ID: 101555, CHE NUMBER: H/H16/E050CAN

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
A Diploma in Biotechnology, **or** a National Diploma: Biotechnology, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Block-mode classes.

f. Minimum duration:
Two years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

Students who register for full-time block-mode classes should register for all modules in one academic year.

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT
FIRST SEMESTER			
EBT117V	Entrepreneurial Skills	(7)	(12)
QSM117V	Quality and Safety Management Systems	(7)	(12)
SECOND SEMESTER			
EBI117V	Environmental Biotechnology	(7)	(12)
IBI117V	Industrial Biotechnology	(7)	(12)
TOTAL CREDITS FOR THE FIRST YEAR:			**48**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT
MLB107V	Advanced Molecular Biology	(7)	(48)
FIRST SEMESTER			
IPG117V	Introduction to Postgraduate Research	(7)	(12)
MBI117V	Medical Biotechnology	(7)	(12)
SECOND SEMESTER (if not completed in the first year)			
EBI117V	Environmental Biotechnology	(7)	(12)
IBI117V	Industrial Biotechnology	(7)	(12)
TOTAL CREDITS FOR THE SECOND YEAR:			**72**
TOTAL CREDITS FOR THE QUALITFICATION:			**120**

4.3 POSTGRADUATE DIPLOMA IN BIOTECHNOLOGY

PGDip (Biotechnology) - NQF Level 8 (120 credits)

Qualification code: PDBI22

SAQA ID: 101898, CHE NUMBER: H/H16/E052CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
An Advanced Diploma in Biotechnology, **or** a Baccalaureus Technologiae: Biotechnology, **or** a Bachelor's degree in Biotechnology or Microbiology, **or** an equivalent qualification at NQF Level 7 with 120 credits. Preference will be given to applicants with an average of 60% or more in the previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the academic progress in the previous qualification and/or work experience.

All completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes offered over two years.

f. Minimum duration:
A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Postgraduate Research Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

ATTENDANCE 2024

CODE	MODULE	NQF-L	CREDIT
PBI108G	Postgraduate Research Project	(8)	(24)

PBI118R	Postgraduate Research Project (re-registration) (first-semester module, see paragraph h)	(8)	(0)

FIRST SEMESTER

BII118G	Bioinformatics	(8)	(18)

SECOND SEMESTER

BIE118G	Bioethics	(8)	(18)

TOTAL CREDITS FOR THE YEAR: **60**

ATTENDANCE 2025

CODE	MODULE	NQF-L	CREDIT
AMI108G	Applied Molecular Biology	(8)	(36)

FIRST SEMESTER

BIM118G	Biometrics	(8)	(12)
RET118G	Research Methodology and Ethics	(8)	(12)

TOTAL CREDITS FOR THE YEAR: **60**

TOTAL CREDITS FOR QUALIFICATION: **120**

4.4 DIPLOMA IN FOOD TECHNOLOGY

Dip (Food Technology) - NQF Level 6 (360 credits)

Qualification code: DPFT19

SAQA ID: 100978, CHE NUMBER: H16/14269/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with an E symbol at Higher Grade or a D symbol at Standard Grade for English, Mathematics and Physical Science.

Recommended subject(s):
Biology.

Assessment procedure:
Applicants who meet the minimum requirements will be invited to submit a portfolio and to write an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test will contribute 20%.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics, 4 for Physical Sciences or Technical Sciences and 3 for Life Sciences.

  Recommended subject(s):
  None.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).

  Assessment procedure:
  Applicants with a score of 24 or more will be automatically accepted. Applicants with a score of 21 to 23 will be considered for admission, and will be invited to write an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test will contribute 20%.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Student's Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day classes.

e. *Minimum duration:*
Three years.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

g. *WIL in Food Technology I:*
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
CHM105X	Chemistry I	(5)	(24)	
CPL105X	Computer Literacy	(5)	(10)	
GMA105D	General Mathematics I	(5)	(24)	
GPH105D	General Physics I	(5)	(24)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LFI125X	Life Skills I (block module)	(5)	(2)	

MIB105D	Microbiology I	(5)	(24)

FIRST SEMESTER

FTP115D	Food Technology Preservation I	(5)	(12)

TOTAL CREDITS FOR THE FIRST YEAR: **132**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FPD206D	Food Product Development I	(6)	(24)	Chemistry I Food Technology Preservation I Microbiology I
FTC206D	Food Technology Commodities II	(6)	(24)	Food Technology Preservation I Microbiology I
MLB206D	Molecular Biology II	(6)	(15)	Microbiology I

FIRST SEMESTER

BAC216D	Bioanalytical Chemistry II	(6)	(12)	Chemistry I
BCH216D	Biochemistry II	(6)	(12)	Chemistry I

SECOND SEMESTER

FCM216D	Food Chemistry II	(6)	(12)	Bioanalytical Chemistry II Biochemistry II Chemistry I
MBT216D	Microbial Taxonomy II	(6)	(15)	Microbiology I

TOTAL CREDITS FOR THE SECOND YEAR: **114**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)

FIRST SEMESTER

FIM316D	Food Industry Management I	(6)	(12)	
FOM316D	Food Microbiology III	(6)	(15)	Microbial Taxonomy II Molecular Biology II
FPE316D	Food Process Engineering I	(6)	(12)	General Mathematics I General Physics I
FQA316D	Food Quality Assurance I	(6)	(15)	Food Technology Commodities II Microbiology I

TOTAL CREDITS FOR THE SEMESTER: 60

SECOND SEMESTER
On completion of all the modules. If a student has one outstanding module, that particular case will be reviewed and permission might be granted in collaboration with the specific employer.

WFT316D	WIL in Food Technology I (first- or second-semester module)	(6)	(60)

TOTAL CREDITS FOR THE SEMESTER: 60

TOTAL CREDITS FOR THE THIRD YEAR: **114**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

4.5 ADVANCED DIPLOMA IN FOOD TECHNOLOGY

AdvDip (Food Technology) - NQF Level 7 (120 credits)

Qualification code: ADFT20

SAQA ID: 101897, CHE NUMBER: H/H16/E051CAN

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
A Diploma in Food Technology, **or** a National Diploma: Food Technology, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits. Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Block-mode classes.

f. *Minimum duration:*
Two years.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

Students who register for full-time block-mode classes should register for all modules in one academic year.

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT
AFT107V	Advanced Food Technologies (also offered in the second-year)	(7)	(24)
FOO107V	Food Components (also offered in the second-year)	(7)	(24)

FIRST SEMESTER

EBT117V	Entrepreneurial Skills	(7)	(12)
QSM117V	Quality and Safety Management Systems (first-semester module)	(7)	(12)

SECOND SEMESTER

FPR117V	Food Projects and Risk Management	(7)	(18)

TOTAL CREDITS FOR THE FIRST YEAR: **90**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT
SECOND SEMESTER			
FSA117V	Food Safety Assurance	(7)	(18)
FIRST SEMESTER			
IRF117V	Introduction to Research	(7)	(12)

TOTAL CREDITS FOR THE SECOND YEAR: **30**

TOTAL CREDITS FOR THE QUALIFICATION: **120**

4.6 POSTGRADUATE DIPLOMA IN FOOD TECHNOLOGY

PGDip (Food Technology) - NQF Level 8 (120 credits)
Qualification code: PDFT22
SAQA ID: 110645, CHE NUMBER: H/H16/E053CAN

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
An Advanced Diploma in Food Technology, **or** a Baccalaureus Technologiae: Food Technology, **or** a Bachelor's degree in Food Technology or Food Science, **or** an equivalent qualification at NQF Level 7 with 120 credits. Preference will be given to applicants with an average of 60% or more in the previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Prospective students will be evaluated based on the academic progress in the previous qualification and/or work experience.

All completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes offered over two years.

f. Minimum duration:
A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Research/Product Development Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

ATTENDANCE 2024

CODE	MODULE	NQF-L	CREDIT
RFT108G	Research/Product Development Project	(8)	(24)
RFT118R	Research/Product Development Project (re-registration) (first-semester module, see paragraph h)	(8)	(0)
TOTAL CREDITS FOR THE YEAR:			**24**

ATTENDANCE 2025

CODE	MODULE	NQF-L	CREDIT
AFE108G	Applied Food Technologies	(8)	(36)
FOA108G	Food Analyses	(8)	(36)
FIRST SEMESTER			
BIM118G	Biometrics	(8)	(12)
PRF118G	Research Methodology and Ethics	(8)	(12)
TOTAL CREDITS FOR THE YEAR:			**96**
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

4.7 MASTER OF AGRICULTURAL SCIENCE

MAgricSci - NQF Level 9 (180 credits)

Qualification code: MDAS19

(Specialisation code for admission and registration: MDFT19)

SAQA ID: 96889, CHE NUMBER: H16/2422/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
A Postgraduate Diploma in Agriculture, **or** a Baccalaureus Technologiae: Agriculture, **or** a Bachelor Honours degree in Agriculture from a South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. Selection criteria:
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of one year and a maximum of three years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Agricultural Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
FTE109M	Dissertation: Food Technology	(9)	(180)
FTE109R	Dissertation: Food Technology (re-registration)	(9)	(0)
FTE119R	Dissertation: Food Technology (re-registration) (semester module)	(9)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **180**

4.8 MASTER OF APPLIED SCIENCES

MAppSci - NQF Level 9 (180 credits)

Qualification code: MDAP19

(Specialisation codes for admission and registration: MDBI19 / MDFO19)

SAQA ID: 102024, CHE NUMBERS: H16/10784/HEQSF, H16/2442/HEQSF, H16/10792/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor's degree, **or** a baccalaureus technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. *Selection criteria:*
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of one year and a maximum of three years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Applied Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: MDBI19			
BTE109M	Dissertation: Biotechnology	(9)	(180)
BTE109R	Dissertation: Biotechnology (re-registration)	(9)	(0)
BTE119R	Dissertation: Biotechnology (re-registration) (semester module)	(9)	(0)
Option 2: MDFO19			
FOT109M	Dissertation: Food Technology	(9)	(180)
FOT109R	Dissertation: Food Technology (re-registration)	(9)	(0)
FOT119R	Dissertation: Food Technology (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

4.9 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation codes for admission and registration: PHBI17 / PHFT17)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of two years and a maximum of four years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: PHBI17			
BT1010O	Thesis: Biotechnology	(10)	(360)
BT1010R	Thesis: Biotechnology (re-registration)	(10)	(0)
BT1110R	Thesis: Biotechnology (re-registration) (semester module)	(10)	(0)
Option 2: PHFT17			
FT1010O	Thesis: Food Technology	(10)	(360)
FT1010R	Thesis: Food Technology (re-registration)	(10)	(0)
FT1110R	Thesis: Food Technology (re-registration) (semester module)	(10)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**360**

5. DEPARTMENT OF CHEMISTRY

5.1 BACHELOR OF SCIENCE IN INDUSTRIAL CHEMISTRY

BSc (Industrial Chemistry) - NQF Level 8 (480 credits)

Qualification type: Professional Bachelor's Degree

Qualification code: BPIY20

SAQA ID: 111429, CHE NUMBER: H/H16/E114CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

- **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

  Admission requirement(s):
  A Senior Certificate with a matriculation endorsement or an equivalent qualification, with a C symbol at Higher Grade or a B symbol at Standard Grade for English, Mathematics, and Physical Science.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate or an equivalent qualification, with a bachelor's degree endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 5 for Mathematics and 5 for Physical Sciences.

  Selection criteria:
  To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

b. Assessment procedure(s):
No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full. All completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes.

f. Minimum duration:
Four years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Industrial Chemistry Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
ALI125X	Academic Literacy (block module)	(5)	(2)	
CHM105X	Chemistry I	(5)	(24)	
COE105X	Communication for Academic Purpose	(5)	(10)	
CPL105X	Computer Literacy	(5)	(10)	
LFS125X	Life Skills (block module)	(5)	(2)	
MAT105X	Mathematics I	(5)	(24)	
PHI105X	Physics I	(5)	(24)	
TOTAL CREDITS FOR THE FIRST YEAR:			**96**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
MAT206P	Mathematics II	(6)	(24)	Mathematics I
FIRST SEMESTER				
CAL216P	Chemical Process Industries II	(6)	(18)	Chemistry I
INA216X	Inorganic Chemistry IIA	(6)	(12)	Chemistry I
OCA216X	Organic Chemistry IIA	(6)	(12)	Chemistry I
PCA216X	Physical Chemistry IIA	(6)	(12)	Chemistry I Mathematics I
SECOND SEMESTER				
INB216X	Inorganic Chemistry IIB	(6)	(18)	Inorganic Chemistry IIA
OCB216X	Organic Chemistry IIB	(6)	(18)	Organic Chemistry IIA
PCB216X	Physical Chemistry IIB	(6)	(18)	Physical Chemistry IIA
TOTAL CREDITS FOR THE SECOND YEAR:			**132**	

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
ESY307P	Environmental Science and Technology III	(7)	(24)	Inorganic Chemistry IIA Organic Chemistry IIA Physical Chemistry IIA

FIRST SEMESTER

ISY317P	Industrial Synthesis III	(7)	(18)	Chemical Process Industries II Inorganic Chemistry IIA Mathematics II Organic Chemistry IIA Physical Chemistry IIA
MSA317P	Material Science IIIA	(7)	(12)	Inorganic Chemistry IIA Mathematics II Organic Chemistry IIA Physical Chemistry IIA
PCH317P	Physical Chemistry III	(7)	(12)	Mathematics II Physical Chemistry IIB
SRS317P	Separation Science III	(7)	(18)	Inorganic Chemistry IIB Organic Chemistry IIB Physical Chemistry IIB

SECOND SEMESTER

MSB317P	Material Science IIIB	(7)	(12)	Material Science IIIA Physical Chemistry IIB
MSP317P	Molecular Spectroscopy III	(7)	(18)	Inorganic Chemistry IIB Mathematics II Organic Chemistry IIB Physical Chemistry IIA
PCL317P	Process Control III	(7)	(18)	Inorganic Chemistry IIB Mathematics II Organic Chemistry IIB Physical Chemistry IIA

TOTAL CREDITS FOR THE THIRD YEAR: **132**

FOURTH YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
ISY418P	Industrial Synthesis IV	(8)	(18)	Industrial Synthesis III
MSP418P	Molecular Spectroscopy IV	(8)	(18)	Molecular Spectroscopy III Physical Chemistry IIB
PCH418P	Physical Chemistry IV	(8)	(12)	Physical Chemistry III
RIY418P	Research Methodology IV (after completion of all first-, second- and third-year modules)	(8)	(12)	
TOTAL CREDITS FOR THE SEMESTER:			60	
SECOND SEMESTER				
ICC418P	Industrial Chemistry Practice IV (after completion of all first-, second- and third-year modules)	(8)	(30)	
ICR418P	Industrial Chemistry Project IV	(8)	(30)	Industrial Synthesis IV Material Science IIIB Molecular Spectroscopy IV Physical Chemistry IV Research Methodology IV

ICR418R	Industrial Chemistry Project IV (re-registration) (first-semester module, see paragraph h)	(8)	(0)

TOTAL CREDITS FOR THE SEMESTER: 60

TOTAL CREDITS FOR THE FOURTH YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **480**

5.2 DIPLOMA IN ANALYTICAL CHEMISTRY

Dip (Analytical Chemistry) - NQF Level 6 (360 credits)

Qualification code: DPAC19

SAQA ID: 100979, CHE NUMBER: H16/14303/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with a D symbol at Higher Grade or a C symbol at Standard Grade for English, Mathematics and Physical Science.

Selection criteria:
Applicants are selected by means of the following formula for academic merit, based on scholastic performance:

SYMBOL	HG VALUE	SG VALUE
A	8	7
B	7	6
C	6	5
D	4	3
E	2	1

To be considered for this qualification, applicants must have a score of at least **24** according to the table above.

- Applicants with a score of 30 and more according to the formula for academic merit determination will be considered for admission.
- Applicants with a score of 24 to 29 according to the formula for academic merit determination will be kept on a waiting list from which the applicants with the highest scores will be selected. Waiting lists will be cleared at the end of September.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics and 4 for Physical Sciences or Technical Sciences.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).

  Assessment procedure(s):
  - Applicants with a score of 27 and more will be considered for admission.
  - Applicants with a score of 21 to 26 will be kept on a waiting list from which the applicants with the highest scores will be selected. Waiting lists will be cleared at the end of September.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

  Admission requirement(s):
  A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 50% for English (home language or first additional language) and 50% for Mathematics, 40% for Life Orientation (excluded for APS calculation), 50% for Sciences, 50% in any two compulsory vocational subjects.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).

  Assessment procedure(s):
  - Applicants with a score of 27 and more will be considered for admission.
  - Applicants with a score of 21 to 26 will be kept on a waiting list from which the applicants with the highest scores will be selected. Waiting lists will be cleared at the end of September.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day classes.

e. *Minimum duration:*
Three years.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

g. *Practicals:*
It is compulsory for students to attend 100% of the practical classes. Students must pass the practical component of a module to be admitted to the examination.

h. *Textbooks:*
Textbooks and other educational material will be required.

i. Personal protective equipment:
Specific safety wear is compulsory (where applicable), and students must purchase it themselves.

j. WIL in Analytical Chemistry I:
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
AYC105D	Analytical Chemistry I	(5)	(24)	
CHM105X	Chemistry I	(5)	(24)	
CPL105X	Computer Literacy	(5)	(10)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LFI125X	Life Skills I (block module)	(5)	(2)	
MAT105X	Mathematics I	(5)	(24)	
PHI105X	Physics I	(5)	(24)	
TOTAL CREDITS FOR THE FIRST YEAR:			**120**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
EVC216D	Environmental Chemistry I	(6)	(12)	Analytical Chemistry I Chemistry I
INA216X	Inorganic Chemistry IIA	(6)	(12)	Chemistry I
OCA216X	Organic Chemistry IIA	(6)	(12)	Chemistry I
PCA216X	Physical Chemistry IIA	(6)	(12)	Chemistry I Mathematics I
TOTAL CREDITS FOR THE SEMESTER:			48	
SECOND SEMESTER				
INB216X	Inorganic Chemistry IIB	(6)	(18)	Inorganic Chemistry IIA
MSP216D	Molecular Spectroscopy I	(6)	(18)	Inorganic Chemistry IIA Organic Chemistry IIA Physical Chemistry IIA
OCB216X	Organic Chemistry IIB	(6)	(18)	Organic Chemistry IIA
PCB216X	Physical Chemistry IIB	(6)	(18)	Physical Chemistry IIA
TOTAL CREDITS FOR THE SEMESTER:			72	
TOTAL CREDITS FOR THE SECOND YEAR:			**120**	

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
ASP316D	Atomic Spectroscopy III	(6)	(18)	Molecular Spectroscopy I
CQA316D	Chemical Quality Assurance III	(6)	(12)	Analytical Chemistry I Environmental Chemistry I
CTG316D	Chromatography III	(6)	(18)	Inorganic Chemistry IIB Organic Chemistry IIB
ETC316D	Electrochemistry III	(6)	(12)	Physical Chemistry IIB
TOTAL CREDITS FOR THE SEMESTER:			60	
SECOND SEMESTER **On completion of all the modules.**				
WAC316D	WIL in Analytical Chemistry I	(6)	(60)	
TOTAL CREDITS FOR THE SEMESTER:			60	
TOTAL CREDITS FOR THE THIRD YEAR:			**120**	
TOTAL CREDITS FOR THE QUALIFICATION:			**360**	

5.3 ADVANCED DIPLOMA IN ANALYTICAL CHEMISTRY

AdvDip (Analytical Chemistry) - NQF Level 7 (120 credits)

Qualification code: ADAC20

SAQA ID: 111822, CHE NUMBER: H/H16/E069CAN

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
A Diploma in Analytical Chemistry, **or** a National Diploma: Analytical Chemistry, **or** a Bachelor of Science in Chemistry, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. Presentation:
Day classes.

f. Minimum duration:
One year.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
ACY107V	Analytical Chemistry Practice	(7)	(30)
FIRST SEMESTER			
ASP117V	Atomic Spectroscopy	(7)	(12)
SSP117V	Sampling and Sample Preparation	(7)	(12)
THM117V	Thermal Analysis and Kinetic Methods	(7)	(12)
SECOND SEMESTER			
CTG117V	Chromatography	(7)	(12)
EED117V	Electro-Analytical Techniques	(7)	(12)
MSP117V	Molecular Spectroscopy	(7)	(15)
SCH117V	Synthetic Chemistry	(7)	(15)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

5.4 POSTGRADUATE DIPLOMA IN CHEMISTRY

PGDip (Chemistry) - NQF Level 8 (120 credits)
Qualification code: PDCH21
SAQA ID: 111239, CHE NUMBER: H/H16/E072CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
An Advanced Diploma in Analytical Chemistry, **or** a Baccalaureus Technologiae: Chemistry, **or** any equivalent qualification at NQF Level 7 with 120 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes or block mode classes offered over a period of one year. Block mode classes are offered as determined by the Head of the Department.

f. Minimum duration:
A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Research Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
RCH108G	Research Project	(8)	(30)
RCH118R	Research Project (re-registration) (first-semester module, see paragraph h)	(8)	(0)
FIRST SEMESTER			
CTI118G	Catalysis	(8)	(15)
PHC118G	Physical Chemistry	(8)	(15)
SCY118G	Spectroscopy	(8)	(15)
SSI118G	Separation Science	(8)	(15)
SECOND SEMESTER			
MTS118G	Material Science	(8)	(15)
SCH118G	Synthetic Chemistry	(8)	(15)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

5.5 POSTGRADUATE DIPLOMA IN LABORATORY MANAGEMENT

PGDip (Laboratory Management) - NQF Level 8 (120 credits)
Qualification code: PDLM20
SAQA ID: 109279, CHE NUMBER: H/H16/E073CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
A relevant advanced diploma, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 7.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Block-mode classes.

f. *Minimum duration:*
Two years.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

ATTENDANCE 2024

CODE	MODULE	NQF-L	CREDIT
LFM108G	Laboratory Financial Management	(8)	(30)
LQP108G	Laboratory Quality and Productivity Management	(8)	(30)
TOTAL CREDITS FOR THE YEAR:			**60**

ATTENDANCE 2025

CODE	MODULE	NQF-L	CREDIT
LOR108G	Laboratory Organisation Management	(8)	(30)
LSF108G	Laboratory Safety Management	(8)	(30)
TOTAL CREDITS FOR THE YEAR:			**60**
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

5.6 MASTER OF APPLIED SCIENCES

MAppSci - NQF Level 9 (180 credits)

Qualification code: MDAP19

(Specialisation code for admission and registration: MDCH19)

SAQA ID: 102024, CHE NUMBERS: H16/10784/HEQSF, H16/2442/HEQSF, H16/10792/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor's degree, **or** a baccalaureus technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. Selection criteria:
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of one year and a maximum of three years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Applied Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
CHE109M	Dissertation: Chemistry	(9)	(180)
CHE109R	Dissertation: Chemistry (re-registration)	(9)	(0)
CHE119R	Dissertation: Chemistry (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

5.7 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation code for admission and registration: PHCH17)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of two years and a maximum of four years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
CH1010O	Thesis: Chemistry	(10)	(360)
CH1010R	Thesis: Chemistry (re-registration)	(10)	(0)
CH1110R	Thesis: Chemistry (re-registration) (semester module)	(10)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**360**

6. DEPARTMENT OF CROP SCIENCES

6.1 DIPLOMA IN CROP PRODUCTION

Dip (Crop Production) - NQF Level 6 (360 credits)

Qualification code: DPCP19

SAQA ID: 100980, CHE NUMBER: H16/14270/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with an E symbol at Higher Grade or a D symbol at Standard Grade for English and Mathematics.

Recommended subject(s):
Agricultural subjects. Preference will be given to applicants with Biology and/or Physical Science.

Selection criteria:
Prospective students are assessed by means of the following formula for academic merit, based on scholastic performance:

SYMBOL	HG VALUE	SG VALUE
A	8	7
B	7	6
C	6	5
D	4	3
E	2	1

Applicants are given two additional points for the following subjects (SG or HG):

Agricultural Economics, Agricultural Science, Agriculture, Biology, Chemistry, Computer Principles, Computer Studies, Field Husbandry, Geography, Mathematics, Physical Science, Physics, Practical Agriculture and/or Statistics.

- Applicants with a score of 23 and more according to the formula for academic merit determination will be considered for admission.
- Applicants with a score of 20 to 22 according to the formula for academic merit determination will be kept on a waiting list from which the applicants with the highest scores will be selected. Waiting lists will be cleared at the end of September and November.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), and 3 for Mathematics or Technical Mathematics or 4 for Mathematical Literacy.

  Recommended subject(s):
  Agricultural subjects. Preference will be given to applicants with Life Sciences and/or Physical Sciences.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **19** (with Mathematics or Technical Mathematics) or **20** (with Mathematical Literacy). Life Orientation is excluded from the APS calculation.

  Assessment procedure(s):
  - Applicants with a score of 23 and more will be considered for admission.
  - Applicants with a score of 20 (19 with Mathematics or Technical Mathematics) to 22 will be kept on a waiting list from which the applicants with the highest APS will be selected. Waiting lists will be cleared at the end of September and November.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

  Admission requirement(s):
  A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 50% for English (home language or first additional language) and 40% for Mathematics or 50% for Mathematical Literacy, 40% for Life Orientation (excluded for APS calculation), and 50% for any other three compulsory vocational subjects.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **19** (with Mathematics) or **20** (with Mathematical Literacy). Life Orientation is excluded from the APS calculation.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day classes.

e. *Minimum duration:*
Three years.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

g. *WIL in Crop Production I:*
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
BOT105D	Botany I	(5)	(24)	
CPL105X	Computer Literacy	(5)	(10)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LFI125X	Life Skills I (block module)	(5)	(2)	
MAS105X	Mathematics and Statistics I	(5)	(12)	
SOR105D	Science for Occupational Purpose I	(5)	(12)	

FIRST SEMESTER

AGE115D	Agricultural Economics I (offered in both semesters)	(5)	(12)
AGM115D	Agricultural Mechanisation I	(5)	(12)

SECOND SEMESTER

CPR115D	Crop Production I	(5)	(12)
CPT115D	Crop Protection I	(5)	(12)
SOS115D	Soil Science I	(5)	(12)

TOTAL CREDITS FOR THE FIRST YEAR: **132**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CPT206D	Crop Protection II	(6)	(24)	Crop Protection I
FLC206D	Field Crops II	(6)	(21)	Crop Production I
FRP206D	Fruit Production II	(6)	(21)	Crop Production I
SOS206D	Soil Science II	(6)	(21)	Soil Science I
VGP206D	Vegetable Production II	(6)	(21)	Crop Production I

TOTAL CREDITS FOR THE SECOND YEAR: **108**

THIRD YEAR
On completion of all modules.

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
WCP306D	WIL in Crop Production I	(6)	(120)	

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

6.2 ADVANCED DIPLOMA IN CROP SCIENCES

AdvDip (Crop Sciences) - NQF Level 7 (120 credits)

Qualification code: ADCP20

SAQA ID: 108856, CHE NUMBER: H/H16/E071CAN

Campus where offered: Pretoria Campus

REMARKS

a. *Admission requirement(s):*
A Diploma in Crop Production, **or** A National Diploma: Agriculture: Commercial Mixed Farming or Crop Production or Development and Extension, **or** a Bachelor's degree in Agriculture (Crop/Plant Production), **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes.

f. *Minimum duration:*
One year.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
AGB107V	Agribusiness	(7)	(24)
AGR107V	Agronomy	(7)	(24)
CPT107V	Crop Protection	(7)	(24)
FVC107V	Fruit and Vegetable Crops	(7)	(24)

FIRST SEMESTER

SIC117V	Soil and Irrigation Science	(7)	(12)

SECOND SEMESTER

PHA117V	Post-Harvest Technology	(7)	(12)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

6.3 POSTGRADUATE DIPLOMA IN CROP SCIENCES

PGDip (Crop Sciences) - NQF Level 8 (120 credits)

Qualification code: PDCP22

SAQA ID: 110604, CHE NUMBER: H/H16/E093CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
An Advanced Diploma in Crop Sciences, **or** a Baccalaureus Technologiae: Agriculture: Crop Production, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 7. Preference will be given to candidates who obtained an average of 60% in the previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

All applicants received by the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan (SEP), only the top performing applicants will be selected. A waiting list consisting of the remainder of the applicants will provide an opportunity for applicants to fill places created by accepted students failing to meet the enrolment dates. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes offered over a period of one year.

f. Minimum duration:
A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Postgraduate Research Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
BIT108G	Biometrics	(8)	(12)
PCP108G	Postgraduate Research Project	(8)	(24)
PCP118R	Postgraduate Research Project (Re-registration) (first-semester module, see paragraph h)	(8)	(0)
RTE108G	Research Methodology and Ethics	(8)	(12)
	plus two of the following electives:		
AGR108G	Special Topics in Agronomy	(8)	(36)
CPT108G	Special Topics in Crop Protection	(8)	(36)
FVC108G	Special Topics in Fruit and Vegetable Crops	(8)	(36)
PHA108G	Special Topics in Post-Harvest Technology	(8)	(36)
SIC108G	Special Topics in Soil and Irrigation Science	(8)	(36)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

6.4 MASTER OF AGRICULTURAL SCIENCE

MAgricSci - NQF Level 9 (180 credits)

Qualification code: MDAS19

(Specialisation codes for admission and registration: MDAE20 / MDCP19 / MDCT21 / MDCN21 / MDSN20)

SAQA ID: 96889, CHE NUMBER: H16/2422/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
A Postgraduate Diploma in Agriculture, **or** a Baccalaureus Technologiae: Agriculture, **or** a Bachelor Honours degree in Agriculture from a South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. *Selection criteria:*
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of one year and a maximum of three years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Agricultural Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: MDAE20			
AGE109M	Dissertation: Agricultural Economics and Extension	(9)	(180)
AGE109R	Dissertation: Agricultural Economics and Extension (re-registration)	(9)	(0)
AGE119R	Dissertation: Agricultural Economics and Extension (re-registration) (semester module)	(9)	(0)
Option 2: MDCP19			
CPS109M	Dissertation: Agriculture: Crop Production	(9)	(180)
CPS109R	Dissertation: Agriculture: Crop Production (re-registration)	(9)	(0)
CPS119R	Dissertation: Agriculture: Crop Production (re-registration) (semester module)	(9)	(0)
Option 3: MDCT20			
CPT109M	Dissertation: Crop Protection	(9)	(180)
CPT109R	Dissertation: Crop Protection (re-registration)	(9)	(0)

CPT119R	Dissertation: Crop Protection (re-registration) (semester module)	(9)	(0)

Option 4: MDCN21

CRC109M	Dissertation: Crop Science	(9)	(180)
CRC109R	Dissertation: Crop Science (re-registration)	(9)	(0)
CRC119R	Dissertation: Crop Science (re-registration) (semester module)	(9)	(0)

Option 5: MDSN20

SOS109M	Dissertation: Soil Sciences	(9)	(180)
SOS109R	Dissertation: Soil Sciences (re-registration)	(9)	(0)
SOS119R	Dissertation: Soil Sciences (re-registration) (semester module)	(9)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **180**

6.5 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation code for admission and registration: PHAE21 / PHAS21 / PHCP17 / PHCT21 / PHSN21)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of two years and a maximum of four years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: PHAE21			
AG1010O	Thesis: Agricultural Economics and Extension	(10)	(360)
AG1010R	Thesis: Agricultural Economics and Extension (re-registration)	(10)	(0)
AG1110R	Thesis: Agricultural Economics and Extension (re-registration) (semester module)	(10)	(0)
Option 2: PHAS21			
AS1010O	Thesis: Crop Science	(10)	(360)
AS1010R	Thesis: Crop Science (re-registration)	(10)	(0)
AS1110R	Thesis: Crop Science (re-registration) (semester module)	(10)	(0)
Option 3: PHCP17			
CP1010O	Thesis: Agriculture: Crop Production	(10)	(360)
CP1010R	Thesis: Agriculture: Crop Production (re-registration)	(10)	(0)
CP1110R	Thesis: Agriculture: Crop Production (re-registration) (semester module)	(10)	(0)
Option 4: PHCT21			
RI1010O	Thesis: Crop Protection	(10)	(360)
RI1010R	Thesis: Crop Protection (re-registration)	(10)	(0)
RI1110R	Thesis: Crop Protection (re-registration) (semester module)	(10)	(0)
Option 5: PHSN21			
SN1010O	Thesis: Soil Sciences	(10)	(360)
SN1010R	Thesis: Soil Sciences (re-registration)	(10)	(0)
SN1110R	Thesis: Soil Sciences (re-registration) (semester module)	(10)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**360**

7. DEPARTMENT OF ENVIRONMENTAL HEALTH

7.1 BACHELOR OF ENVIRONMENTAL HEALTH

BEnvironmental Health - NQF Level 8 (499 credits)

Qualification type: Professional Bachelor's Degree

Qualification code: BPEH01

SAQA ID: 93858, CHE NUMBER: H/H16/E018CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate with a matriculation endorsement or an equivalent qualification, with a D symbol at Higher Grade for English, Biology, Mathematics and Physical Science.

Recommended subject(s):
Geography and Agricultural Science.

Selection criteria:
Selection is done in accordance with the Health Professional Council of South Africa (HPCSA). Students are assessed by means of a formula for academic merit, based on scholastic performance.

Formula for academic merit:

SYMBOL	HG
A	5
B	4
C	3
D	2

i. The subjects Biology, English, Mathematics and Physical Science will be used to assess the application.
ii. One (1) additional point will be added if the applicant has passed Agricultural Science and/or Geography.
iii. Applicants who score eight (8) or more points according to the formula for academic merit will be accepted.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate with a bachelor's degree endorsement (four subjects with a minimum score of 4 in each) or equivalent recognised qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics, 4 for Physical Sciences or Technical Sciences, 4 for Life Sciences and 4 for two other subjects (excluding Life Orientation).

Recommended subject(s):
None.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

Assessment procedure(s):
No further assessments will be done. Applicants who receive the minimum APS will be considered for placement subject to availability of space.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):
A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree endorsement issued by the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% (APS of 4) for English, Mathematics, Physical Sciences and Life Sciences and any two other additional vocational subjects. A candidate may have a score of less than 4 for each of the additional subjects provided that the final APS is at least 24.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

Assessment procedure(s):
No further assessments will be done. Applicants who receive the minimum APS will be considered for placement subject to availability of space.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day classes. This programme consists of formal tuition and Work-Integrated Learning.

e. *Minimum duration:*
Four years.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

g. *Professional registration:*
Compulsory, once-off, students have to register in the first year with the Health Professions Council of South Africa (HPCSA). HPCSA requires students to complete community service for a period of one year on successful completion of this qualification.

h. *Special rules and regulations:*
Unless otherwise stipulated, special rules and regulations, as published in the programme guide, apply to students who register for this qualification. Students should familiarise themselves with those rules and regulations. Students will handle carcasses, body parts, entrails and fluids of slaughtered animals referred to in the Meat Safety Act, 2000 (Act No. 40 of 2000) and its regulations during abattoir and laboratory practical. Students undergo work-integrated learning and take study tours. They have to purchase protective clothing for the module, Food and Meat Hygiene.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
AAP105P	Anatomy and Physiology I	(5)	(17)	
CHE105P	Chemistry I	(5)	(15)	
IEV105P	Introduction to Environmental Health I	(5)	(20)	
MIB105P	Microbiology I	(5)	(15)	
PHY105P	Physics I	(5)	(20)	
SOC105P	Sociology I	(5)	(17)	
FIRST SEMESTER				
CAP115P	Communication for Academic Purposes I	(5)	(8)	
SECOND SEMESTER				
ITC125P	Computer Literacy I	(5)	(8)	
TOTAL CREDITS FOR THE FIRST YEAR:			**120**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CDV206P	Community Development II	(6)	(15)	Sociology I
EPL206P	Environmental Pollution: Waste, Water and Air II	(6)	(15)	Anatomy and Physiology I Chemistry I
FMH206P	Food and Meat Hygiene II	(6)	(21)	Microbiology I
IDE206P	Infectious Disease Epidemiology II	(6)	(18)	Microbiology I
OHS206P	Occupational Health and Safety (Physical) II	(6)	(20)	Anatomy and Physiology I Physics I
PBE206P	Planning for Built Environment II	(6)	(15)	Introduction to Environmental Health I
FIRST SEMESTER				
COP216P	Communication for Occupational Purposes II	(6)	(8)	Communication for Academic Purposes I
SECOND SEMESTER				
REM126P	Research Methodology I	(6)	(10)	Introduction to Environmental Health I
TOTAL CREDITS FOR THE SECOND YEAR:			**122**	

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
EEM307P	Environmental Epidemiology III	(7)	(17)	Infectious Disease Epidemiology II
EHM307P	Environmental Health Management and Administration III	(7)	(20)	Community Development II
FPS307P	Food Processing and Safety III	(7)	(22)	Food and Meat Hygiene II

OHS307P	Occupational Health and Safety (Chemical and Biological) III	(7)	(22)	Occupational Health and Safety (Physical) II
RMB207P	Research Methodology and Biostatistics II	(7)	(14)	Research Methodology I
WQW307P	Water Quality and Wastewater Management III	(7)	(15)	Environmental Pollution: Waste, Water and Air II

TOTAL CREDITS FOR THE THIRD YEAR: **110**

FOURTH YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
AQM408P	Air Quality Management IV	(8)	(15)	
DMA408P	Disaster Management IV	(8)	(16)	
FSM408P	Food Safety Management IV	(8)	(15)	Food Processing and Safety III
MAP408P	Management Practice IV	(8)	(15)	Environmental Health Management and Administration III
OHS408P	Occupational Health and Safety Management IV	(8)	(20)	Occupational Health and Safety (Chemical and Biological) III
WMA408P	Waste Management IV	(8)	(21)	Water Quality and Wastewater Management III

FIRST SEMESTER

REP408P	Research Project IV	(8)	(25)	Research Methodology and Biostatics II

SECOND SEMESTER

EMA428P	Environmental Management IV	(8)	(20)	

TOTAL CREDITS FOR THE FOURTH YEAR: **147**

TOTAL CREDITS FOR THE QUALIFICATION: **499**

7.2 MASTER OF HEALTH SCIENCES

MHealthSci - NQF Level 9 (180 credits)

Qualification code: MDHS19

(Specialisation code for admission and registration: MDEH20)

SAQA ID: 96890, CHE NUMBER: H16/11150/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor's degree, **or** a baccalaureus technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:

- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. Selection criteria:
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of one year and a maximum of three years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Health Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
ENH109M	Dissertation: Environmental Health	(9)	(180)
ENH109R	Dissertation: Environmental Health (re-registration)	(9)	(0)
ENH119R	Dissertation: Environmental Health (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

7.3 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17 - NQF Level 10 (360 credits)

(Specialisation code for admission and registration: PHEH21)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of two years and a maximum of four years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
EH1010O	Thesis: Environmental Health	(10)	(360)
EH1010R	Thesis: Environmental Health (re-registration)	(10)	(0)
EH1110R	Thesis: Environmental Health (re-registration) (semester module)	(10)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **360**

8. DEPARTMENT OF ENVIRONMENTAL, WATER AND EARTH SCIENCES

8.1 DIPLOMA IN ENVIRONMENTAL SCIENCES

Dip (Environmental Sciences) - NQF Level 6 (360 credits)

Qualification code: DPEV19

SAQA ID: 100981, CHE NUMBER: H16/14271/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with a D symbol at Standard Grade or an E symbol at Higher Grade for English, Mathematics and Physical Science.

Recommended subject(s):
Biology and Geography.

Selection criteria:
Applicants who meet the minimum requirements will be invited to do an aca-demic proficiency test. The applicants' performance in the Senior Certificate will contribute 80% to the final admission score and the academic proficiency test 20%. Applicants who pass the proficiency test will be shortlisted for selection by a departmental selection panel.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics and 4 for Physical Sciences or Technical Sciences.

Recommended subject(s):
Geography and Life Sciences.

Selection criteria:
For 2024: To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).
As from 2025: To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

Assessment procedure(s):
For 2024: Applicants with a score of 24 and more will be considered for admission. Applicants with a score of 21 to 23 will be invited to do an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test, will contribute 20%.
As from 2025: No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

- **FOR APPLICANTS WITH QUALIFICATIONS ON THE HIGHER EDUCATION QUALIFICATION SUB-FRAMEWORK (HEQSF) OFFERED BY UNIVERSITIES OF TECHNOLOGY:**

  For articulation into this programme, a National Senior Certificate or an equivalent qualification, with a higher certificate endorsement, with an achievement level of at least 3 for Physical Sciences, is required.

  The applicant will be considered for admission to the programme, if the following qualification has been completed within the minimum time of one year (full-time classes) and within the minimum time of two years (block classes):

  Higher Certificate in Resource and Waste Management (NQF level 5 - 120 credits): with an average of at least 60% for the qualification, and 60% in each of the following two modules: Earth and General Science for Occupational Health and Introduction to Environmental Science.

  Exemption will be granted from equivalent modules: Communication for Academic Purposes, Computer Literacy, Information Literacy I and Life Skills I.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes.

f. *Minimum duration:*
Three years.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. *WIL in Environmental Sciences I:*
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
CPL105X	Computer Literacy	(5)	(10)	
GCH105D	General Chemistry I	(5)	(24)	
GMA105D	General Mathematics I	(5)	(24)	
GPH105D	General Physics I	(5)	(24)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LFI125X	Life Skills I (block module)	(5)	(2)	

FIRST SEMESTER

AEP115D	Applied Environmental Practice I	(5)	(6)
EVB115D	Environmental Biology I	(5)	(6)

SECOND SEMESTER

EVE115D	Environmental Earth Studies I	(5)	(6)
EVM115D	Environmental Management I	(5)	(6)

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
AEP206D	Applied Environmental Practice II	(6)	(20)	Applied Environmental Practice I
ELP206D	Environmental Legal Practice II	(6)	(20)	
EPS206D	Environmental Pollution Science II	(6)	(20)	General Chemistry I
EVB206D	Environmental Biology II	(6)	(20)	Environmental Biology I
EVE206D	Environmental Earth Studies II	(6)	(20)	Environmental Earth Studies I
EVM206D	Environmental Management II	(6)	(20)	Environmental Management I

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
AEP316D	Applied Environmental Practice III	(6)	(15)	Applied Environmental Practice II
EPS316D	Environmental Pollution Science III	(6)	(15)	Environmental Pollution Science II
EVB316D	Environmental Biology III	(6)	(15)	Environmental Biology II
EVM316D	Environmental Management III	(6)	(15)	Environmental Management II
SECOND SEMESTER **On completion of all modules.**				
WES316D	WIL in Environmental Sciences I	(6)	(60)	

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

8.2 ADVANCED DIPLOMA IN ENVIRONMENTAL SCIENCES

AdvDip (Environmental Sciences) - NQF Level 7 (120 credits)

Qualification code: ADEV20

SAQA ID: 105101, CHE NUMBER: H/H16/E068CAN

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
A Diploma in Environmental Sciences, **or** a National Diploma: Environmental Sciences, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes.

f. *Minimum duration:*
One year.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. *Re-registration:*
A student may re-register for the module Environmental Research Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
ENR107V	Environmental Research Project	(7)	(48)
ENR117R	Environmental Research Project (re-registration) (first-semester module, see paragraph h)	(7)	(0)
EVD107V	Environmental Management	(7)	(24)
EVS107V	Environmental Science	(7)	(24)

TER117V	Theory of Environmental Research (first-semester module)	(7)	(24)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

8.3 POSTGRADUATE DIPLOMA IN ENVIRONMENTAL SCIENCES

PGDip (Environmental Sciences) - NQF Level 8 (120 credits)
Qualification code: PDEV24
SAQA ID: 120582, CHE NUMBER: H/H16/E213CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
An Advanced Diploma in Environmental Sciences, **or** a Bachelor's degree in Environmental Sciences, **or** a Baccalaureus Technologiae in Environmental Sciences, **or** an equivalent qualification (in the fields of Nature Conservation, Zoology, Botany or Geography) at NQF Level 7.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated and selected by a Departmental Selection Panel. Applicants who achieved an average mark of 60% or above for their NQF level 7 qualification will be shortlisted and invited for an interview.

All applicants received by the published due date will be evaluated and ranked according to the previous related qualification obtained. Only the top performing applicants will be selected as per Departmental Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes.

f. Minimum duration:
One year.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Environmental Science Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
ENS108G	Environmental Science	(8)	(24)
ERM108G	Research Methodology	(8)	(12)
GIN108G	Geographical Information Systems (GIS)	(8)	(18)
LCE108G	Landscape and Community Ecology	(8)	(24)
NRE108G	Natural Resource and Environmental Management	(8)	(18)
NSP108G	Environmental Science Project	(8)	(24)
NSP118R	Environmental Science Project (re-registration, first-semester module, see paragraph h)	(8)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

8.4 DIPLOMA IN GEOLOGY

Dip (Geology) - NQF Level 6 (372 credits)

Qualification code: DPGE19

SAQA ID: 100982, CHE NUMBER: H16/14272/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with a D symbol at Standard Grade or an E symbol at Higher Grade for English, Mathematics and Physical Science.

Recommended subject(s):
Geography.

Selection criteria:
Applicants who meet the minimum requirements will be invited to do an academic proficiency test. The applicants' performance in the Senior Certificate will contribute 80% to the final admission score and the academic proficiency test 20%. Applicants who pass the proficiency test will be shortlisted for selection by a departmental selection panel.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics and 4 for Physical Sciences or Technical Sciences.

  Recommended subject(s):
  Computer Applications Technology, Geography and/or Information Technology.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).

  Assessment procedure(s):
  Applicants with a score of 24 and more will be considered for admission. Applicants with a score of 21 to 23 will be invited to do an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test, will contribute 20%.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

  Admission requirement(s):
  A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 50% for English (home language or first additional language) and 50% for Mathematics, 40% for Life Orientation (excluded for APS calculation), 50% for Sciences, and 50% for any other two compulsory vocational subjects.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).

  Assessment procedure(s):
  Applicants with a score of 24 and more will be considered for admission. Applicants with a score of 21 to 23 will be invited to do an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test, will contribute 20%.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day classes.

e. *Minimum duration:*
Three years.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

g. *WIL in Geology I:*
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
CHM105X	Chemistry I	(5)	(24)	
CPL105X	Computer Literacy	(5)	(10)	
GMA105D	General Mathematics I	(5)	(24)	
GPH105D	General Physics I	(5)	(24)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LFI125X	Life Skills I (block module)	(5)	(2)	
FIRST SEMESTER				
ENT115D	Entrepreneurship I	(5)	(12)	
GEO115D	Geology I	(5)	(6)	
SECOND SEMESTER				
GMG115D	Geological Maps I	(5)	(6)	Geology I
MIG115D	Mineralogy	(5)	(6)	Geology I
STG115D	Stratigraphy	(5)	(6)	Geology I
TOTAL CREDITS FOR THE FIRST YEAR:			**132**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
EAG206D	Environmental Earth Sciences I	(6)	(12)	Geology I
ECG206D	Economic Geology	(6)	(20)	Mineralogy Stratigraphy
ENG206D	Engineering Geology I	(6)	(20)	Geology I Mineralogy
PEG206D	Petrology	(6)	(12)	Mineralogy
FIRST SEMESTER				
GMG216D	Geological Maps II	(6)	(12)	Geological Maps I
SGG216D	Structural Geology	(6)	(12)	Geology I
SECOND SEMESTER				
GEP216D	Geophysics I	(6)	(20)	General Physics I Geology I
HYG216D	Hydrogeology I	(6)	(12)	Geology I
TOTAL CREDITS FOR THE SECOND YEAR:			**120**	

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
EAG316D	Environmental Earth Sciences II	(6)	(12)	Environmental Earth Sciences I Petrology

ENG316D	Engineering Geology II	(6)	(18)	Engineering Geology I
GEP316D	Geophysics II	(6)	(18)	Geophysics I
GIS316D	Geographic Information Systems and Remote Sensing	(6)	(12)	Geological Maps II Petrology
HYG316D	Hydrogeology II	(6)	(18)	Hydrogeology I
MEG316D	Mining and Exploration Geology	(6)	(18)	Economic Geology Petrology

SECOND SEMESTER

WGD316D	WIL in Geology I	(6)	(24)
WGD316R	WIL in Geology I (re-registration) (first- or second-semester module)	(6)	(0)

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **372**

8.5 ADVANCED DIPLOMA IN GEOLOGY

AdvDip (Geology) - NQF Level 7 (120 credits)

Qualification code: ADGE21

SAQA ID: 113013, CHE NUMBER: H/H16/E074CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
A National Diploma: Geology, **or** a Diploma in Geology **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes.

f. Minimum duration:
A minimum of one year or two years, depending on the programme offering.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
ENG107V	Engineering Geology IV	(7)	(25)
GEP107V	Geophysics IV	(7)	(25)
HYG107V	Hydrogeology IV	(7)	(25)
MEG107V	Mining and Exploration Geology IV	(7)	(25)
RGE107V	Research Methodology	(7)	(20)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

8.6 POSTGRADUATE DIPLOMA IN GEOLOGY

PGDip (Geology) - NQF Level 8 (120 credits)

Qualification code: PDGE21

SAQA ID: 111177, CHE NUMBER: H/H16/E097CAN

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
An Advanced Diploma in Geology, **or** a Baccalaureus Technologiae: Geology, **or** a Bachelor's degree in Geology, **or** an equivalent qualification at NQF level 7 with 120 credits. Preference will be given to applicants with an average of 60% or more in the previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Selection is based on an assessment by a departmental selection panel. Candidates will be evaluated based on the performance in the previous qualification obtained and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes.

f. *Minimum duration:*
One year.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Research Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
ENG108G	Engineering Geology V	(8)	(20)
GEP108G	Geophysics V	(8)	(20)
HYG108G	Hydrogeology V	(8)	(20)
MEG108G	Mining and Exploration Geology V	(8)	(20)
RPG108G	Research Project	(8)	(40)
RPG118R	Research Project (re-registration) (semester module, see paragraph h)	(8)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

8.7 HIGHER CERTIFICATE IN RESOURCE AND WASTE MANAGEMENT

HCert (Resource and Waste Management) - NQF Level 5 (120 credits)
Qualification code: HCRW22
SAQA ID: 118277, CHE NUMBER: H/H16/E210CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

  Admission requirement(s):
  A Senior Certificate or an equivalent qualification, with at least an E symbol at Higher Grade or a D symbol at Standard Grade for English and Mathematics.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **18**.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate or an equivalent qualification,with a higher certificate endorsement, with an achievement level of at least 3 for English (home language or first additional language), 3 for Mathematics or Technical Mathematics, or 6 for Mathematical Literacy.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **18** (with Mathematics or Technical Mathematics) or **21** (with Mathematical Literacy). Life Orientation is excluded from the APS calculation.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

  Admission requirement(s):
  A National Certificate (Vocational) at NQF Level 4 with a higher certificate endorsement, issued by the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% for English and 50% Mathematics or 70% for Mathematical Literacy, and 40% for Life Orientation (excluded for APS calculation), and 50% for any two vocational subjects.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **18** (with Mathematics or Technical Mathematics) or **21** (with Mathematical Literacy). Life Orientation is excluded from the APS calculation.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE AS PUBLISHED IN NATED 191: N3 (NQF LEVEL 4):**

  Admission requirement(s):
  A National Senior Certificate or a National N Certificate as published in Nated 191: N3 (NQF Level 4) issued by both the Department of Higher Education (DHET) and the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% for English, 50% for Mathematics N3, and any two additional N3 subjects; or any equivalent qualification at NQF Level 4.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **20**.

- **FOR APPLICANTS WITH AN N4 CERTIFICATE IN AN ENGINEERING FIELD AS PUBLISHED IN NATED 191: N4:**

  Admission requirement(s):
  An N4 Certificate in a related Engineering field as published in Nated 191: N4 issued by both the Department of Higher Education and Training (DHET) and the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% for English N3, and with at least an average of 50% for the qualification.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **20**.

- **FOR APPLICANTS WITH A FURTHER EDUCATION AND TRAINING CERTIFICATE (NQF LEVEL 4):**

  - A Further Education and Training Certificate: Environmental Practice at NQF Level 4 with an average of 50% in all subjects.

b. Selection criteria:
For 2024: Applicants who achieve the minimum APS will be invited to write an academic proficiency test and students will be selected according to the results obtained in this test.
As from 2025: No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Articulation to the Diploma in Environmental Sciences:*
It is possible to articulate to the Diploma in Environmental Sciences after completion of this programme. Please study the admission requirements of the Diploma in Environmental Sciences for further detail. However, please note that for articulation into the Diploma in Environmental Sciences, a National Senior Certificate or an equivalent qualification, with a higher certificate endorsement, with an achievement level of at least 3 for Physical Sciences, is required.

e. *Intake for the qualification:*
January only.

f. *Presentation:*
Day or block-mode classes.

g. *Minimum duration:*
A minimum of one or two years (depending on the programme presentation).

h. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

i. *Environmental Practice and Professionalism (WIL Theory-Based)*
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

Day-class students should register for all modules in one academic year. Block-mode students should complete the programme over a period of two years.

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
11P105X	Communication for Academic Purposes	(5)	(10)
CPL105X	Computer Literacy	(5)	(10)
EGS105C	Earth and General Science for Occupational Health	(5)	(12)
EPP105C	Environmental Practice and Professionalism (WIL Theory-Based)	(5)	(24)
IEW105C	Introduction to Environmental and Waste Management	(5)	(12)
INL125X	Information Literacy (block module)	(5)	(2)
INS105C	Introduction to Environmental Science	(5)	(12)
LFS125X	Life Skills (block module)	(5)	(2)
MAS105X	Mathematics and Statistics I	(5)	(12)
	plus two of the following electives:		
IEI105C	Introduction to Environmental Impact Management	(5)	(12)
IIW105C	Introduction to Industrial Waste	(5)	(12)
IWD105C	Introduction to Waste Diversion	(5)	(12)
IWI105C	Introduction to Waste Innovation	(5)	(12)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

8.8 HIGHER CERTIFICATE IN WATER TREATMENT

HCert (Water Treatment) - NQF Level 5 (120 credits)

Qualification code: HCWT19

SAQA ID: 101588, CHE NUMBER: H/H16/E047CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with at least an E symbol for English, Mathematics and Physical Science.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **18**.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate with a higher certificate endorsement, or an equivalent qualification, with an achievement level of at least 3 for English (home language or first additional language), 3 for Mathematics or Technical Mathematics (or 6 for Mathematical Literacy) and 3 for Physical Sciences or Technical Sciences.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **18** (with Mathematics or Technical Mathematics) or **21** (with Mathematical Literacy). Life Orientation is excluded from the APS calculation.

Assessment procedure(s):
Applicants with a score of 18 and more will be considered for admission.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):
A National Certificate (Vocational) at NQF Level 4 with a higher certificate endorsement, issued by the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% for English and 50% Mathematics or 40% for Mathematical Literacy, and 50% for Sciences, and 40% for Life Orientation (excluded for APS calculation) and 50% for any two vocational subjects.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **18** (with Mathematics) or **21** (with Mathematical Literacy). Life Orientation is excluded from the APS calculation.

Assessment procedure(s):
Applicants with a score of 18 and more will be considered for admission.

- **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN NATED 191: N3 (NQF LEVEL 4):**

  Admission requirement(s):
  A National Senior Certificate or a National N Certificate as published in Nated 191: N3 (NQF Level 4) issued by both the Department of Higher Education (DHET) and the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% for English, 50% for Mathematics N3, Engineering Science N3, and any two additional N3 subjects.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24**.

- **FOR APPLICANTS WITH A FURTHER EDUCATION AND TRAINING CERTIFICATE (NQF LEVEL 4):**

  A Further Education and Training Certificate: Water and Wastewater Treatment Process Control Supervision or any other equivalent qualification at NQF Level 4.

- **FOR APPLICANTS WITH AN N4 CERTIFICATE IN AN ENGINEERING FIELD AS PUBLISHED IN NATED 191: N4:**

  Admission requirement(s):
  An N4 Certificate in a related Engineering field as published in Nated 191: N4 issued by both the Department of Higher Education and Training (DHET) and the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% for English N3, and with at least an average of 50% for the qualification.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24**.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day and block-mode classes (block-mode classes are only offered to students who are employed).

e. *Minimum duration:*
A minimum of one or two years depending on the programming offering.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

Day-class students should register for all modules in one academic year. Block-mode students should complete the programme over a period of two years.

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
ALI125X	Academic Literacy (block module)	(5)	(2)
COE105X	Communication for Academic Purpose	(5)	(10)
CPL105X	Computer Literacy	(5)	(10)
ESA115C	Equipment and Safety I (second-semester module)	(5)	(18)
LFS125X	Life Skills (block module)	(5)	(2)
WQU105C	Water Quality I	(5)	(18)
WSC105C	Water Science I	(5)	(18)
WTR105C	Water Treatment I	(5)	(21)
WWT105C	Wastewater Treatment I	(5)	(21)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

8.9 ADVANCED CERTIFICATE IN WATER TREATMENT

AdvCert (Water Treatment) - NQF Level 6 (120 credits)

Qualification code: ACWT21

SAQA ID: 109959, CHE NUMBER: H/H16/E111CAN

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
A Higher Certificate in Water Treatment, **or** an equivalent qualification at NQF Level 5 with a minimum of 120 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Applicants will be evaluated based on the marks obtained in the previous qualification and/or work experience.

All completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Block-mode classes offered over a period of two years.

f. *Minimum duration:*
A minimum of one or two years (depending on the programme presentation).

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT
WAN106A	Water Analysis I	(6)	(21)
WCH106A	Water Chemistry I	(6)	(21)
WPM106A	Water Plant Management I	(6)	(18)
TOTAL CREDITS FOR THE FIRST YEAR:			**60**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT
WAO106A	Water Operations I	(6)	(12)
WLG106A	Water Legislation	(6)	(12)
WTR106A	Water Treatment II	(6)	(18)
WWT106A	Wastewater Treatment II	(6)	(18)
TOTAL CREDITS FOR THE SECOND YEAR:			**60**
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

8.10 DIPLOMA IN WATER SCIENCE AND TECHNOLOGY

Dip (Water Science and Technology) - NQF Level 6 (360 credits)

Qualification code: DPWS19

SAQA ID: 101429, CHE NUMBER: H/H16/E049CAN

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s) and selection criteria:*

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with a D symbol at Standard Grade or an E symbol at Higher Grade for English, Mathematics and Physical Science.

Recommended subject(s):
Biology.

Assessment procedure(s):
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **18**.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics and 4 for Physical Sciences or Technical Sciences.

  Recommended subject(s):
  Life Sciences.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).

  Assessment procedure(s):
  Applicants with an Admission Point Score (APS) of 21 and more will be considered for admission.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

  Admission requirement(s):
  - A National Certificate (Vocational) at NQF Level 4 with a diploma or bachelor's degree endorsement, with at least a 50% (APS of 4) for English (home language or first additional language), Mathematics and Science, 40% for Life Orientation (excluded for APS calculation), 50% for any other two compulsory vocational subjects; **or**
  - A Further Education and Training Certificate: Water and Wastewater Treatment Process Control Supervision at NQF Level 4.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).

- **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN NATED 191: N3 (NQF LEVEL 4):**

  Admission requirement(s):
  - A National N3 Certificate: with at least 50% for English, 50% for Mathematics N3, Engineering Science N3, and any two additional N3 subjects; **or**
  - A Further Education and Training Certificate: Water and Wastewater Treatment Process Control Supervision at NQF Level 4.

- **FOR APPLICANTS WITH QUALIFICATIONS ON THE HIGHER EDUCATION QUALIFICATION SUB-FRAMEWORK (HEQSF) OFFERED BY UNIVERSITIES OF TECHNOLOGY:**

  The applicant will be considered for admission to the programme, if any of the following qualifications has been completed:

  - Higher Certificate in Water Treatment (NQF Level 5 - 120 credits). Exemption will be granted from equivalent modules: Computer Literacy, Communication for Academic Purpose, Life Skills, Academic Literacy, Water Technology I, Water Treatment I and Wastewater Treatment I.

- Advanced Certificate in Water Treatment (NQF Level 6 - 120 credits). Exemption will be granted from equivalent modules: Water Microbiology I, Water Treatment II, Wastewater Treatment II, Water Analysis I, Water Chemistry I, and Water Plant Management I.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day classes.

e. *Minimum duration:*
Three years.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

g. *Work-Integrated Learning: Water Science and Technology:*
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
ALI125X	Academic Literacy (block module)	(5)	(2)	
CHM105X	Chemistry I	(5)	(24)	
COE105X	Communication for Academic Purpose	(5)	(10)	
CPL105X	Computer Literacy	(5)	(10)	
LFS125X	Life Skills (block module)	(5)	(2)	
MAT105X	Mathematics I	(5)	(24)	
PHI105X	Physics I	(5)	(24)	
FIRST SEMESTER				
WTE115D	Water Technology I	(5)	(12)	
SECOND SEMESTER				
WMB115D	Water Microbiology I	(5)	(12)	
TOTAL CREDITS FOR THE FIRST YEAR:			**120**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
WAN206D	Water Analysis I	(6)	(21)	Chemistry I Mathematics I Water Technology I
FIRST SEMESTER				
WCH216D	Water Chemistry I	(6)	(21)	Chemistry I Mathematics I Water Technology I

WMB216D	Water Microbiology II	(6)	(18)	Water Microbiology I

TOTAL CREDITS FOR THE SEMESTER: 60

SECOND SEMESTER

WPM216D	Water Plant Management I	(6)	(18)	Water Technology I
WTR215D	Water Treatment I	(5)	(21)	Water Microbiology I Water Technology I
WWT215D	Wastewater Treatment I	(5)	(21)	Water Microbiology I Water Technology I

TOTAL CREDITS FOR THE SEMESTER: 60

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
WAN316D	Water Analysis II	(6)	(12)	Water Analysis I Water Chemistry I
WCH316D	Water Chemistry II	(6)	(12)	Water Chemistry I
WTR316D	Water Treatment II	(6)	(18)	Water Treatment I
WWT316D	Wastewater Treatment II	(6)	(18)	Wastewater Treatment I
SECOND SEMESTER **On completion of all modules.**				
WIL316D	Work-Integrated Learning: Water Science and Technology	(6)	(60)	

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

8.11 ADVANCED DIPLOMA IN WATER SCIENCE AND TECHNOLOGY

AdvDip (Water Science and Technology) - NQF Level 7 (120 credits)

Qualification code: ADWS20

SAQA ID: 109015, CHE NUMBER: H/H16/E066CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):

A Diploma in Water Science and Technology, **or** a National Diploma: Water Care, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day and block-mode classes.

f. *Minimum duration:*
A minimum of one or two years (depending on the programme presentation).

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

Option 1: Day classes

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
PIU107V	Integrated Urban/Rural Water and Sanitation Research Project III	(7)	(21)

FIRST SEMESTER

DWS117V	Decentralised Water and Sanitation III	(7)	(9)
RWS117V	Introduction to Research	(7)	(12)
WTR117V	Advanced Water Treatment III	(7)	(15)

plus one of the following options:

Option 1: Management

WRM117V	Water Resource Management II	(7)	(12)
WUM117V	Water Utility Management II	(7)	(12)

Option 2: Analytical

WAN107V	Water Analyses III (year module)	(7)	(12)
WCH117V	Water Chemistry III	(7)	(12)

SECOND SEMESTER

GIW117V	Geographic Information System I	(7)	(12)
WWT117V	Advanced Wastewater Treatment III	(7)	(15)

plus one of the following electives:

LBG117V	Laboratory Management II	(7)	(12)

WCD117V	Water Distribution and Wastewater Collection III	(7)	(12)

TOTAL CREDITS FOR THE OPTION: **120**

Option 2: Block-mode classes

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT
FIRST SEMESTER			
DWS117V	Decentralised Water and Sanitation III	(7)	(9)
RWS117V	Introduction to Research	(7)	(12)
WTR117V	Advanced Water Treatment III	(7)	(15)
	plus one of the following options:		
Option 1: Management (only offered in the second year)			
WRM117V	Water Resource Management II (first-semester module)	(7)	(12)
WUM117V	Water Utility Management II (first-semester module)	(7)	(12)
Option 2: Analytical			
WAN107V	Water Analyses III (year module)	(7)	(12)
WCH117V	Water Chemistry III (first-semester module)	(7)	(12)
SECOND SEMESTER			
GIW117V	Geographic Information System I	(7)	(12)
WWT117V	Advanced Wastewater Treatment III	(7)	(15)

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT
PIU107V	Integrated Urban/Rural Water and Sanitation Research Project III	(7)	(21)
FIRST SEMESTER (modules from option 1 - see first year)			
WRM117V	Water Resource Management II	(7)	(12)
WUM117V	Water Utility Management II	(7)	(12)
SECOND SEMESTER one of the following electives:			
LBG117V	Laboratory Management II	(7)	(12)
WCD117V	Water Distribution and Wastewater Collection III	(7)	(12)

TOTAL CREDITS FOR THE OPTION: **120**

8.12 POSTGRADUATE DIPLOMA IN WATER SCIENCE AND TECHNOLOGY

PGDip (Water Science and Technology) - NQF Level 8 (120 credits)

Qualification code: PDWS21

SAQA ID: 110442, CHE NUMBER: H/H16/E075CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
An Advanced Diploma in Water Science and Technology, **or** a Baccalaureus Technologiae: Water Care, **or** a Bachelor's degree in Water Science, **or** an equivalent qualification at NQF Level 7 with 120 credits (subject to departmental approval). Preference will be given to applicants with an average of 60% or more in the previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Applicants will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes.

f. Minimum duration:
Two years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Research Project IV only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT
RWS108G	Research Methodology and Skills	(8)	(12)
WTP108G	Water Treatment Process Design IV	(8)	(24)
WWP108G	Wastewater Treatment Process Design IV	(8)	(24)
TOTAL CREDITS FOR THE FIRST YEAR:			**60**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT
REW108G	Research Project IV	(8)	(30)
REW118R	Research Project IV (re-registration) (first-semester module, see paragraph h)	(8)	(0)
	plus one of the following combinations:		
WAN108G	Advanced Water Analyses IV	(8)	(15)
WCH108G	Water Chemistry IV	(8)	(15)
	or		
WRM108G	Water Resources Management III	(8)	(15)
WSG108G	Water Services Management III	(8)	(15)
TOTAL CREDITS FOR THE SECOND YEAR:			**60**
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

8.13 MASTER OF APPLIED SCIENCES

MAppSci - NQF Level 9 (180 credits)

Qualification code: MDAP19

(Specialisation codes for admission and registration: MDEV19 / MDGE19 / MDWC19)

SAQA ID: 102024, CHE NUMBERS: H16/10784/HEQSF, H16/2442/HEQSF, H16/10792/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor's degree, **or** a baccalaureus technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. *Selection criteria:*
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of one year and a maximum of three years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Applied Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: MDEV19			
EVM109M	Dissertation: Environmental Sciences	(9)	(180)
EVM109R	Dissertation: Environmental Sciences (re-registration)	(9)	(0)
EVM119R	Dissertation: Environmental Sciences (re-registration) (semester module)	(9)	(0)
Option 2: MDGE19			
GEO109M	Dissertation: Geology	(9)	(180)
GEO109R	Dissertation: Geology (re-registration)	(9)	(0)
GEO119R	Dissertation: Geology (re-registration) (semester module)	(9)	(0)
Option 3: MDWC19			
WAC109M	Dissertation: Water Science and Technology	(9)	(180)
WAC109R	Dissertation: Water Science and Technology (re-registration)	(9)	(0)
WAC119R	Dissertation: Water Science and Technology (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

8.14 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation codes for admission and registration: PHEV17 / PHGE17 / PHWS17)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of two years and a maximum of four years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: PHEV17			
EM1010O	Thesis: Environmental Sciences	(10)	(360)
EM1010R	Thesis: Environmental Sciences (re-registration)	(10)	(0)
EM1110R	Thesis: Environmental Sciences (re-registration) (semester module)	(10)	(0)

Option 2: PHGE17

GE1010O	Thesis: Geology	(10)	(360)
GE1010R	Thesis: Geology (re-registration)	(10)	(0)
GE1110R	Thesis: Geology (re-registration) (semester module)	(10)	(0)

Option 3: PHWS17

WA1010O	Thesis: Water Science and Technology	(10)	(360)
WA1010R	Thesis: Water Science and Technology (re-registration)	(10)	(0)
WA1110R	Thesis: Water Science and Technology (re-registration) (semester module)	(10)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **360**

9. DEPARTMENT OF HORTICULTURE

9.1 DIPLOMA IN HORTICULTURE

Dip (Horticulture) - NQF Level 6 (360 credits)
Qualification code: DPHO20
SAQA ID: 100983, CHE NUMBER: H16/14298/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

  Admission requirement(s):
  A Senior Certificate or an equivalent qualification, with a E symbol at Higher Grade or a D symbol at Standard Grade for English, Mathematics, and Physical Science or Biology.

  Recommended subject(s):
  Agricultural Sciences.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24.**

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 3 for Mathematics or Technical Mathematics or 4 for Mathematical Literacy, and 3 for Life Sciences or 3 for Physical Sciences or Technical Sciences.

  Recommended subject(s):
  None.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **25** (with Mathematics or Technical Mathematics) or **26** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

b. Assessment procedure:
Applicants with the minimum APS will be considered for admission until the programme complement is full.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes.

f. Minimum duration:
Three years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. WIL Horticulture:
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
BOT105D	Botany I	(5)	(24)	
CPL105X	Computer Literacy	(5)	(10)	
EMP105D	Environmental Practices I	(5)	(18)	
HRP105D	Horticulture and Nursery Practice I	(5)	(30)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LFI125X	Life Skills I (block module)	(5)	(2)	
MST105X	Mathematics and Statistics	(5)	(12)	
SOI105D	Science for Occupational Purposes	(5)	(12)	
TOTAL CREDITS FOR THE FIRST YEAR:			**120**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
1SU206D	Plant Studies II	(6)	(24)	Botany I
BSP206D	Business Practice I	(6)	(12)	
EMP206D	Environmental Practices II	(6)	(18)	Environmental Practices I
HRP206D	Horticulture and Nursery Practice II	(6)	(42)	Horticulture and Nursery Practice I
LMT206D	Landscape Maintenance I	(6)	(24)	
TOTAL CREDITS FOR THE SECOND YEAR:			**120**	

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
1SU316D	Plant Studies III	(6)	(18)	Plant Studies II
HNP316D	Horticulture and Nursery Practice Management II	(6)	(12)	Business Practice I

HRP316D	Horticulture and Nursery Practice III	(6)	(30)	Horticulture and Nursery Practice II

TOTAL CREDITS FOR THE SEMESTER: 60

SECOND SEMESTER
After completion of all modules.
Students register for one of the following Work-Integrated Learning options. Placement is subjected to departmental evaluation and approval. WHI316D is subject to Industry memorandum of understanding (MOA).

WHI316D	WIL Horticulture (after completion of all modules)	(6)	(60)
WHO316D	WIL Horticulture (after completion of all modules)	(6)	(60)

TOTAL CREDITS FOR THE SEMESTER: 60

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

9.2 ADVANCED DIPLOMA IN HORTICULTURE

AdvDip (Horticulture) - NQF Level 7 (120 credits)
Qualification code: ADHO20
SAQA ID: 104463, CHE NUMBER: H/H16/E063CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
A Diploma in Horticulture, **or** a National Diploma: Horticulture, **or** a relevant Bachelor's degree in Horticulture, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes offered over six block cycles of one week each.

f. Minimum duration:
One year.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
HNT107V	Horticulture and Nursery Technology	(7)	(60)
HPM107V	Horticultural Production Management	(7)	(30)
HPP107V	Horticulture Project Principles	(7)	(30)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

9.3 POSTGRADUATE DIPLOMA IN HORTICULTURE

PGDip (Horticulture) - NQF Level 8 (120 credits)

Qualification code: PDHO21

SAQA ID: 104483, CHE NUMBER: H/H16/E100CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
An Advanced Diploma in Horticulture, **or** a Baccalaureus Technologiae: Horticulture, **or** a Bachelor's degree in the field of Horticulture, **or** an equivalent qualification at NQF Level 7 with 120 credits. Preference will be given to applicants with an average of 60% or more in the previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes.

f. Minimum duration:
One year.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Horticulture Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
HRD108G	Horticulture Project	(8)	(42)
HRD118R	Horticulture Project (re-registration) (first-semester module, see paragraph h)	(8)	(0)
HTE108G	Advanced Horticultural Technology	(8)	(48)
RHO108G	Research Methodology	(8)	(30)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

9.4 DIPLOMA IN LANDSCAPE TECHNOLOGY

Dip (Landscape Technology) - NQF Level 6 (360 credits)

Qualification code: DPLT20

SAQA ID: 100984, CHE NUMBER: H16/14301/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with a E symbol at Higher Grade or a D symbol at Standard Grade for English, Mathematics, and Physical Science or Biology.

Recommended subject(s):
Agricultural Sciences.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24**.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 3 for Mathematics or Technical Mathematics or 4 for Mathematical Literacy, and 3 for Life Sciences or 3 for Physical Sciences or Technical Sciences.

Recommended subject(s):
None.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **25** (with Mathematics or Technical Mathematics) or **26** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

b. Assessment procedure:
Applicants with the minimum APS will be considered for admission until the programme complement is full.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes.

f. Minimum duration:
Three years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. WIL in Landscape Technology I:
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
BOT105D	Botany I	(5)	(24)	
CLY105D	Construction in Landscape Technology I	(5)	(15)	
CPL105X	Computer Literacy	(5)	(10)	
DLT105D	Design in Landscape Technology I	(5)	(15)	
EMP105D	Environmental Practices I	(5)	(18)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LFI125X	Life Skills I (block module)	(5)	(2)	
MAS105X	Mathematics and Statistics I	(5)	(12)	
SOI105D	Science for Occupational Purposes	(5)	(12)	
TOTAL CREDITS FOR THE FIRST YEAR:			**120**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
1SU206D	Plant Studies II	(6)	(24)	Botany I
BSP206D	Business Practice I	(6)	(12)	
CLY206D	Construction in Landscape Technology II	(6)	(18)	Construction in Landscape Technology I Design in Landscape Technology I Design in Landscape Technology I
DLT206D	Design in Landscape Technology II	(6)	(24)	Construction in Landscape Technology I Design in Landscape Technology I Design in Landscape Technology I
EMP206D	Environmental Practices II	(6)	(18)	Environmental Practices I
LMT206D	Landscape Maintenance I	(6)	(24)	

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
1SU316D	Plant Studies III	(6)	(18)	Plant Studies II
CLY316D	Construction in Landscape Technology III	(6)	(10)	Construction in Landscape Technology II Design in Landscape Technology I Design in Landscape Technology II
DLT316D	Design in Landscape Technology III	(6)	(20)	Design in Landscape Technology II Construction in Landscape Technology II
LDM316D	Landscape Management II	(6)	(12)	Business Practice I

TOTAL CREDITS FOR THE SEMESTER: 60

SECOND SEMESTER

Students register for one of the following Work-Integrated Learning options. WLI316D is subject to Industry memorandum of understanding (MOA). Placement for WIL is subjected to a departmental evaluation and approval.

WLI316D	WIL in Landscape Technology I (after completion of all modules)	(6)	(60)
WLT316D	WIL in Landscape Technology I (after completion of all modules)	(6)	(60)

TOTAL CREDITS FOR THE SEMESTER: 60

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

9.5 ADVANCED DIPLOMA IN LANDSCAPE TECHNOLOGY

AdvDip (Landscape Technology) - NQF Level 7 (120 credits)

Qualification code: ADLT20

SAQA ID: 103086, CHE NUMBER: H/H16/E064CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
A Diploma in Landscape Technology, **or** a National Diploma: Landscape Technology, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes offered over six block cycles of one week each.

f. Minimum duration:
One year.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
DCL107V	Design and Construction in Landscape Technology	(7)	(60)
LTM107V	Landscape Technology Management	(7)	(30)
LTP107V	Landscape Technology Project Principles	(7)	(30)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

9.6 POSTGRADUATE DIPLOMA IN LANDSCAPE TECHNOLOGY

PGDip (Landscape Technology) - NQF Level 8 (120 credits)

Qualification code: PDLT21

SAQA ID: 117405, CHE NUMBER: H/H16/E159CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
An Advanced Diploma in Landscape Technology, **or** a Baccalaureus Technologiae: Landscape Technology, **or** a Bachelor's degree in the field of Landscape Technology, **or** an equivalent qualification at NQF Level 7 with 120 credits. Preference will be given to applicants with an average of 60% or more in the previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes.

f. Minimum duration:
One year.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Landscape Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
DCL108G	Design and Construction in Landscape Technology	(8)	(48)
ECR108G	Ecological Restoration	(8)	(30)
LNP108G	Landscape Project	(8)	(24)
LNP118R	Landscape Project (re-registration) (first-semester module, see Paragraph h)	(8)	(0)

RLT108G	Research Methodology	(8)	(18)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

9.7 MASTER OF AGRICULTURAL SCIENCE

MAgricSci - NQF Level 9 (180 credits)

Qualification code: MDAS19

(Specialisation code for admission and registration: MDHO19)

SAQA ID: 96889, CHE NUMBER: H16/2422/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
A Postgraduate Diploma in Agriculture, **or** a Baccalaureus Technologiae: Agriculture, **or** a Bachelor Honours degree in Agriculture from a South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. Selection criteria:
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of one year and a maximum of three years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Agricultural Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
HOR109M	Dissertation: Horticulture	(9)	(180)
HOR109R	Dissertation: Horticulture (re-registration)	(9)	(0)
HOR119R	Dissertation: Horticulture (re-registration) (semester module)	(9)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **180**

9.8 MASTER OF APPLIED SCIENCES

MAppSci - NQF Level 9 (180 credits)

Qualification code: MDAP19

(Specialisation codes for admission and registration: MDHT19 / MDLT19)

SAQA ID: 102024, CHE NUMBERS: H16/10784/HEQSF, H16/2442/HEQSF, H16/10792/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor's degree, **or** a baccalaureus technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. Selection criteria:
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of one year and a maximum of three years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Applied Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: MDHT19			
HRT109M	Dissertation: Horticulture	(9)	(180)
HRT109R	Dissertation: Horticulture (re-registration)	(9)	(0)
HRT119R	Dissertation: Horticulture (re-registration) (semester module)	(9)	(0)
Option 2: MDLT19			
LST109M	Dissertation: Landscape Technology	(9)	(180)
LST109R	Dissertation: Landscape Technology (re-registration)	(9)	(0)
LST119R	Dissertation: Landscape Technology (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

9.9 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation codes for admission and registration: PHHO17 / PHLT21)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. *Admission requirement(s):*
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of two years and a maximum of four years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: PHHO17			
HC1010O	Thesis: Horticulture	(10)	(360)
HC1010R	Thesis: Horticulture (re-registration)	(10)	(0)
HC1110R	Thesis: Horticulture (re-registration) (semester module)	(10)	(0)
Option 2: PHLT21			
LT1010O	Thesis: Landscape Technology	(10)	(360)
LT1010R	Thesis: Landscape Technology (re-registration)	(10)	(0)
LT1110R	Thesis: Landscape Technology (re-registration) (semester module)	(10)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**360**

10. DEPARTMENT OF MATHEMATICS AND STATISTICS

10.1 ADVANCED DIPLOMA IN QUALITY MANAGEMENT

AdvDip (Quality Management) - NQF Level 7 (120 credits)

Qualification code: ADQU20

SAQA ID: 111623, CHE NUMBER: H/H16/E181CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
Any relevant bachelor's degree or diploma from a South African university. Prospective students must currently be employed in a quality-related working environment with a minimum of two years' working experience.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes.

f. Minimum duration:
Two years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Research Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it should they fail the module.

Key to asterisks:
* The department strongly recommends that students register for Applied Statistics (APL107V) and Quality Management Systems (QMA107V) in their first year of registration.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
APL107V	Applied Statistics*	(7)	(24)	

QMA107V	Quality Management Systems*	(7)	(24)

FIRST SEMESTER

CQI117V	Continual Quality Improvement	(7)	(12)

SECOND SEMESTER

QAT117V	Quality Auditing Techniques	(7)	(12)
RQM117V	Introduction to Research Methodology	(7)	(12)

TOTAL CREDITS FOR THE FIRST YEAR: **84**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
RPQ107V	Research Project	(7)	(24)	Applied Statistics Introduction to Research Methodology
RPQ117R	Research Project (re-registration) (first-semester module, see paragraph h)	(7)	(0)	

FIRST SEMESTER

IGP117V	Integrated Project Management	(7)	(12)

TOTAL CREDITS FOR THE SECOND YEAR: **36**

TOTAL CREDITS FOR THE QUALIFICATION: **120**

10.2 POSTGRADUATE DIPLOMA IN QUALITY MANAGEMENT

PGDip (Quality Management) - NQF Level 8 (120 credits)

Qualification code: PDQU21

SAQA ID: 117385, CHE NUMBER: H/H16/E182CAN

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
An advanced diploma, **or** a baccalaureus technologiae, **or** a bachelor's degree, **or** an equivalent qualification in a related field of study at NQF Level 7 with 120 credits. Prospective students must currently be employed in a quality related working environment with a minimum of two years' work experience.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Block-mode classes.

f. *Minimum duration:*
Two years.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. *Re-registration:*
A student may re-register for the module Research Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it should they fail the module.

Key to asterisks:
* The department strongly recommends that students register for Quality Improvement Techniques (CQI) (QIT108G) in their first year of registration.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
IMS118G	Integrated Management Systems (first-semester module)	(8)	(12)	
EQU108G	Economics of Quality	(8)	(20)	
QIT108G	Quality Improvement Techniques (CQI)*	(8)	(24)	
TOTAL CREDITS FOR THE FIRST YEAR:			**56**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
PTQ118G	Advanced Philosophies and Theories of Quality (first-semester module)	(8)	(16)	
RQP108G	Research Project	(8)	(24)	Quality Improvement Techniques (CQI)
RQP118R	Research Project (re-registration) (first-semester module, see paragraph h)	(8)	(0)	
SQM108G	Strategic Quality Management	(8)	(24)	
TOTAL CREDITS FOR THE SECOND YEAR:			**64**	
TOTAL CREDITS FOR THE QUALIFICATION:			**120**	

10.3 MASTER OF APPLIED SCIENCES

MAppSci - NQF Level 9 (180 credits)

Qualification code: MDAP19

(Specialisation code for admission and registration: MDAM20)

SAQA ID: 102024, CHE NUMBERS: H16/10784/HEQSF, H16/2442/HEQSF, H16/10792/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor's degree, **or** a baccalaureus technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. Selection criteria:
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of one year and a maximum of three years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Applied Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
AMA109M	Dissertation: Applied Mathematics	(9)	(180)
AMA109R	Dissertation: Applied Mathematics (re-registration)	(9)	(0)
AMA119R	Dissertation: Applied Mathematics (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

10.4 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation code for admission and registration: PHMT17)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of two years and a maximum of four years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
MA1010O	Thesis: Mathematical Technology	(10)	(360)
MA1010R	Thesis: Mathematical Technology (re-registration)	(10)	(0)
MA1110R	Thesis: Mathematical Technology (re-registration) (semester module)	(10)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**360**

11. DEPARTMENT OF NATURE CONSERVATION

11.1 DIPLOMA IN NATURE CONSERVATION

Dip (Nature Conservation) - NQF Level 6 (360 credits)
Qualification code: DPNC20
SAQA ID: 112485, CHE NUMBER: H/H16/E128CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with a D symbol at Standard Grade for English and either Biology, Physical Science or Mathematics.

Recommended subject(s):
None.

Selection criteria:
Assessment is based on the normal M-score with a weighted Swedish scale.

SYMBOL	HG VALUE	SG VALUE
A	6	5
B	5	4
C	4	3
D	3	2
E	2	1

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24.**

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), and 3 for Mathematics or Technical Mathematics or 4 for Mathematical Literacy.

Recommended subject(s):
Agricultural Sciences, Geography, Life Sciences, Physical Sciences or Technical Sciences.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24** (with Mathematics or Technical Mathematics) or **25** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

  Admission requirement(s):
  A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 50% for English (home language or first additional language) and 40% for Mathematics or 50% Mathematical Literacy, 40% for Life Orientation (excluded for APS calculation) and 50% for any other three compulsory vocational subjects.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24** (with Mathematics or Technical Mathematics) or **25** (with Mathematical Literacy).

b. *Assessment procedure(s):*
Applicants with the minimum APS will be considered for admission until the programme complement is full.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes.

f. *Minimum duration:*
Three years.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. *Training excursions, field trips and practicals:*
Training excursions, field trips and practical classes are compulsory and involve additional expenses, over and above the class fees. Basic camping equipment is also required. Students will be provided with further details at registration.

i. *General:*
It is compulsory to wear the required uniform during certain practical classes. Uniforms may also be worn to class and to practicals. Students will be provided with details about uniforms at registration. The nature of the training involves a degree of risk, and although all reasonable precautions are taken by the University and the Department to prevent accidents and injuries, it is recommended that students take out insurance. More information is available at registration.

j. *Work-Integrated Learning I:*
See Chapter 5 of Students' Rules and Regulations. Registration for Work-Integrated Learning (WIL) is in January only. Due to the seasonal nature of the field work component, the offering of modules as well as the management cycle of the service providers, no other registration dates are permitted. The Department will facilitate interviews and applications for WIL with service providers from September to December in the student's second year of studies. The WIL service provider must be approved by the Department.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
ALN105D	Administration and Legislation I	(5)	(12)	
ANS105D	Animal Studies I	(5)	(24)	
CEY105D	Conservation Ecology I	(5)	(18)	
INF125D	Information Literacy (block module)	(5)	(3)	
LFS125X	Life Skills (block module)	(5)	(2)	
LIT105D	Computer Literacy	(5)	(9)	
PSU105D	Plant Studies I	(5)	(24)	
RSG105D	Resource Management I	(5)	(18)	
TOTAL CREDITS FOR THE FIRST YEAR:			**120**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
ANS206D	Animal Studies II	(6)	(24)	Animal Studies I
CCO206D	Conservation Communication I	(6)	(18)	
CEY206D	Conservation Ecology II	(6)	(18)	Conservation Ecology I
ESC206D	Earth Science I	(6)	(18)	
PSU206D	Plant Studies II	(6)	(24)	Plant Studies I
RSG206D	Resource Management II	(6)	(18)	Resource Management I
TOTAL CREDITS FOR THE SECOND YEAR:			**120**	

THIRD YEAR
After completion of all modules.

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
WNC306D	Work-Integrated Learning I	(6)	(120)	
TOTAL CREDITS FOR THE THIRD YEAR:			**120**	
TOTAL CREDITS FOR THE QUALIFICATION:			**360**	

11.2 ADVANCED DIPLOMA IN NATURE CONSERVATION

AdvDip (Nature Conservation) - NQF Level 7 (120 credits)

Qualification code: ADNC20

SAQA ID: 110053, CHE NUMBER: H/H16/E147CAN

Campus where offered: Pretoria Campus

REMARKS

a. *Admission requirement(s):*
A Diploma in Nature Conservation, **or** a National Diploma: Nature Conservation, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Block-mode classes. Blocks comprise four compulsory week-long blocks per annum (excluding examinations) – usually one in January, one in April, one in July and one in October.

f. *Minimum duration:*
One year.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
ANS107V	Animal Studies III	(7)	(24)
PSU107V	Plant Studies III	(7)	(24)
RNC107V	Research Methodology I	(7)	(18)
RSG107V	Resource Management III	(7)	(18)
	plus two of the following electives:		
AQS107V	Aquatic Science I	(7)	(18)
CCO107V	Conservation Communication II	(7)	(18)
FNC107V	Financial Management I	(7)	(18)
MPI107V	Management Principles I	(7)	(18)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

11.3 POSTGRADUATE DIPLOMA IN CONSERVATION MANAGEMENT

PGDip (Conservation Management) - NQF Level 8 (120 credits)

Qualification code: PDCF24

SAQA ID: 120884, CHE NUMBER: H/H16/E212CAN

Campus where offered: Pretoria Campus

REMARKS

a. *Admission requirement(s):*
An Advanced Diploma, **or** a Bachelor's degree, **or** a Baccalaureus Technologiae in Nature Conservation or Wildlife Management, **or** an equivalent qualification at NQF Level 7.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Applicants who meet the minimum entrance requirements will be selected by a Departmental Selection Panel. Applicants who achieved an average mark of 60% or above for their NQF level 7 qualification will be shortlisted and invited for an interview by a Departmental Selection Panel. The interview questions and criteria will be based on the exit level outcomes and assessment criteria of the NQF level 7 qualification, as well as other questions that are relevant to succeeding.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Block-mode classes.

f. *Minimum duration:*
One year.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
ANS108G	Animal Studies IV	(8)	(24)
CVM108G	Conservation Management I	(8)	(24)
PSU108G	Plant Studies IV	(8)	(24)
RCF108G	Research Methodology II	(8)	(24)
RSG108G	Resource Management IV	(8)	(24)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

11.4 DIPLOMA IN WILDLIFE MANAGEMENT

Dip (Wildlife Management) - NQF Level 6 (360 credits)

Qualification code: DPWI20

SAQA ID: 115551, CHE NUMBER: H/H16/E130CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with a D symbol at Standard Grade for English and either Biology, Physical Science or Mathematics.

Recommended subject(s):
None.

Selection criteria:
Assessment is based on the normal M-score with a weighted Swedish scale.

SYMBOL	HG VALUE	SG VALUE
A	6	5
B	5	4
C	4	3
D	3	2
E	2	1

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24.**

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), and 3 for Mathematics or Technical Mathematics or 4 for Mathematical Literacy.

Recommended subject(s):
Agricultural Sciences, Geography, Life Sciences, Physical Sciences or Technical Sciences.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24** (with Mathematics or Technical Mathematics) or **25** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):
A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 50% for English (home language or first additional language) and 40% for Mathematics or 50% Mathematical Literacy, 40% for Life Orientation (excluded for APS calculation) and 50% for any other three compulsory vocational subjects.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24** (with Mathematics or Technical Mathematics) or **25** (with Mathematical Literacy).

b. Assessment procedure(s):
Applicants with the minimum APS will be considered for admission until the programme complement is full.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes.

f. Minimum duration:
Three years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Training excursions, field trips and practicals:
Training excursions, field trips and practical classes are compulsory and involve additional expenses, over and above the class fees. Basic camping equipment is also required. Students will be provided with further details at registration.

i. General:
It is compulsory to wear the required uniform during certain practical classes. Uniforms may also be worn to class and to practicals. Students will be provided with details about uniforms at registration. The nature of the training involves a degree of risk, and although all reasonable precautions are taken by the University and the Department to prevent accidents and injuries, it is recommended that students take out insurance. More information is available at registration.

j. Work-Integrated Learning I:
See Chapter 5 of Students' Rules and Regulations. Registration for Work-Integrated Learning (WIL) is in January only. Due to the seasonal nature of the field work component, the offering of modules as well as the management cycle of the service providers, no other registration dates are permitted. The Department will facilitate interviews and applications for WIL with service providers from September to December in the student's second year of studies. The WIL service provider must be approved by the Department.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
INF125D	Information Literacy (block module)	(5)	(3)	

LFS125X	Life Skills (block module)	(5)	(2)
LIT105D	Computer Literacy	(5)	(9)
WEY105D	Wildlife Ecology I	(5)	(24)
WLC105D	Wildlife Economics I	(5)	(24)
WLS105D	Wildlife Science I	(5)	(24)
WMG105D	Wildlife Management I	(5)	(24)

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
EHS206D	Earth Science I	(6)	(18)	
RSC205D	Rangeland Science I	(5)	(18)	
WLC206D	Wildlife Economics II	(6)	(24)	Wildlife Economics I
WLS206D	Wildlife Science II	(6)	(24)	Wildlife Science I
WMG206D	Wildlife Management II	(6)	(24)	Wildlife Management I
	plus one of the following electives (after completing any three of the following electives: Wildlife Ecology I, Wildlife Economics I, Wildlife Management I, Wildlife Science I):			
LMG206D	Lodge Management I	(6)	(12)	
WUT206D	Wildlife Utalization I	(6)	(12)	

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR
After completion of all modules.

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
WWI306D	Work-Integrated Learning I	(6)	(120)	

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

11.5 ADVANCED DIPLOMA IN WILDLIFE MANAGEMENT

AdvDip (Wildlife Management) - NQF Level 7 (120 credits)

Qualification code: ADWI21

SAQA ID: 115433, CHE NUMBER: H/H16/E149CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s)

A Diploma in Wildlife Management, **or** a National Diploma: Game Ranch Management, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Selection is based on an assessment by a departmental selection panel. Applicants showing academic potential (and who completed the National Diploma or Diploma in a satisfactory time frame (3-4 years) and subsequently achieved the relevant body of knowledge might be admitted into the programme.

All completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Block-mode classes. These blocks comprise four compulsory week-long blocks per annum (excluding examinations) – usually one in January, one in April, one in July and one in October.

f. *Minimum duration:*
One year.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
RWI107V	Research Methodology I	(7)	(18)
SWI107V	Strategic Management I	(7)	(18)
WLC107V	Wildlife Economics III	(7)	(18)
WLS107V	Wildlife Science III	(7)	(24)
WMG107V	Wildlife Management III	(7)	(24)
WTQ107V	Wildlife Techniques I	(7)	(18)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

11.6 MASTER OF APPLIED SCIENCES

MAppSci - NQF Level 9 (180 credits)

Qualification code: MDAP19

(Specialisation codes for admission and registration: MDNC19 / MDWM21)

SAQA ID: 102024, CHE NUMBERS: H16/10784/HEQSF, H16/2442/HEQSF, H16/10792/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor degree, **or** a baccalaureus technologiae degree from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. Selection criteria:
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of one year and a maximum of three years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Applied Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: MDNC19			
NAT109M	Dissertation: Nature Conservation	(9)	(180)
NAT109R	Dissertation: Nature Conservation (re-registration)	(9)	(0)
NAT119R	Dissertation: Nature Conservation (re-registration) (semester module)	(9)	(0)
Option 2: MDWM21			
WIM109M	Dissertation: Wildlife Management	(9)	(180)
WIM109R	Dissertation: Wildlife Management (re-registration)	(9)	(0)
WIM119R	Dissertation: Wildlife Management (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

11.7 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation codes for admission and registration: PHNC17 / PHWI17)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. *Admission requirement(s):*
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of two years and a maximum of four years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: PHNC17			
NC1010O	Thesis: Nature Conservation	(10)	(360)
NC1010R	Thesis: Nature Conservation (re-registration)	(10)	(0)
NC1110R	Thesis: Nature Conservation (re-registration) (semester module)	(10)	(0)
Option 2: PHWI17			
WM1010O	Thesis: Wildlife Management	(10)	(360)
WM1010R	Thesis: Wildlife Management (re-registration)	(10)	(0)
WM1110R	Thesis: Wildlife Management (re-registration) (semester module)	(10)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**360**

12. DEPARTMENT OF PHARMACEUTICAL SCIENCES

12.1 ADVANCED DIPLOMA IN PHARMACEUTICAL SCIENCES

AdvDip (Pharmaceutical Sciences) - NQF Level 7 (132 credits)

Qualification code: ADPS20

SAQA ID: 110727, CHE NUMBER: H/H16/E091CAN

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
Any relevant NQF Level 6 Health- or Pharmaceutical Sciences-related degree or diploma from a South African university or any relevant three-year bachelor's degree or a three-year diploma with at least two years' experience in the pharmaceutical industry.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection by a departmental selection panel. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Block-mode classes offered on Saturdays.

f. *Minimum duration:*
A minimum of one or two years (depending on the student's registration).

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

Students who register for full-time block-mode classes should register for all modules in one academic year.

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT
BPY107V	Biopharmaceutics and Pharmacology	(7)	(24)
CRS107V	Clinical Research	(7)	(24)
QMD107V	Quality of Medicines	(7)	(24)
TOTAL CREDITS FOR THE FIRST YEAR:			**72**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT
MGO107V	Medicine Governance	(7)	(24)
PHD107V	Pharmaceutical Development Process	(7)	(24)
RPS107V	Introduction to Research Methodology: Pharmaceutical Sciences	(7)	(12)
TOTAL CREDITS FOR THE SECOND YEAR:			**60**
TOTAL CREDITS FOR THE QUALIFICATION:			**132**

12.2 POSTGRADUATE DIPLOMA IN PHARMACEUTICAL SCIENCES

PGDip (Pharmaceutical Sciences) - NQF Level 8 (120 credits)

Qualification code: PDPS21

SAQA ID: 111128, CHE NUMBER: H/H16/E165CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
Any relevant NQF Level 7 Health- or Pharmaceutical Sciences-related degree with two years' work experience, **or** an Advanced Diploma in Pharmaceutical Sciences, **or** a Professional Bachelor's degree in Pharmacy. Preference will be given to applicants with an average of 60% or more in the previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes offered on Saturdays.

f. Minimum duration:
A minimum of one or two years (depending on the student's registration).

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Research Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

Students who register for full-time block-mode classes should register for all modules in one academic year.

YEAR MODULES (FIRST OR SECOND YEAR)
Modules are offered as determined by the Department.

CODE	MODULE	NQF-L	CREDIT
BEB108G	Basic Applied Epidemiology and Biostatistics	(8)	(12)
HAM108G	Health Care Administration Management II	(8)	(12)
HEC108G	Health Economics	(8)	(12)
RLS108G	Research Methodology in Life Sciences	(8)	(12)
RJP108G	Research Project	(8)	(30)
RJP108R	Research Project (re-registration) (first-year module, see paragraph h)	(8)	(0)
	plus one of the following electives:		
CRS108G	Clinical Research	(8)	(42)
MRS108G	Medicines Regulatory Science	(8)	(42)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

12.3 BACHELOR OF PHARMACY

BPharm - NQF Level 8 (480 credits)

Qualification type: Professional Bachelor's Degree

Qualification code: BPPH01

SAQA ID: 90565, CHE NUMBER: H/H16/E016CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

  Admission requirement(s):
  A Senior Certificate with a matriculation endorsement or equivalent qualification, with at least a D symbol at Higher Grade, or a B symbol at Standard Grade for English, Mathematics, Physical Science and Biology. Applicants with Botany and/or Physiology in place of Biology will also be considered.

  If an applicant obtained a relevant qualification at NQF Level 7 at another higher education institution, the academic department may use its own discretion to evaluate the applicant.

  Selection criteria:
  Applicants who comply with the above requirements will be invited for the TUT potential assessment and an interview with a departmental panel.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree endorsement (four subjects with a minimum score of 4 in each) or equivalent recognised qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics, or Technical Mathematics 4 for Physical Sciences or Technical Sciences, 4 for Life Sciences and 4 for two other subjects (excluding Life Orientation).

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

  Assessment procedure(s):
  - Applicants who comply with the above requirements will be invited for the TUT potential assessment and an interview with a departmental panel.
  - Applicants with a score of 32 or more will be given preference for admission subject to availability of space.

- **FOR APPLICANTS WITH ANY RELEVANT NQF LEVEL 7 QUALIFICATION:**

  If an applicant obtained a relevant qualification at NQF Level 7 at another higher education institution, the academic department may use its own discretion to evaluate the applicant.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day classes offered in blocks as determined by the Department.

e. *Minimum duration:*
Four years.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

g. *General information for registration with the South African Pharmacy Council (SAPC):*
All students admitted to the first year of study must register with the SAPC before 30 June of the relevant year. Please contact the academic department for further information.

CURRICULUM

Modules are offered in blocks as determined by the Department.

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT
ATM145P	From Atoms to Molecules	(5)	(15)
IBP145P	Introduction to Biopharmaceutics, Pharmacokinetics and Pharmacodynamics	(6)	(21)
MMM145P	Microorganisms, Man and Medicines	(6)	(21)
MTM145P	From Molecules to Medicines	(6)	(21)
NAG145P	Nutrition and Gastroenterology	(6)	(21)
OPP145P	Orientation and Introduction to the Practice of Pharmacy in South Africa	(5)	(21)

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR
After completion of all first-year modules.

CODE	MODULE	NQF-L	CREDIT
CAP245P	Cardiovascular Pharmacy	(8)	(18)
IPL246P	Industrial Pharmacy Work-Based Learning	(7)	(18)
IPP246P	Industrial Pharmacy Practice	(6)	(18)
PHL246P	Primary Health Care Work-Based Learning	(6)	(18)
PPP246P	Principles and Practice of Pharmaceutical Manufacturing: Medicines Production on the Large Scale	(7)	(18)
RSE246P	Respiratory System, Ear and Eye	(7)	(30)

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR
After completion of all second-year modules.

CODE	MODULE	NQF-L	CREDIT
CPL347P	Community Pharmacy Work-Based Learning	(8)	(18)
CPP347P	Community Pharmacy Practice: Community-Based Pharmaceutical Care	(7)	(30)
EAR347P	Endocrinology and Reproduction	(7)	(21)
MTH347P	Modern Technologies in Health Care	(7)	(18)
NSS347P	Neuromuscular and Skeletal Systems, Skin, Inflammation and Pain Management	(7)	(21)
SPP347P	Sterile Pharmaceutical Products	(7)	(12)

TOTAL CREDITS FOR THE THIRD YEAR: **120**

FOURTH YEAR
After completion of all third-year modules.

CODE	MODULE	NQF-L	CREDIT
HPC448P	Hospital-Based Pharmaceutical Care and First-Aid	(8)	(21)
HPL448P	Hospital Pharmacy Work-Based Learning	(8)	(21)
NPP448P	Neurological and Psychiatric Pharmacy	(7)	(24)
RIP448P	Advanced Research Methodology and Project (year module)	(8)	(30)
SPH448P	Specialised Pharmacy and Hospital Pharmacy Practice	(8)	(24)
TOTAL CREDITS FOR THE FOURTH YEAR:			**120**
TOTAL CREDITS FOR THE QUALIFICATION:			**480**

12.4 MASTER OF PHARMACEUTICAL SCIENCES

MPharmSci - NQF Level 9 (180 credits)
Qualification code: MDPS19
SAQA ID: 96917, CHE NUMBER: H16/2513/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. *Admission requirement(s):*
A Postgraduate Diploma in Pharmaceutical Sciences, **or** a Baccalaureus Technologiae: Pharmaceutical Sciences, **or** any Pharmaceutical Sciences-related Postgraduate Diploma, **or** professional bachelor degree, **or** a bachelor honours degree from a South African university.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

Candidates with a professional baccalaureus technologiae degree may articulate directly into the Master's programme.

b. *Selection criteria:*
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies - the procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of one year and a maximum of three years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

CODE	MODULE	NQF-L	CREDIT
PSC109M	Dissertation: Pharmaceutical Sciences	(9)	(180)
PSC109R	Dissertation: Pharmaceutical Sciences (re-registration)	(9)	(0)
PSC119R	Dissertation: Pharmaceutical Sciences (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

12.5 DIPLOMA IN SOMATIC THERAPY

Dip (Somatic Therapy) - NQF Level 6 (360 credits)

Qualification code: DPST19

SAQA ID: 100987, CHE NUMBER: H16/14297/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with at least a D symbol at Standard Grade for English, Biology and Mathematics. Subjects with an E symbol at Higher Grade will also be considered.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **22**.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), and 4 for Mathematics or Technical Mathematics or 5 for Mathematical Literacy and 4 for Life Sciences.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **22** (with Mathematics or Technical Mathematics) or **23** (with Mathematical Literacy). Life Orientation is excluded from the APS calculation.

b. Assessment procedure(s):
- Applicants with a score of 22 to 23 will be required to write a TUT potential assessment test and will be interviewed by a departmental panel.
- Applicants with an APS of 24 and more will be considered for admission without an academic proficiency test, but will be interviewed by a departmental selection panel.

The APS will contribute 50% to the final admission score and the interview will contribute 50%. A minimum score of 5/10 will be required of the candidate to be successful in the interview and students with the highest scores might be selected. Please note that meeting the minimum requirements does not guarantee admission.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes.

f. Minimum duration:
Three years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. WIL in Somatic Therapy I and II:
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
APS105D	Anatomy and Physiology I	(5)	(12)	
CPL105X	Computer Literacy	(5)	(10)	
HCT105D	Holistic and Complementary Therapy I	(5)	(24)	

INI125D	Information Literacy I (block module)	(5)	(2)
LFI125X	Life Skills I (block module)	(5)	(2)
NUT105D	Nutrition I	(5)	(12)
SET105D	Somatic Exercise Therapy I	(5)	(12)
SOR105D	Science for Occupational Purpose I	(5)	(12)
STT105D	Skilled Touch Principles and Techniques I	(5)	(24)

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
APS206D	Anatomy and Physiology II	(6)	(12)	Anatomy and Physiology I
BSP206D	Business Practice I	(6)	(12)	
HCT206D	Holistic and Complementary Therapy II	(6)	(24)	Anatomy and Physiology I Holistic and Complementary Therapy I Nutrition I
NUT206D	Nutrition II	(6)	(12)	Nutrition I
SET206D	Somatic Exercise Therapy II	(6)	(12)	Somatic Exercise Therapy I
SOP206D	Socio-Psychology I	(6)	(12)	
STT206D	Skilled Touch Principles and Techniques II	(6)	(24)	Anatomy and Physiology I Nutrition I Skilled Touch Principles and Techniques I
WSM206D	WIL in Somatic Therapy I	(6)	(12)	Holistic and Complementary Therapy I Skilled Touch Principles and Techniques I Somatic Exercise Therapy I

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
BSP306D	Business Practice II	(6)	(12)	Business Practice I
GMI306D	General Microbiology I	(6)	(12)	Anatomy and Physiology II Science for Occupational Purpose I
GPA306D	General Pharmacology	(6)	(12)	Anatomy and Physiology II Science for Occupational Purpose I
HCT306D	Holistic and Complementary Therapy III	(6)	(15)	Anatomy and Physiology II Holistic and Complementary Therapy II Nutrition II
NUT306D	Nutrition III	(6)	(12)	Nutrition II
SOP306D	Socio-Psychology II	(6)	(12)	Socio-Psychology I
STT306D	Skilled Touch Principles and Techniques III	(6)	(15)	Anatomy and Physiology II Nutrition II Skilled Touch Principles and Techniques II

WSM306D	WIL in Somatic Therapy II	(6)	(30)	Holistic and Complementary Therapy II Skilled Touch Principles and Techniques II Somatic Exercise Therapy II WIL in Somatic Therapy I

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

12.6 ADVANCED DIPLOMA IN SOMATIC THERAPY

AdvDip (Somatic Therapy) - NQF Level 7 (120 credits)

Qualification code: ADST20

SAQA ID: 110041, CHE NUMBER: H/H16/E092CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
A National Diploma: Somatology, **or** a Diploma in Somatic Therapy, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection by a departmental selection panel. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes.

f. Minimum duration:
One year.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
HAM107V	Health Care Administration and Management I	(7)	(12)

HCT107V	Holistic and Complementary Therapy IV	(7)	(30)
IST107V	Introduction to Research I: Somatic Therapy	(7)	(12)
NUT107V	Nutrition IV	(7)	(12)
STT107V	Skilled Touch Principles and Techniques IV	(7)	(30)
STY107V	Clinical Management in Somatic Therapy IV	(7)	(24)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

12.7 POSTGRADUATE DIPLOMA IN SOMATIC THERAPY

PGDip (Somatic Therapy) - NQF Level 8 (120 credits)

Qualification code: PDST21

SAQA ID: 115554, CHE NUMBER: H/H16/E161CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
An Advanced Diploma in Somatic Therapy, **or** a Baccalaureus Technologiae: Somatology, **or** a Bachelor's degree in the field of Somatology, **or** an equivalent qualification at NQF Level 7 with 120 credits. Preference will be given to applicants with an average of 60% or more in the previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject by a departmental selection panel. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes.

f. Minimum duration:
One year.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Re-registration:
A student may re-register for the module Somatic Research Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
HCM108G	Health Care Administration and Management II	(8)	(24)
RBS118G	Research Methodology and Bio-Statistics I (first-semester module)	(8)	(12)
SCR108G	Somatic Research Project	(8)	(24)
SCR118R	Somatic Research Project (re-registration) (first-semester module, see paragraph h)	(8)	(0)
STY108G	Somatic Therapy	(8)	(24)
SYP108G	Somatic Therapy in Practice	(8)	(36)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

12.8 MASTER OF HEALTH SCIENCES

MHealthSci - NQF Level 9 (180 credits)

Qualification code: MDHS19

(Specialisation code for admission and registration: MDST19)

SAQA ID: 96890, CHE NUMBER: H16/11150/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):

A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor's degree, **or** a baccalaureus technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:

- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. Selection criteria:

Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from

the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of one year and a maximum of three years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Health Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
STY109M	Dissertation: Somatic Therapy	(9)	(180)
STY109R	Dissertation: Somatic Therapy (re-registration)	(9)	(0)
STY119R	Dissertation: Somatic Therapy (re-registration) (semester module)	(9)	(0)

TOTAL CREDITS FOR THE QUALIFICATION: **180**

12.9 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation code for admission and registration: PHPS17 / PHST21)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of two years and a maximum of four years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: PHPS17			
PH1010O	Thesis: Pharmaceutical Sciences	(10)	(360)
PH1010R	Thesis: Pharmaceutical Sciences (re-registration)	(10)	(0)
PH1110R	Thesis: Pharmaceutical Sciences (re-registration) (semester module)	(10)	(0)
Option 2: PHST21			
ST1010O	Thesis: Somatic Therapy	(10)	(360)
ST1010R	Thesis: Somatic Therapy (re-registration)	(10)	(0)
ST1110R	Thesis: Somatic Therapy (re-registration) (semester module)	(10)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**360**

13. DEPARTMENT OF PHYSICS

13.1 DIPLOMA IN FIRE TECHNOLOGY

Dip (Fire Technology) - NQF Level 6 (360 credits)

Qualification code: DPFI19 / DPFI21

SAQA ID: 100988, CHE NUMBER: H16/14273/HEQSF (contact), H/H16/E094CAN (distance education)

Campus where offered: Arcadia Campus and Distance Education

Please note that this programme is only offered to Fire and Rescue Services personnel.

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification and three years' relevant work experience, HAZMAT Awareness, Fire Fighter I, HAZMAT Operational, and Fire Fighter II certificates. Applicants must submit proof of employment in the form of an official letter from the employer.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification and three years' relevant work experience, HAZMAT Awareness, Fire Fighter I, HAZMAT Operational, and Fire Fighter II certificates. Applicants must submit proof of employment in the form of an official letter from the employer.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):
A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, (APS of 4) for English (home language or first additional language), 40% for Mathematics or 50% for Mathematical Literacy, 40% for Life Orientation (excluded for APS calculation) and 50% for any other two compulsory vocational subjects and three years' relevant work experience, HAZMAT Awareness, Fire Fighter I, HAZMAT Operational, and Fire Fighter II certificates. Applicants must submit proof of employment in the form of an official letter from the employer.

- **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE/NATIONAL SENIOR CERTIFICATE AS PUBLISHED IN REPORT 191: N3 (NQF LEVEL 4):**

  Admission requirement(s):
  A National Senior Certificate or a National N Certificate with languages as published in Report 191: N3 (NQF Level 4) issued by both the Department of Higher Education and Training (DHET) and the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% for English, 50% for Mathematics N3, 50% for Engineering Sciences N3 and any other two additional subjects and three years' relevant work experience, HAZMAT Awareness, Fire Fighter I, HAZMAT Operational, and Fire Fighter II certificates. Applicants must submit proof of employment in the form of an official letter from the employer.

b. Selection criteria and assessment procedure(s):
No further assessment will be done. Applicants who meet the minimum requirements might be considered. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
- Arcadia Campus: block-mode classes offered over a minimum of three years.
- Distance education: online block-mode classes with limited contact classes per module per semester at Cape Town or Durban service points. Programme is offered over a minimum of four years. Contact classes include tests, examination, tutorials and/or practicals.

f. Minimum duration:
A minimum of three or four years (depending on the programme presentation).

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. WIL in Fire Technology I and II:
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

OPTION 1: ARCADIA CAMPUS (DPFI19)

FIRST YEAR

CODE	MODULE	NQF-I	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
CPL105X	Computer Literacy	(5)	(10)	
GCH105D	General Chemistry I	(5)	(24)	
GPH105D	General Physics I	(5)	(24)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LFI125X	Life Skills I (block module)	(5)	(2)	
MAS105X	Mathematics and Statistics I	(5)	(12)	

FIRST SEMESTER

FTE115D	Fire Technology I	(5)	(12)

SECOND SEMESTER

EMG115D	Emergency Management I	(5)	(12)
FCO115D	Building Construction I	(5)	(12)

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
EXF216D	WIL in Fire Technology I (first- or second-semester module)	(6)	(30)	
FCH216D	Fire Chemistry II	(6)	(12)	General Chemistry I
FCO216D	Building Construction II	(6)	(12)	Building Construction I
FPH216D	Fire Physics II	(6)	(18)	General Physics I
TOTAL CREDITS FOR THE SEMESTER:			72	
SECOND SEMESTER				
EMG216D	Emergency Management II	(6)	(12)	Emergency Management I
FHY216D	Fire Hydraulics II	(6)	(18)	
FTE216D	Fire Technology II	(6)	(18)	Fire Technology I
TOTAL CREDITS FOR THE SEMESTER:			48	
TOTAL CREDITS FOR THE SECOND YEAR:			**120**	

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
EXF316D	WIL in Fire Technology II (first- or second-semester module)	(6)	(30)	WIL in Fire Technology I
FCO316D	Building Construction III	(6)	(12)	Building Construction II
FHY316D	Fire Hydraulics III	(6)	(15)	Fire Hydraulics II
FTE316D	Fire Technology III	(6)	(24)	Fire Technology II
TOTAL CREDITS FOR THE SEMESTER:			81	
SECOND SEMESTER				
EMG316D	Emergency Management III	(6)	(12)	Emergency Management II
FCH316D	Fire Chemistry III	(6)	(15)	Fire Chemistry II
FPH316D	Fire Physics III	(6)	(12)	Fire Physics II
TOTAL CREDITS FOR THE SEMESTER:			39	
TOTAL CREDITS FOR THE THIRD YEAR:			**120**	
TOTAL CREDITS FOR THE QUALIFICATION:			**360**	

OPTION 2: DISTANCE EDUCATION (DPFI21)

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105U	Communication for Academic Purposes	(5)	(10)	
CPL105U	Computer Literacy	(5)	(10)	
GCH105U	General Chemistry I	(5)	(24)	
MAS105U	Mathematics and Statistics I	(5)	(12)	
SECOND SEMESTER				
EMG115U	Emergency Management I	(5)	(12)	
TOTAL CREDITS FOR THE FIRST YEAR:			**68**	

SECOND YEAR

CODE	MODULE	NQF-I	CREDIT	PREREQUISITE MODULE(S)
GPH105U	General Physics I	(5)	(24)	
INI125U	Information Literacy I (block module)	(5)	(2)	
LFI125U	Life Skills I (block module)	(5)	(2)	
FIRST SEMESTER				
FTE115U	Fire Technology I	(5)	(12)	
SECOND SEMESTER				
FCO115U	Building Construction I	(5)	(12)	
TOTAL CREDITS FOR THE SECOND YEAR:			**52**	

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
EXF216U	WIL in Fire Technology I (first- or second-semester module)	(6)	(30)	
FCH216U	Fire Chemistry II	(6)	(12)	General Chemistry I
FCO216U	Building Construction II	(6)	(12)	Building Construction I
FPH216U	Fire Physics II	(6)	(18)	General Physics I
TOTAL CREDITS FOR THE SEMESTER:			72	
SECOND SEMESTER				
EMG216U	Emergency Management II	(6)	(12)	Emergency Management I
FHY216U	Fire Hydraulics II	(6)	(18)	
FTE216U	Fire Technology II	(6)	(18)	Fire Technology I
TOTAL CREDITS FOR THE SEMESTER:			48	
TOTAL CREDITS FOR THE THIRD YEAR:			**120**	

FOURTH YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
EXF316U	WIL in Fire Technology II (first- or second-semester module)	(6)	(30)	WIL in Fire Technology I
FCO316U	Building Construction III	(6)	(12)	Building Construction II
FHY316U	Fire Hydraulics III	(6)	(15)	Fire Hydraulics II
FTE316U	Fire Technology III	(6)	(24)	Fire Technology II
TOTAL CREDITS FOR THE SEMESTER:			81	
SECOND SEMESTER				
EMG316U	Emergency Management III	(6)	(12)	Emergency Management II
FCH316U	Fire Chemistry III	(6)	(15)	Fire Chemistry II
FPH316U	Fire Physics III	(6)	(12)	Fire Physics II
TOTAL CREDITS FOR THE SEMESTER:			39	
TOTAL CREDITS FOR THE FOURTH YEAR:			**120**	
TOTAL CREDITS FOR THE QUALIFICATION:			**360**	

13.2 ADVANCED DIPLOMA IN FIRE TECHNOLOGY

AdvDip (Fire Technology) - NQF Level 7 (120 credits)

Qualification code: ADFI20

SAQA ID: 111619, CHE NUMBER: H/H16/E070CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
A National Diploma: Fire Technology, **or** a Diploma in Fire Technology **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Block-mode classes.

f. Minimum duration:
One year.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

SEMESTER MODULES

CODE	MODULE	NQF-L	CREDIT
FIRST SEMESTER			
EMG117V	Emergency Management IV	(7)	(18)
FMG117V	Financial Management II	(7)	(18)
FPH117V	Fire Physics IV	(7)	(24)
TOTAL CREDITS FOR THE SEMESTER:			60
SECOND SEMESTER			
FCH117V	Fire Chemistry IV	(7)	(24)
FTE117V	Fire Technology IV	(7)	(18)
PES117V	Psychology: Emergency Services II	(7)	(18)
TOTAL CREDITS FOR THE SEMESTER:			60
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

13.3 POSTGRADUATE DIPLOMA IN FIRE TECHNOLOGY

PGDip (Fire Technology) - NQF Level 8 (120 credits)
Qualification code: PDFI24
SAQA ID: 120843, CHE NUMBER: H/H16/E223CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
An Advanced Diploma, **or** a Baccalaureus Technologiae, **or** a Bachelor's degree in Fire Technology from a South African university, **or** an equivalent qualification at NQF Level 7 with 120 credits at a recognised South African or foreign institution.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Block-mode classes.

f. *Minimum duration:*
Two years.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. *Re-registration:*
A student may re-register for the module Research Project in Fire Technology only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT
FTI108G	Professional Practice in Fire Technology Investigations	(8)	(18)
FIRST SEMESTER			
FSL118G	Fire Service Legislation	(8)	(12)
RTF118G	Research Methodology (Theory)	(8)	(12)
SECOND SEMESTER			
RFS118G	Research Methodology (Statistics)	(8)	(12)
TOTAL CREDITS FOR THE FIRST YEAR:			**54**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT
FHY108G	Fire Hydraulics IV	(8)	(18)
FIRST SEMESTER			
FMI118G	Fire Management Information Systems	(8)	(12)

RFI118G	Research Project in Fire Technology	(8)	(18)
RFI118R	Research Project in Fire Technology (re-registration) (second-semester module, see paragraph h)	(8)	(0)

SECOND SEMESTER

DFP118G	Disaster and Fire Defence Planning	(8)	(18)

TOTAL CREDITS FOR THE SECOND YEAR: **66**

TOTAL CREDITS FOR THE QUALIFICATION: **120**

13.4 DIPLOMA IN INDUSTRIAL PHYSICS

Dip (Industrial Physics) - NQF Level 6 (360 credits)

Qualification code: D3IP13

SAQA ID: 88122, CHE NUMBER: H/H16/E015CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with an E symbol (40-49%) at Higher Grade or a D symbol (50-59%) at Standard Grade for English, Physical Science and Mathematics.

Selection criteria:
Prospective students are assessed by means of the following formula for academic merit, based on scholastic performance:

Formula for determination of APS:

SYMBOL	HG VALUE	SG VALUE
A	8	7
B	7	6
C	6	5
D	5	4
E	4	2

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (six subjects).

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics and 4 for Physical Sciences or Technical Sciences.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **21** (excluding Life Orientation).

  Assessment procedure(s):
  Applicants with a final APS of 24 and more will be considered for admission. Applicants with a score of 21 to 23 will be invited to write an academic proficiency test. The APS will contribute 80% to the final admission score and the academic proficiency test 20%.

b. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

c. *Intake for the qualification:*
January only.

d. *Presentation:*
Day classes.

e. *Minimum duration:*
Three years.

f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

g. *Work-Integrated Learning I:*
See Chapter 5 of Students' Rules and Regulations.

h. *Textbooks:*
Textbooks and other educational material will be required.

Key to asterisks:
* Information does not correspond to information on AA72.
(Deviations approved by the Senate in June 2015 and September 2015.)

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CSKH500	Computer Skills I	(5)	(10)	
GLCH500	General Chemistry IA	(5)	(27)	
GLPH500	General Physics IA	(5)	(27)	
LSKH501	Life Skills (block module)	(5)	(2)	
MATH500	Mathematics I	(5)	(20)	

FIRST SEMESTER

COSH501	Communication Skills I	(5)	(9)	
ENDH501	Engineering Drawing I	(5)	(15)	

SECOND SEMESTER

ISPH501	Industrial Physics I	(5)	(10)

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CPPH500	Computer Programming I	(5)	(15)	Computer Skills I General Physics IA Mathematics I
ISPH600	Industrial Physics II	(6)	(30)	General Physics IA Industrial Physics I Mathematics I
MATH600	Mathematics II	(6)	(20)	General Physics IA Mathematics I
MTSH500	Material Science I	(5)	(20)	General Chemistry IA General Physics IA
	plus one of the following electives:			
NCTH500	Nuclear Technology I	(5)	(25)	General Chemistry IA General Physics IA Industrial Physics I Mathematics I
PTNH500	Photonics I	(5)	(25)	General Chemistry IA General Physics IA Industrial Physics I Mathematics I
SECOND SEMESTER				
ELPH501	Electronics Principles I	(5)	(10)	General Physics IA

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
FIRST SEMESTER				
ISP306R	Industrial Physics III	(6)*	(20)	Industrial Physics II
MTLH501	Metrology I	(5)	(10)	General Physics IA Mathematics I
MTSH601	Material Science II	(6)	(15)	Material Science I
	plus one of the following electives:			
NCTH601	Nuclear Technology II	(6)	(15)	Nuclear Technology I
PTNH601	Photonics II	(6)	(15)	Photonics I

SECOND SEMESTER

EXPH601	Work-Integrated Learning I	(6)*	(60)	Photonics II **or** Nuclear Technology II

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

13.5 ADVANCED DIPLOMA IN INDUSTRIAL PHYSICS

AdvDip (Industrial Physics) - NQF Level 7 (120 credits)

Qualification code: ADIP19

(Specialisation codes for admission and registration: ADIO19 / ADNT19)

SAQA ID: 102065, CHE NUMBER: H/H16/E056CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
A three-year Diploma/National Diploma in Industrial Physics (on NQF Level 6), **or** a three-year bachelor of science degree with a Physics major, **or** any three-year diploma/national diploma with a Physics major (on NQF Level 6 with a minimum of 360 credits).

b. Selection criteria:
Admission is subject to selection. Qualifying applicants will be admitted based on their average final-year mark of their preceding qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day or evening classes. (The offering of evening classes is subject to sufficient capacity and will be offered over a period of two years).

f. Minimum duration:
A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
APA107V	Advanced Physics I (year module)	(7)	(24)

ELM117V	Electromagnetism (first-semester module)	(7)	(12)
IPA107V	Industrial Physics IV (year module)	(7)	(30)

plus all modules in one of the following options:

Option 1: Nuclear Technology (ADNT19)

ANB117V	Accelerators and Nuclear Reactors I (second-semester module)	(7)	(12)
ORP107V	Occupational Radiation Protection I (year module)	(7)	(18)
RPD107V	Radiation Protection Dosimetry I (year module)	(7)	(24)

Option 2: Photonics (ADIO19)

LFO107V	Laser and Fibre Optics I (year module)	(7)	(24)
OPD107V	Optical Design I (year module)	(7)	(18)
RPB117V	Radiometry and Photometry (second-semester module)	(7)	(12)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

13.6 POSTGRADUATE DIPLOMA IN INDUSTRIAL PHYSICS

PGDip (Industrial Physics) - NQF Level 8 (120 credits)

Qualification code: PDIP22

(Specialisation codes for admission and registration: PDIO22 / PDNT22)

SAQA ID: 111157, CHE NUMBER: H/H16/E095CAN

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
An Advanced Diploma in Industrial Physics, **or** a three-year bachelor's degree with Physics as a major, **or** an equivalent qualification at NQF Level 7.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. *Presentation:*
Block-mode classes. The offering of the two-year block-mode classes will only be offered to working students and is subject to sufficient capacity.

f. *Minimum duration:*
A minimum of one or two years (depending on the programme presentation).

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

h. *Re-registration:*
A student may re-register for the module Industrial Physics Research Project only with the permission of the Head of the Department. The purpose of the re-registration is to provide students with an opportunity to complete the project only, and not to redo it, should they fail the module.

CURRICULUM

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
FIRST SEMESTER			
IDV118G	Industrial Ventilation II	(8)	(12)
QSS118G	Quantum and Solid State Physics II	(8)	(12)
SECOND SEMESTER			
ATN118G	Analytical Techniques for Nanotechnology	(8)	(12)
PHO118G	Photovoltaic Technology	(8)	(12)

plus all modules in one of the following options: Students should have the necessary underbuild on NQF Level 7 for the chosen option:

Option 1: Nuclear Technology (PDNT22)

ANB108G	Accelerators and Nuclear Reactors II (year module)	(8)	(18)
NTR108G	Industrial Physics Research Project (year module)	(8)	(36)
NTR118R	Industrial Physics Research Project (re-registration) (first-semester module, see paragraph h)	(8)	(0)
RPD108G	Radiation Protection Dosimetry II (year module)	(8)	(18)

Option 2: Photonics (PDIO22)

IOR108G	Industrial Physics Research Project (year module)	(8)	(36)
IOR118R	Industrial Physics Research Project (re-registration) (first-semester module, see paragraph h)	(8)	(0)

LFO108G	Laser and Fibre Optics II (year module)	(8)	(18)
OPD108G	Optical Design II (year module)	(8)	(18)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

13.7 MASTER OF APPLIED SCIENCES

MAppSci - NQF Level 9 (180 credits)

Qualification code: MDAP19

(Specialisation codes for admission and registration: MDFI19 / MDIP19)

SAQA ID: 102024, CHE NUMBERS: H16/10784/HEQSF, H16/2442/HEQSF, H16/10792/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor's degree, **or** a baccalaureus technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. Selection criteria:
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January and July.

e. Presentation:
Research.

f. Duration:
A minimum of one year and a maximum of three years.

g. Rules on postgraduate studies:
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Applied Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: MDFI19			
FRT109M	Dissertation: Fire Technology	(9)	(180)
FRT109R	Dissertation: Fire Technology (re-registration)	(9)	(0)
FRT119R	Dissertation: Fire Technology (re-registration) (semester module)	(9)	(0)
Option 2: MDIP19			
IPH109M	Dissertation: Industrial Physics	(9)	(180)
IPH109R	Dissertation: Industrial Physics (re-registration)	(9)	(0)
IPH119R	Dissertation: Industrial Physics (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

13.8 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation codes for admission and registration: PHFI20 / PHIP20)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Arcadia Campus

REMARKS

a. Admission requirement(s):
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.
Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of two years and a maximum of four years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: PHFI20			
FR1010O	Thesis: Fire Technology	(10)	(360)
FR1010R	Thesis: Fire Technology (re-registration)	(10)	(0)
FR1110R	Thesis: Fire Technology (re-registration) (semester module)	(10)	(0)
Option 2: PHIP20			
IP1010O	Thesis: Industrial Physics	(10)	(360)
IP1010R	Thesis: Industrial Physics (re-registration)	(10)	(0)
IP1110R	Thesis: Industrial Physics (re-registration) (semester module)	(10)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**360**

14. DEPARTMENT OF SPORT, REHABILITATION AND DENTAL SCIENCES

14.1 BACHELOR OF HEALTH SCIENCE IN BIOKINETICS

BHSci (Biokinetics) - NQF Level 8 (480 credits)

Qualification type: Professional Bachelor's Degree

Qualification code: BPBK24

SAQA ID: 109415, CHE NUMBER: H/H16/E107CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

Admission requirement(s):
A Senior Certificate with a matriculation endorsement or equivalent qualification, with an E symbol at Higher Grade, or C symbol at Standard Grade for English, Mathematics, Physical Science and Biology or Physiology.

Selection criteria:
To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24**.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate or an equivalent qualification, with a bachelor's degree endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics, 4 for Physical Sciences or Technical Sciences and 4 for Life Sciences.

Selection criteria:
To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

b. Assessment procedure(s):
The selection process will consist of the following phases:
- Phase 1: an administrative screening process of the academic performance score (APS) of each student. This score will contribute a weight of 50% to the overall selection process.
- Phase 2: if the APS is 24 and above, the applicant will proceed to write a selection test that will have a weight of 50%. Selection to be done in accordance with the Health Professional Council of South Africa (HPCSA).

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes.

f. Minimum duration:
Four years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Biokinetics Practice I - IV (WIL)
See Chapter 5 of Students' Rules and Regulations.

i. Other requirements:
Immunisation against Hepatitis B is compulsory. A valid first-aid certificate is required. The University will arrange a first-aid programme in the first year. International students will be assessed by the Department to determine enrolment for this qualification.

j. Special qualification rules:
Special qualification rules apply, and students who register for this qualification will receive the rules with their letter of acceptance. It is the students' own responsibility to familiarise themselves with those rules.

k. Professional registration with HPCSA:
The student must register with the HPCSA for the duration of their studies. The student enrolls in their first year as a student Biokineticist (BKS), and upon completion of the qualification, the graduate may register as an independent, registered Biokinetics practitioner.

CURRICULUM

Key to asterisks:
* Information does not correspond to SAQA registration certificate as per SAQA ID: 109415. (The deviations are pending final approval by SAQA.)

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
BKP105P	Biokinetics Practice I (WIL)*	(5)	(10)	
CPL105X	Computer Literacy	(5)	(10)	
CVA105P	Clinical Exercise Testing and Evaluation I*	(5)	(28)	
HAN105P	Human Anatomy I	(5)	(18)	
HPY105P	Human Physiology I	(5)	(18)	
LFS125X	Life Skills (block module)	(5)	(2)	
NUT105P	Nutrition I	(5)	(12)	
FIRST SEMESTER				
MLH116P	Motor Learning and Human Development I	(6)	(6)	
SECOND SEMESTER				
RPR115P	Research Principles I	(5)	(6)	
TOTAL CREDITS FOR THE FIRST YEAR:			**120**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
BKP206P	Biokinetics Practice II (WIL)*	(6)	(10)	Human Anatomy I Human Physiology I Biokinetics Practice I (WIL) Clinical Exercise and Evaluation I
CVA206P	Clinical Exercise Testing and Evaluation II*	(6)	(29)	Clinical Exercise Testing and Evaluation I Human Physiology I
HAN206P	Human Anatomy II	(6)	(18)	Human Anatomy I
HPY206P	Human Physiology II	(6)	(18)	Human Physiology I
NMR206P	Neuro-Musculoskeletal Rehabilitation I*	(6)	(12)	Human Anatomy I Human Physiology I Motor Learning and Human Development I
PSY206P	Psychosocial Science	(6)	(12)	
TPR206P	Therapeutic Recreation	(6)	(15)	

FIRST SEMESTER

RPR216P	Research Principles II	(6)	(12)	Research Principles I

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
AEX307P	Applied Exercise Physiology I*	(7)	(24)	Human Physiology II
BKP307P	Biokinetics Practice III (WIL)*	(7)	(35)	Biokinetics Practice II (WIL) Clinical Exercise Testing and Evaluation II Neuro-Musculoskeletal Rehabilitation I
CVA307P	Clinical Exercise Testing and Evaluation III*	(7)	(13)	Clinical Exercise Testing and Evaluation II Human Physiology II
DTA307P	Data Analysis	(7)	(12)	Research Principles II
HAM307P	Health Care Administration and Management I	(7)	(12)	
NMR307P	Neuro-Musculoskeletal Rehabilitation II*	(7)	(12)	Human Anatomy II Neuro-Musculoskeletal Rehabilitation I

SECOND SEMESTER

MBR315P	Medical Law, Bio-Ethics and Human Rights	(5)	(6)	
PMY315P	Pharmacology	(5)	(6)	

TOTAL CREDITS FOR THE THIRD YEAR: **120**

FOURTH YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
CVA408P	Clinical Exercise Testing and Evaluation IV*	(8)	(18)	Clinical Exercise Testing and Evaluation III

BPK408P	Biokinetics Practice IV (WIL)*	(8)	(45)	Biokinetics Practice III (WIL) Clinical Exercise Testing and Evaluation III Neuro-Musculoskeletal Rehabilitation II
HAM408P	Health Care Administration and Management II	(8)	(12)	Health Care Administration and Management I
NMR408P	Neuro-Musculoskeletal Rehabilitation III*	(8)	(9)	Neuro-Musculoskeletal Rehabilitation II
RBK408P	Research Project	(8)	(30)	Clinical Exercise Testing and Evaluation III Neuro-Musculoskeletal Rehabilitation II Data Analysis Medical Law, Bio-Ethics and Human Rights

FIRST SEMESTER

PSE418P	Professional Standards and Ethics	(8)	(6)

TOTAL CREDITS FOR THE FOURTH YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **480**

14.2 BACHELOR OF HEALTH SCIENCE IN MEDICAL ORTHOTICS AND PROSTHETICS

BHSci (Medical Orthotics and Prosthetics) - NQF Level 8 (480 credits)

Qualification type: Professional Bachelor's Degree

Qualification code: BPOP20

SAQA ID: 111160, CHE NUMBER: H/H/16/E102CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL DIPLOMA AT NQF LEVEL 6:**

Applicants who completed a relevant national diploma (at NQF Level 6) and who graduated and proceeded to work in industry can apply. Applicants should follow an articulation process in which exemption will be granted for 50% of the credits of the completed (and conferred) national diploma. Detailed information on the process to follow is available at the relevant academic department.

- **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

  Admission requirement(s):
  A Senior Certificate with a matriculation endorsement or equivalent qualification, with a minimum of a D symbol at the Higher Grade, or C symbol at the Standard Grade for the following subjects: English, Mathematics, Physical Science and Biology or Physiology.

  Selection criteria:
  To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24**.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate or an equivalent qualification, with a bachelor's degree endorsementor an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 4 for Life Sciences, 4 for Mathematics or Technical Mathematics and 4 for Physical Sciences or Technical Sciences.

  Selection criteria:
  To be considered for this qualification, candidates must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

b. Assessment procedure(s):
For 2024: The selection process will consist of the following phases:
- Phase 1: An administrative screening process of the academic performance score (APS) of each student. This score will contribute a weight of 50% to the overall selection process.
- Phase 2: If the APS is above 27, the applicant will proceed to the interview and dexterity test that will have a weight of 50% (30% for the dexterity test and 20% for the interview).
- Phase 3: If APS is between 24 and 27 the applicant will write a TUT potential assessment with a 20% score weight. The applicant with minimum potential test score of 50% will be interviewed and will complete the dexterity test. In this case, the dexterity skills evaluation will contribute 15% to the overall score and the interview will contribute 5%.

As from 2025: The selection process will consist of the following phases:
- Phase 1: An administrative screening process of the academic performance score (APS) of each student. This score will contribute a weight of 40% to the overall selection process.
- Phase 2: If the APS is above 27, the applicant will proceed to the interview, dexterity test and Portfolio of evidence (POE) that will have a weight of 60% (25% for the dexterity test and 15% for the interview and 20% for a Portfolio of evidence). The portfolio of evidence (POE) are the acknowledgment letter from at least one private or one public center in the industry where the applicant shadowed for at least two days before the selection process. The applicant can bring along the POE to the interview.
- Phase 3: If APS is between 24 and 27 the applicant will write a TUT potential assessment with a 40% score weight. The applicant with minimum potential test score of 50% will be interviewed and will complete the dexterity test, interview and POE. The dexterity test will have a weight of 25%, the interview a weight of 15% and the POE a weight of 20%.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes.

f. Minimum duration:
Four years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. Other requirements:
Immunisation against Hepatitis B is compulsory in the first-year of study. A valid first-aid certificate is required. The University will arrange a first-aid programme in the first year. International students will be assessed by the Department to determine enrolment for this qualification.

i. Special qualification rules:
Special qualification rules apply, and students who register for this qualification will receive the rules with their letter of acceptance. It is the students' own responsibility to familiarise themselves with those rules.

j. Registration as a medical orthotist and prosthetist with the HPCSA:
On meeting the qualification requirements for the Bachelor of Health Sciences in Medical Orthotics and Prosthetics, the graduate will be with the HPCSA as a practitioner in the category Independent Practice. No students, while registered at TUT are allowed to work in the industry, as prescribed by the HPCSA, unless it forms part of clinical placement.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
BPC105P	Basic Principles of Engineering (CAD)	(5)	(14)	
CPL105X	Computer Literacy	(5)	(10)	
HAN105P	Human Anatomy I	(5)	(18)	
HPY105P	Human Physiology I	(5)	(18)	
LFS125X	Life Skills (block module)	(5)	(2)	
MST105X	Mathematics and Statistics	(5)	(12)	
POP105P	Principles of Orthotics and Prosthetics I	(5)	(12)	

FIRST SEMESTER

BPE115P	Basic Principles of Engineering (Manufacturing)	(5)	(14)	
CHI115P	Chemistry for Health Sciences	(5)	(12)	
PHN115P	Physics for Health Sciences	(5)	(12)	
RPI115P	Research Principles I	(5)	(6)	

TOTAL CREDITS FOR THE FIRST YEAR: **140**

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
BMI205P	Biomechanics	(5)	(18)	Human Anatomy I Human Physiology I
HAN206P	Human Anatomy II	(6)	(18)	Human Anatomy I
HPY206P	Human Physiology II	(6)	(18)	Human Physiology I
OPC206P	Orthotics and Prosthetics Practice I	(6)	(26)	Basic Principles of Engineering (CAD) Basic Principles of Engineering (Manufacturing) Principles of Orthotics and Prosthetics I

OPT206P	Orthotics and Prosthetics Material Sciences	(6)	(12)	Principles of Orthotics and Prosthetics I
POT206P	Principles of Orthotics II	(6)	(14)	Principles of Orthotics and Prosthetics I Basic Principles of Engineering (CAD) Basic Principles of Engineering (Manufacturing)
POU206P	Principles of Prosthetics II	(6)	(14)	Principles of Orthotics and Prosthetics I Basic Principles of Engineering (CAD) Basic Principles of Engineering (Manufacturing)
PSS206P	Psycho-Social Science I	(6)	(12)	

SECOND SEMESTER

RPI216P	Research Principles II	(6)	(12)	Research Principles I

TOTAL CREDITS FOR THE SECOND YEAR: **144**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
DTA307P	Data Analysis	(7)	(12)	Research Principles II
HAM307P	Health Care Administration and Management I	(7)	(12)	
OPC307P	Orthotics and Prosthetics Practice II	(7)	(26)	Orthotics and Prosthetics Practice I Principles of Orthotics II Principles of Prosthetics II
ORY307P	Orthopaedic Pathology	(7)	(12)	Human Anatomy II Human Physiology II
POT307P	Principles of Orthotics III	(7)	(20)	Orthotics and Prosthetics Practice I Principles of Orthotics II Principles of Prosthetics II
POU307P	Principles of Prosthetics III	(7)	(20)	Orthotics and Prosthetics Practice I Principles of Orthotics III Principles of Prosthetics II
PSS306P	Psycho-Social Science II	(6)	(12)	Psycho-Social Science I

SECOND SEMESTER

MBR315P	Medical Law, Bio-Ethics and Human Rights	(5)	(6)	
PMY315P	Pharmacology	(5)	(6)	

TOTAL CREDITS FOR THE THIRD YEAR: **126**

FOURTH YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
HAM408P	Health Care Administration and Management II	(8)	(12)	Health Care Administration and Management I

OPC408P	Orthotics and Prosthetics Practice III *(on completion of all first- second- and third-year modules)*	(8)	(72)
POP408P	Principles of Orthotics and Prosthetics IV *(on completion of all first- second- and third-year modules)*	(8)	(36)

TOTAL CREDITS FOR THE FOURTH YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **530**

14.3 HIGHER CERTIFICATE IN DENTAL ASSISTING

HCert (Dental Assisting) - NQF Level 5 (120 credits)

Qualification code: HCDA01

SAQA ID: 97176, CHE NUMBER: H16/2519/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):
A Senior Certificate or an equivalent qualification, with a D symbol at Standard Grade or an E symbol at Higher grade for English, or a D symbol at Standard Grade or an E symbol at higher grade for Mathematics.

Recommended subject(s):
Biology, Physical Science and Physiology.

Selection criteria:
Assessment is based on a TUT potential assessment and a personal interview.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **18**.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate with a higher certificate endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 3 for Mathematics (or 4 for Mathematical Literacy), and 3 for any other additional subjects.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **18** (excluding Life Orientation).

Assessment procedure(s):
- Applicants with an APS of at least 18 will be invited for a potential assessment and an interview with the departmental selection panel.
- Applicants with a minimum of one year's relevant working experience as a Dental Assistant, with an Admission Point Score (APS) of 18 will also be considered.
- Applicants with a minimum of one years' relevant working experience as a Dental Assistant, with an Admission Point Score (APS) lower than 18 may also be admitted through Recognition of Prior Learning (RPL).

b. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

c. Intake for the qualification:
January only.

d. Presentation:
Day classes offered over one year, block mode classes offered over two years. Block-mode classes are only applicable to students already employed at a dental practice.

e. Minimum duration:
A minimum of one or two years (depending on the programme presentation).

f. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

g. Other requirements:
A valid first-aid certificate. First-aid programmes are arranged by the University. Immunisation against Hepatitis B is compulsory.

h. Work-Integrated Learning:
See Chapter 5 of Students' Rules and Regulations.

CURRICULUM

YEAR MODULES

CODE	MODULE	NQF-L	CREDIT
DAP105C	Dental Assisting Practical I	(5)	(21)
DPM105C	Dental Practice Management I	(5)	(21)
OAP105C	Oral Anatomy and Pathology I	(5)	(20)
TDA105C	Dental Assisting Theory: Dental Assisting I	(5)	(12)
TDR105C	Dental Assisting Theory: Dental Radiography I	(5)	(10)
WDA105C	Work-Integrated Learning	(5)	(36)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

14.4 DIPLOMA IN DENTAL TECHNOLOGY

Dip (Dental Technology) - NQF Level 6 (360 credits)

Qualification code: DPDT24

SAQA ID: 100989, CHE NUMBER: H16/14275/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

- **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

  Admission requirement(s):
  A Senior Certificate or an equivalent qualification with a pass at Standard Grade in one of the following combinations: Mathematics and Physical Science, **or** Mathematics and Biology or Physiology, **or** Physical Science and Biology or Physiology.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 3 for Mathematics or Technical Mathematics or 4 for Mathematical Literacy, and 3 for Life Sciences or 3 for Physical Sciences or Technical Sciences.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **19** (with Mathematics or Technical Mathematics) or **20** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

b. Assessment procedure(s):
Selection is done in accordance with the South African Dental Technicians Council. Selection takes place in four steps. The weight of each step is given in brackets.

- Step 1: Academic performance (40%);
- Step 2: Potential assessment (20%);
- Step 3: Dexterity test (30%); and
- Step 4: Personal interview (10%).

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
*D*ay classes.

f. Minimum duration:
Three years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

h. WIL in Dental Technology III:
See Chapter 5 of Students' Rules and Regulations.

i. Other requirements:
- Immunisation against Hepatitis B is compulsory.
- Students should have access to computers and the Internet.
- Students should register with the South African Dental Technicians Council; this will be done by the Department.
- Students must obtain approved first-aid certificates to be admitted to the third-year examinations of the National Diploma. First-aid programmes are usually arranged by the Department.
- Faculty and statutory rules and regulations will apply to students who register for this qualification. It is the responsibility of the students to familiarise themselves with these rules and regulations.
- In addition to tuition fees and textbooks, an amount of approximately R30 000 for personal instruments will be required. These will remain the property of the student. Students are responsible for purchasing these instruments themselves.

j. Special qualification rules:
Special qualification rules apply, and students who register for this qualification will receive the rules with their letter of acceptance. It is the students' own responsibility to familiarise themselves with those rules.

CURRICULUM

Key to asterisks:

* Information does not correspond to SAQA registration certificate as per SAQA ID: 100989. (The deviations are pending final approval by SAQA.)

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
APD105D	Applied Dental Technology I	(5)	(39)*	
CPL105X	Computer Literacy	(5)	(10)	
DET105D	Dental Technology Theory I	(5)	(21)*	
DMS105D	Dental Materials Science I	(5)	(12)	
INL125X	Information Literacy (block module)	(5)	(2)	
LFS125X	Life Skills (block module)	(5)	(2)	
OAT105D	Oral Anatomy and Tooth Morphology	(5)	(24)	
TOTAL CREDITS FOR THE FIRST YEAR:			**120**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
APD206D	Applied Dental Technology II*	(6)	(54)*	Applied Dental Technology I Dental Materials Science I Dental Technology Theory I

DET206D	Dental Technology Theory II	(6)	(36)*	Applied Dental Technology I Dental Materials Science I Dental Technology Theory I
DMS206D	Dental Materials Science II	(6)	(15)	Applied Dental Technology I Dental Materials Science I Dental Technology Theory I
JUR205D	Jurisprudence	(5)	(15)	

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
1SP305D	Business Practice I	(5)	(12)	
APD306D	Applied Dental Technology III	(6)	(39)*	Applied Dental Technology II Dental Materials Science II Dental Technology Theory II
DME306D	Dental Materials Science III	(6)	(6)*	Applied Dental Technology II Dental Materials Science II Dental Technology Theory II
DTT306D	Dental Technology Theory III	(6)	(15)	Applied Dental Technology II Dental Materials Science II Dental Technology Theory II
WDY326D	WIL in Dental Technology III (block module)	(6)	(48)*	Applied Dental Technology II Dental Materials Science II Dental Technology Theory II

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

14.5 ADVANCED DIPLOMA IN DENTAL TECHNOLOGY

AdvDip (Dental Technology) - NQF Level 7 (120 credits)

Qualification code: ADDT20

SAQA ID: 111257, CHE NUMBER: H/H16/E119CAN

Campus where offered: Pretoria Campus

Please note that this programme will have no new intakes until further notice.

REMARKS

a. Admission requirement(s):
A Diploma in Dental Technology, **or** a National Diploma: Dental Technology, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection by a departmental selection panel. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Block-mode classes.

f. Minimum duration:
One year.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
BPR107V	Business Practice	(7)	(12)
CBR107V	Crown and Bridge	(7)	(18)
MRD107V	Metal Partial Dentures	(7)	(18)
ORD107V	Orthodontics	(7)	(12)
PSH107V	Prosthetics	(7)	(18)
FIRST SEMESTER			
CPO117V	Communication for Occupational Purposes	(7)	(6)
DMS117V	Dental Materials Science	(7)	(6)
JUR117V	Jurisprudence	(7)	(6)
OPH117V	Oral Physiology and Pathology	(7)	(6)
RDT117V	Research	(7)	(12)
SECOND SEMESTER			
MXP117V	Maxillofacial Prosthetics	(7)	(6)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

14.6 DIPLOMA IN KINESIOLOGY AND COACHING SCIENCE

Dip (Kinesiology and Coaching Science) - NQF Level 6 (360 credits)
Qualification code: DPKS20
SAQA ID: 103089, CHE NUMBER: H/H16/E078CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s) and selection criteria:

- **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

  Admission requirement(s):
  A Senior Certificate or an equivalent qualification, with a D symbol at Standard Grade for English.

Recommended subject(s):
Biology or Physiology.

Selection criteria:
Applicants with a minimum M-score will be considered for admission until the programme complement is full.

SYMBOL	HG VALUE	SG VALUE
A	7	6
B	6	5
C	5	4
D	4	3
E	3	2
F	2	1

To be considered for this qualification, applicants must have an Admission Points Score (APS) of at least **24**.

- **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE IN OR AFTER 2008:**

Admission requirement(s):
A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 3 for English (home language or first additional language), 3 for Mathematics or Technical Mathematics or 4 for Mathematical Literacy, and 3 for Life Sciences.

Recommended subject(s):
None.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **24** (excluding Life Orientation).

b. Assessment procedure(s):
Applicants with the minimum APS will be considered for admission until the programme complement is full. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes.

f. Minimum duration:
Three years.

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
CPL115X	Computer Literacy (second-semester module)	(5)	(10)	
FSP105D	Foundations of Sport Coaching Sciences I	(5)	(20)	
HAN105D	Human Anatomy I	(5)	(12)	
HPH105D	Human Physiology I	(5)	(12)	
INL125X	Information Literacy (block module)	(5)	(2)	
LFS125X	Life Skills (block module)	(5)	(2)	
SPL105D	Sport Practical I	(5)	(20)	
SPS105D	Sport Studies I	(5)	(12)	
SSC105D	Sport Science I	(5)	(20)	
TOTAL CREDITS FOR THE FIRST YEAR:			**120**	

SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
BMH205D	Biomechanics I	(5)	(18)	Human Anatomy I Human Physiology I
COC206D	Coaching Science II	(6)	(18)	Foundations of Sport Coaching Sciences I
EXE206D	Exercise Anatomy and Physiology I	(6)	(18)	Human Anatomy I Human Physiology I
MLH216D	Motor Learning and Human Development I (first-semester module)	(6)	(6)	
PSS205D	Psycho-Social Sciences I	(5)	(12)	
SPL206D	Sport Practical II	(6)	(24)	Sport Practical I
SPS216D	Sport Studies II (second-semester module)	(6)	(6)	Sport Studies I
SSC206D	Sport Science II	(6)	(18)	Sport Science I
TOTAL CREDITS FOR THE SECOND YEAR:			**120**	

THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
APV315D	Adaptive Physical Activity I (first-semester module)	(5)	(6)	
COC306D	Coaching Science III	(6)	(20)	Coaching Science II
EXE306D	Exercise Anatomy and Physiology II	(6)	(18)	Exercise Anatomy and Physiology I
NUT305D	Nutrition I	(5)	(12)	
SEP306D	Sport and Exercise Psychology I	(6)	(18)	Psycho-Social Sciences I
SPL306D	Sport Practical III	(6)	(26)	Sport Practical II
SSC306D	Sport Science III	(6)	(20)	Sport Science II
TOTAL CREDITS FOR THE THIRD YEAR:			**120**	
TOTAL CREDITS FOR THE QUALIFICATION:			**360**	

14.7 ADVANCED DIPLOMA IN KINESIOLOGY AND COACHING SCIENCE

AdvDip (Kinesiology and Coaching Science) - NQF Level 7 (120 credits)

Qualification code: ADKS20

SAQA ID: 111773, CHE NUMBER: H/H16/E178CAN

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
A Diploma in Kinesiology and Coaching Science, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:
See Chapter 30 of Students' Rules and Regulations.

d. Intake for the qualification:
January only.

e. Presentation:
Day classes. Bridging modules are offered in the form of evening classes.

f. Minimum duration:
One or two years (depending on previous qualification).

g. Exclusion and readmission:
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
CSI117V	Contemporary Sport Issues IV (first-semester module)	(7)	(6)
RKS117V	Introduction to Research (second-semester module)	(7)	(12)
SEP107V	Sport and Exercise Psychology IV	(7)	(21)
SPA107V	Sport Performance Analysis IV	(7)	(21)
SXP107V	Sport and Exercise Physiology IV	(7)	(21)

plus one of the following options:

Option 1: Coaching

CHT107V	Coaching Management IV	(7)	(18)
COC107V	Coaching Science IV	(7)	(21)

or

Option 2: Sport

SIJ107V	Sport Injuries IV	(7)	(18)
SSC107V	Sport Science IV	(7)	(21)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

14.8 POSTGRADUATE DIPLOMA IN KINESIOLOGY AND COACHING SCIENCE

PGDip (Kinesiology and Coaching Science) - NQF Level 8 (120 credits)

Qualification code: PDKS23

SAQA ID: 118422, CHE NUMBER: H/H16/E220CAN

Campus where offered: Pretoria Campus

REMARKS

a. *Admission requirement(s):*
An Advanced Diploma in Kinesiology and Coaching Science, **or** a Bachelor's degree in Kinesiology and Coaching Science, **or** a Baccalaureus Technologiae: Sport and Exercise Technology or Officiating and Coaching Science, **or** an equivalent qualification at NQF Level 7 with 120 credits. Preference will be given to applicants with an average of 60% or more in the previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. *Selection criteria:*
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the previous qualification and/or work experience. Candidates who meet the requirements will be shortlisted and invited for an interview with a Departmental Selection Panel.

All applicants received by the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan (SEP), only the top performing applicants will be selected. A waiting list consisting of the remainder of the applicants will provide an opportunity for applicants to fill places created by accepted students failing to meet the enrolment dates. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes offered over a period of one year.

f. *Minimum duration:*
A minimum of one or two years (depending on the programme presentation).

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
AXP108G	Applied Sport and Exercise Psychology	(8)	(36)
RKS108G	Research Methodology	(8)	(24)
	plus one of the following options: Students should have the necessary underbuild on NQF level 7 for the chosen option:		
Option 1: Applied Coaching Science			
CHA118G	Applied Coaching Science A (first-semester module)	(8)	(30)
CHB118G	Applied Coaching Science B (second-semester module)	(8)	(30)
	or		
Option 2: Applied Sport Science			
SRA118G	Applied Sport Science A (first-semester module)	(8)	(30)
SRB118G	Applied Sport Science B (second-semester module)	(8)	(30)
TOTAL CREDITS FOR THE QUALIFICATION:			**120**

14.9 MASTER OF APPLIED SCIENCES

MAppSci - NQF Level 9 (180 credits)

Qualification code: MDAP19

(Specialisation code for admission and registration: MDKS19)

SAQA ID: 102024, CHE NUMBERS: H16/10784/HEQSF, H16/2442/HEQSF, H16/10792/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. *Admission requirement(s):*
A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor's degree, **or** a baccalaureus technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:

- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. *Selection criteria:*
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of one year and a maximum of three years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Applied Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

CODE	MODULE	NQF-L	CREDIT
KOS109M	Dissertation: Kinesiology and Coaching Science	(9)	(180)
KOS109R	Dissertation: Kinesiology and Coaching Science (re-registration)	(9)	(0)
KOS119R	Dissertation: Kinesiology and Coaching Science (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

14.10 MASTER OF HEALTH SCIENCES

MHealthSci - NQF Level 9 (180 credits)

Qualification code: MDHS19

(Specialisation code for admission and registration: MDDT19 / MDOP21 / MDBK21)

SAQA ID: 96890, CHE NUMBER: H16/11150/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. *Admission requirement(s):*
A postgraduate diploma, **or** a bachelor honours degree, **or** a professional bachelor's degree, **or** a baccalaureus technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

Candidates with a National Diploma: Medical Orthotics and Prosthetics at (NQF Level 6) will be required to complete 50% of the credits of a relevant professional bachelor's degree. Detailed information on the process to follow is available at the relevant academic department.

Candidates with a baccalaureus technologiae degree will be required to complete the module Advanced Research Methodology (Proposal) (PRM51BP) at NQF Level 9 and/or one of the following modules:
- Research Methodology (Biometry) (BRM51BP) at NQF Level 8, and/or
- Research Methodology (Theory) (TRM51BP) at NQF Level 8.

Modules are offered as prescribed by the academic department and could be done prior or concurrently with this Master's programme.

b. *Selection criteria:*
Selection based on a personal interview with a departmental selection panel. Details regarding selection interview are obtainable from specific departments. Registration prior to the approval of a research proposal is provisional and will be officially ratified only when the proposal is approved by the Faculty Committee for Postgraduate Studies. These procedures will be fully explained to prospective candidates before registration.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of one year and a maximum of three years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Master of Health Sciences differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: MDBK21			
BIK109M	Dissertation: Biokinetics	(9)	(180)
BIK109R	Dissertation: Biokinetics (re-registration)	(9)	(0)
BIK119R	Dissertation: Biokinetics (re-registration) (semester module)	(9)	(0)
Option 2: MDDT19			
DTE109M	Dissertation: Dental Technology	(9)	(180)
DTE109R	Dissertation: Dental Technology (re-registration)	(9)	(0)
DTE119R	Dissertation: Dental Technology (re-registration) (semester module)	(9)	(0)
Option 3: MDOP21			
OPI109M	Dissertation: Orthotist/Prosthetist Training	(9)	(180)
OPI109R	Dissertation: Orthotist/Prosthetist Training (re-registration)	(9)	(0)
OPI119R	Dissertation: Orthotist/Prosthetist Training (re-registration) (semester module)	(9)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**180**

14.11 DOCTOR OF PHILOSOPHY IN SCIENCE

PhD (Science) - NQF Level 10 (360 credits)

Qualification code: PHDS17

(Specialisation codes for admission and registration: PHBK20 / PHDT17 / PHKS20 / PHOP21)

SAQA ID: 96870, CHE NUMBER: H16/10781/HEQSF

Campus where offered: Pretoria Campus

REMARKS

a. Admission requirement(s):
Any master's degree, **or** any magister technologiae from an accredited South African university in the related or envisaged field of study of the applicant.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations.

b. Selection criteria:
Selection is based on a personal interview with a departmental selection panel. Registration prior to the approval of a research proposal is provisional and will be made official only when the proposal is approved by the Faculty Committee for Postgraduate Studies. The procedure will be fully explained to each prospective student during his or her personal interview.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January and July.

e. *Presentation:*
Research.

f. *Duration:*
A minimum of two years and a maximum of four years.

g. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations.

CURRICULUM

The modules offered within the Doctor of Philosophy in Science differ between departments. Please refer to the contents (page 5) to see which of the other departments within the Faculty offer this programme.

Students register for one of the following specialisation options:

CODE	MODULE	NQF-L	CREDIT
Option 1: PHBK20			
BK1010O	Thesis: Biokinetics	(10)	(360)
BK1010R	Thesis: Biokinetics (re-registration)	(10)	(0)
BK1110R	Thesis: Biokinetics (re-registration) (semester module)	(10)	(0)
Option 2: **PHDT17**			
DT1010O	Thesis: Dental Technology	(10)	(360)
DT1010R	Thesis: Dental Technology (re-registration)	(10)	(0)
DT1110R	Thesis: Dental Technology (re-registration) (semester module)	(10)	(0)
Option 3: PHKS20			
KC1010O	Thesis: Kinesiology and Coaching Science	(10)	(360)
KC1010R	Thesis: Kinesiology and Coaching Science (re-registration)	(10)	(0)
KC1110R	Thesis: Kinesiology and Coaching Science (re-registration) (semester module)	(10)	(0)
Option 4: PHOP21			
OR1010O	Thesis: Orthotist/Prosthetist Training	(10)	(360)
OR1010R	Thesis: Orthotist/Prosthetist Training (re-registration)	(10)	(0)
OR1110R	Thesis: Orthotist/Prosthetist Training (re-registration) (semester module)	(10)	(0)
TOTAL CREDITS FOR THE QUALIFICATION:			**360**

SECTION B: PHASING OUT QUALIFICATIONS

No new registrations for qualifications within this section will be accepted. Students registered for any of these qualifications should complete their studies according to the teach-out date prescribed for the qualification, subject to the stipulations of Regulation 3.1.11 and 3.1.13 in the Students' Rules and Regulations.

Information on phased-out programmes can be obtained from the TUT website, www.tut.ac.za.

1. ADELAIDE TAMBO SCHOOL OF NURSING SCIENCE

1.1 BACCALAUREUS TECHNOLOGIAE: NURSING SCIENCE

Qualification code: BTNS13 - NQF Level 7

Campus where offered:	Pretoria Campus (day classes)
Last year of new intake:	2019
Teach-out (phase-out) date:	31 December 2024
Curriculum:	2019 Prospectus

1.2 BACCALAUREUS TECHNOLOGIAE: NURSING SCIENCE (Extended curriculum programme with foundation provision)

Qualification code: BTNSF1 - NQF Level 7 (4,000 credits)

Campus where offered:	Pretoria Campus (day classes)
Last year of new intake:	2016
Teach-out (phase-out) date:	31 December 2025
Curriculum:	2015 Prospectus

2. DEPARTMENT OF BIOMEDICAL SCIENCES

2.1 NATIONAL DIPLOMA: BIOMEDICAL TECHNOLOGY

Qualification code: NDBM01 - NQF Level 6

Campus where offered:	Arcadia Campus (day classes)
Last year of new intake:	2019
Teach-out (phase-out) date:	31 December 2025
Curriculum:	2019 Prospectus

3. DEPARTMENT OF CHEMISTRY

3.1 NATIONAL DIPLOMA: ANALYTICAL CHEMISTRY (Extended curriculum programme with foundation provision)

Qualification code: NDACF1 - NQF Level 6

Campus where offered:	Arcadia Campus (day classes)
Last year of new intake:	2018
Teach-out (phase-out) date:	31 December 2024
Curriculum:	2018 Prospectus

4. DEPARTMENT OF HORTICULTURE

4.1 NATIONAL DIPLOMA: HORTICULTURE
Qualification code: NDHO04 - NQF Level 6

Campus where offered:	Pretoria Campus (day classes)
Last year of new intake:	2019
Teach-out (phase-out) date:	31 December 2024
Curriculum:	2019 Prospectus

5. DEPARTMENT OF PHYSICS

5.1 NATIONAL DIPLOMA: FIRE TECHNOLOGY
Qualification code: NDFY01 - NQF Level 6

Campus where offered:	Arcadia Campus (day classes)
Last year of new intake:	2018
Teach-out (phase-out) date:	31 December 2024
Curriculum:	2018 Prospectus

6. DEPARTMENT OF SPORT, REHABILITATION AND DENTAL SCIENCES

6.1 BACHELOR OF HEALTH SCIENCES IN BIOKINETICS
BHSci (Biokinetics) - NQF Level 8 (480 credits)
Qualification type: Professional Bachelor's Degree
Qualification code: BPBK20
SAQA ID: 109415, CHE NUMBER: H/H16/E107CAN

Campus where offered:	Pretoria Campus (day classes)
Last year of new intake:	2023
Teach-out (phase-out) date:	31 December 2030
Curriculum:	2023 Prospectus

6.2 DIPLOMA IN DENTAL TECHNOLOGY
Dip (Dental Technology) - NQF Level 6 (360 credits)
Qualification code: DPDT20
SAQA ID: 100989, CHE NUMBER: H16/14275/HEQSF

Campus where offered:	Pretoria Campus (day classes)
Last year of new intake:	2022
Teach-out (phase-out) date:	31 December 2027
Curriculum:	2023 Prospectus

6.3 NATIONAL DIPLOMA: DENTAL TECHNOLOGY
Qualification code: NDDT96 - NQF Level 6

Campus where offered:	Pretoria Campus (day classes)
Last year of new intake:	2019
Teach-out (phase-out) date:	31 December 2024
Curriculum:	2019 Prospectus

SECTION C: MODULE INFORMATION (OVERVIEW OF SYLLABUS)

The syllabus content is subject to change so as to accommodate industry changes. Please note that a more detailed syllabus is available at the Department or in the study guide that is applicable to a particular module. Information relating to the phasing-out programmes in section B is available on the TUT website. At time of publication, the syllabus content was defined as follows:

A

ACADEMIC LITERACY (ALI125X) **CONTINUOUS ASSESSMENT**
(Module custodian: Directorate of Library and Information Services)
Introduction of information literacy. Development of a search strategy and application of a search string to search engines and academic databases. Evaluation of information sources. Ethical and legal use of information. (Total notional time: 20 hours)

ACCELERATORS AND NUCLEAR REACTORS I (ANB117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Accelerator ion sources; accelerator technologies; applications of accelerators; nuclear reactor physics; nuclear power reactors; applications of research reactors. (Total notional time: 120 hours)

ACCELERATORS AND NUCLEAR REACTORS II (ANB108G) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Accelerator physics; Ion beams in materials science and technology; Nuclear reactor theory and technology; Nuclear waste management; and Socio-economic impact of nuclear technology. (Total notional time: 180 hours)

ADAPTIVE PHYSICAL ACTIVITY I (APV315D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
A module that equips students with knowledge, skills and values to safely promote health, physical activity, participation and sport performance for people with disability. The purpose of this module is to offer students the needed theoretical knowledge, practical experience and relevant designation to render services in adapted physical activity. (Total notional time: 60 hours)

ADMINISTRATION AND LEGISLATION I (ALN105D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Nature Conservation)
Introduction to the most important basic components of administration – personnel, financial and general principles as well as all legislation applicable to the field of nature conservation. Students who complete the module successfully, will be able to demonstrate knowledge, skills and applied competencies in areas such as, but not limited to Conservation Legislation, Law Enforcement, and Conservation Regulations. (Total notional time: 120 hours)

ADVANCED ANIMAL BREEDING AND GENETICS (AAB107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Animal Sciences)
Integrated knowledge of Mendelian Genetics, Population Genetics, Quantitative Genetics, and Molecular Genetics as well as an ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories thereof as applied to the related fields of study. (Total notional time: 240 hours)

ADVANCED ANIMAL HEALTH (AAH107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Animal Sciences)
Integrated knowledge animal health and legal framework, effects of climate change on heat stress and animal health, causes, symptoms, treatment and prevention of animal diseases for different species as well as an ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories as applied to the related fields of study. (Total notional time: 240 hours)

ADVANCED ANIMAL NUTRITION (AAU107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Animal Sciences)
Integrated knowledge of animal feeding and nutrition, ruminal and hindgut fermentation, nutrients and their metabolism, feedstuffs, nutritional requirements and ration formulation for different species as well as ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories thereof as applied to the related fields of study. (Total notional time: 240 hours)

ADVANCED ANIMAL REPRODUCTIVE PHYSIOLOGY (AAR107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Animal Sciences)
Integrated knowledge of male and female reproductive organs, advanced anatomy, function and regulation of male and female hormones, semen collection techniques, assisted reproductive technologies, oestrus synchronisation and embryo transfer technologies as well as an ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories thereof as applied to the related fields of study. (Total notional time: 240 hours)

ADVANCED EQUINE HEALTH CARE (AEH107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Animal Sciences)
Integrated knowledge of inflammation (pathophysiology and recent developments in therapy), infectious diseases and drug resistances, gastrointestinal problems, respiratory conditions, dehydration and shock in sport horses, fertility problems, developmental and degenerative joint diseases in sports horses, discipline-related sports injuries, programs in preventative medicine, drugs and medication as well as an ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories of as applied to the related fields of study. (Total notional time: 240 hours)

ADVANCED EQUINE REPRODUCTIVE AND EXERCISE PHYSIOLOGY (AER107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Animal Sciences)
Integrated knowledge of mare and stallion reproductive organs, assisted reproductive technologies, gait analysis and equine locomotion patterns, functional and applied equine biomechanics, perceptual motor learning and motor control, equestrian training principles and concepts as well as an ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories thereof as applied to the related fields of study. (Total notional time: 240 hours)

ADVANCED FOOD TECHNOLOGIES (AFT107V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biotechnology and Food Technology)
Introduction to food processing and preservation; extrusion technology; membrane filtration techniques; irradiation; modified atmosphere packaging; active and intelligent packaging; oxygen, ethylene and other scavengers; edible films; emerging novel processes; applied methods, techniques and data handling. (Total notional time: 240 hours)

ADVANCED HORTICULTURAL TECHNOLOGY (HTE108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Horticulture)
This module will prepare students to identify/define a problem/situation/scenario on a topic in a horticulture or related field through critical thinking; plan a sound project to solve the problem/situation/scenario after an intensive literature study on the topic. The qualified student will be able to apply advanced knowledge regarding the critical factors needed to solve the problem/scenario/situation in horticulture or related industries, by developing solutions/control/recommendations with topics and challenges including advanced and applied genetics and breeding, environmental, climate change and plant stress, specialised plant production systems including bulb forcing, seed dormancy, year round production, post-harvest technology as well as relevant plant legislations and plant regulation acts concerning plant improvement, health, conservation, protection, import and export of plant material according to national and internationally accepted standards. (Total notional time: 480 hours)

ADVANCED MOLECULAR BIOLOGY (MLB107V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biotechnology and Food Technology)
This module prepares the student to understand the power and application of the different omics with regards to genetic data analysis, plasmid selection and design, cloning and the ethical issues relating to genetic modification. This module will contribute to the preparation of technologists that are interested in postgraduate studies in the field of Recombinant DNA Technology and require a sound understanding of the basic principles of Microbiology I, Microbiology II and Molecular Biology. The content will include (but not limited to): Sequencing, genome sequencing, bioinformatics, functional genomics, proteomics, systems biology, comparative genomics and metagenomics. The characteristics, types of plasmids and their application. The theory and practical execution of PCR. Theory and practical execution of cloning DNA into host cells and Benefits of genetic engineering and the comparison thereof to the ethical arguments against it. (Total notional time: 480 hours)

ADVANCED PHILOSOPHIES AND THEORIES OF QUALITY (PTQ118G) **1 X 3-HOUR PAPER**
(Module custodian: Department of Mathematics and Statistics)
Introduction to TQM; Leadership for quality; Quality Management for Excellence 1; Performance excellence and organisational behaviour; Deming, Juran, Crosby, Feigenbaum, Ishikawa; New quality Guru's; Partnering and Strategic alliances for quality; Customer retention, customer satisfaction and customer loyalty; Self-assessment tools and models, Quality Awards; Innovation in International Standards; Design for quality, Organising for quality; Organisational Learning and Transformational change; and Best practice and World Class organisations. (Total notional time: 160 hours)

ADVANCED PHYSICS I (APA107V) **2 X 3-HOUR PAPERS**
(Module custodian: Department of Physics)
Part A (paper I): Solid State and Quantum Mechanics - Crystallography; Electron theory of solids; Semiconductor device theory; Wave-particle duality; Schrodinger wave equation: wave function, interpretation, standard solutions, tunneling and first order time independent perturbation theory. Part B (paper II): Thermodynamics and Statistical Mechanics - Ideal and real gases; First, Second and Third laws of thermodynamics; Thermodynamic potentials: Legendre transformations, Maxwell relations; Classical statistical thermodynamics: ensembles, Maxwell-Boltzmann statistics; Quantum statistical physics: Bose-Einstein and Fermi-Dirac statistics. (Total notional time: 240 hours)

ADVANCED RESEARCH METHODOLOGY AND PROJECT (RIP448P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
The theory and practice of research including, a structured project in an area of pharmacy. The module is presented in three parts: Part 1: Research methodology theory and protocol development. Part 2: Experimental phase and data collection. Part 3: Completion and submission of research report. These parts are separated by other modules for administration and logistic purposes. (Total notional time: 300 hours)

ADVANCED WASTEWATER TREATMENT III (WWT117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Environmental, Water and Earth Sciences)
Management strategies for pollution prevention and waste minimisation; Wastewater treatment processes applicable to industrial effluents including: flow equalisation, neutralisation, oil removal, metal removal, biological treatment processes; Application of wastewater treatment technologies to industrial effluents; and Sludge handling. (Total notional time: 150 hours)

ADVANCED WATER ANALYSES IV (WAN108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Environmental, Water and Earth Sciences)
Application of the following methods on potable water and wastewater, industrial effluents and mine water samples: Chromatography, Adsorption studies, Filtration process, Organic compounds determination, Biological nutrient removal and Molecular Techniques. (Total notional time: 150 hours)

ADVANCED WATER TREATMENT III (WTR117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Environmental, Water and Earth Sciences)
Understanding of different treatment methods used to treat water and wastewater, which include flocculation, flotation, sedimentation, adsorption, ion exchange, reverse osmosis, gas transfer, advanced disinfection techniques membrane technology and chemical precipitation. (Total notional time: 150 hours)

AGRIBUSINESS (AGB107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Crop Sciences)
The decision-making process; Record keeping for farm management information; Financial statements, budgets and their analysis; Capital investment and time value of money; Approaches to study marketing; Marketing costs, margins, agricultural and food business strategies; Marketing alternatives and commodity futures market; Marketing board and policy in South Africa. (Total notional time: 240 hours)

AGRICULTURAL ECONOMICS I (AGE115D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Crop Sciences)
Description of the South African agricultural environment. Role-players in the South African agricultural industry. (Total notional time: 120 hours)

AGRICULTURAL MECHANISATION I (AGM115D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Crop Sciences)
Principles and operation of the basic power units applicable to agriculture. (Total notional time: 120 hours)

AGRONOMY (AGR107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Crop Sciences)
Production plans; Crop physiology; Crop growth and phenological development; Crop husbandry; Fertilisation and irrigation scheduling; Crop grading; Crop insurance. (Total notional time: 240 hours)

AIR QUALITY MANAGEMENT IV (AQM408P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Environmental Health)
Air pollution sources and related emissions of the respective priority industrial processes; respective available options to control air pollution; air pollution measurement equipment/ techniques and apply the respective sampling techniques; global warming consequences, strategies and mitigation measures; measurement, interpretation and prescribing of controls and reporting on environmental noise impacts; environmental radiation sources and health effects of radiation and radioactivity. (Total notional time: 150 hours)

ANALYTICAL CHEMISTRY I (AYC105D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemistry)
Chemicals, Apparatus and Unit Conversions. Calculations used in Analytical Chemistry. Titrimetric methods. Gravimetric methods. Aqueous solutions and Chemical Equilibria. Statistical methods. (Total notional time: 240 hours)

ANALYTICAL CHEMISTRY PRACTICE (ACY107V) **PROJECT ASSESSMENT**
(Module custodian: Department of Chemistry)
Mini Project: Apply theoretical knowledge of chromatography, molecular spectroscopy, atomic spectrometry, electro-analytical techniques, synthetic chemistry, thermal analytical and kinetic methods to perform quantitative and qualitative analysis of real samples. Data analysis, data interpretation and report writing. (Total notional time: 300 hours)

ANALYTICAL TECHNIQUES FOR NANOTECHNOLOGY (ATN118G) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Scanning electron microscopy; Secondary ion mass spectrometry; X-ray diffraction; UV-Vis spectrophotometry; and FTIR spectrometry. (Total notional time: 120 hours)

ANATOMY AND PHYSIOLOGY I (AAP105P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
Overview of anatomy and physiology; organisation of human body; cytology; histology; systems of the body; biochemistry. (Total notional time: 170 hours)

ANATOMY AND PHYSIOLOGY I (APS105D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate informed understanding of the core areas of human anatomy and physiology. To understand key anatomical structures, locations, physiology terms, concepts, medical related facts, and the general principles of the organisation of the human body. (Total notional time: 120 hours)

ANATOMY AND PHYSIOLOGY II (APS206D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate detailed knowledge of the human body's cellular and chemical organisation, the principles of support and movement, the control and maintenance of the human body through the various organ systems, and pathophysiology of the organ systems. (Total notional time: 120 hours)

ANATOMY AND PHYSIOLOGY III IN: CARDIOLOGY (CYA307P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to integrate knowledge of Anatomy and Physiology in Cardiology and covers; embryology of the cardiovascular system, anatomy of the cardiovascular system, and physiology of the cardiovascular system. (Total notional time: 180 hours)

ANATOMY AND PHYSIOLOGY III IN: CARDIOVASCULAR PERFUSION (VAA307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Anatomy and Physiology in Cardiovascular Perfusion and covers; embryology of the cardiovascular system, anatomy of the cardiovascular system, and physiology of the cardiovascular system. (Total notional time: 180 hours)

ANATOMY AND PHYSIOLOGY III IN: CRITICAL CARE (CCA307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Anatomy and Physiology in Critical Care and covers the following systems; respiratory, cardiovascular, nervous, renal, and gastrointestinal. (Total notional time: 180 hours)

ANATOMY AND PHYSIOLOGY III IN: NEPHROLOGY (NEA307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Anatomy and Physiology in Nephrology and covers; embryology of the renal system, anatomy of the renal system, and physiology of the renal system. (Total notional time: 180 hours)

ANATOMY AND PHYSIOLOGY III IN: NEUROPHYSIOLOGY (NRA307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Anatomy and Physiology in Neurophysiology and covers; embryology of the nervous system, anatomy of the nervous system, and physiology of the nervous system. (Total notional time: 180 hours)

ANATOMY AND PHYSIOLOGY III IN: PULMONOLOGY (PLA307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Anatomy and Physiology in Pulmonology and covers; embryology of the respiratory system, anatomy of the respiratory system, and physiology of the respiratory system. (Total notional time: 180 hours)

ANATOMY AND PHYSIOLOGY III IN: REPRODUCTIVE BIOLOGY (RDA307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Anatomy and Physiology in Reproductive Biology and covers; embryology of the reproductive system, anatomy of the reproductive system, physiology of the reproductive system, reproductive endocrinology, and reproductive genetics. (Total notional time: 180 hours)

ANIMAL ANATOMY I (ANM115P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire an informed understanding of the basic principles of structure and form of animals to include definitions, characteristics of the different types of cells, tissues, organ systems, organisms, the systems' apparatus and the comparative morphology of animals of different classes. (Total notional time: 120 hours)

ANIMAL ANATOMY AND PHYSIOLOGY I (AAA105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

An informed understanding of the principles of animal anatomy and physiology is important. Students will acquire knowledge, skills and applied competencies in areas such as: general anatomy and physiology of animals; animal cells, tissues and organs; musculoskeletal systems; animal body regulatory systems; haematology and body defense mechanisms; thoracic internal organs including cardiovascular and pulmonary systems; digestive system and accessory glands; male and female urogenital systems and mammary gland; applicable Acts and regulations; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 240 hours)

ANIMAL BREEDING AND GENETICS I (ABG115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

An informed understanding of the principles of animal breeding and genetics is important for livestock improvement. Students will acquire knowledge, skills and applied competencies in areas such as: basic concepts of animal breeding and genetics, qualitative and quantitative traits of inheritance, population genetics and evolution, selection methods, breeding programmes and mating systems, molecular genetics, Animal Improvement Schemes; applicable Acts and regulations; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 120 hours)

ANIMAL NUTRITION I (ANT115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

An informed understanding of nutrition and nutrients requirements of farm animals is important. Students will acquire knowledge, skills and applied competencies in the following areas: the components of feed, function of the digestive system, animal nutritional requirements, raw materials as feedstuffs, use of nutrients by farm animals, use of feed additives in animal feeding, feedstuff analysis and ration formulation, and processing of animal feeds; applicable Acts and regulations; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 120 hours)

ANIMAL PHYSIOLOGY I (ANP115P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire an informed understanding of the basic principles of concepts and theories including functions of the body and its constituent parts, the biophysical and biochemical processes of cells, muscles, organs and organ systems. (Total notional time: 120 hours)

ANIMAL SCIENCE RESEARCH (ASR108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Animal Sciences)

Key concepts and principles of Animal Science Research. Ethical considerations related to animal science research. Research project proposal writing. Review of relevant literature. Research Methodology: Data collection methods and techniques. Scientific Research Project Execution. Data Analysis Methods and Techniques. Scientific writing and preparation of scientific manuscripts. Submit a Research Report. Presentation of seminars. (Total notional time: 300 hours)

ANIMAL STUDIES I (ANS105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Introduction to taxonomic and morphological characteristics, life cycles, adaptations, and ecological importance of invertebrate and vertebrate animals. Concepts in animal diseases, the vectors driving infection, treatment and control of exotic and indigenous diseases. (Total notional time: 240 hours)

ANIMAL STUDIES II (ANS206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Introduction to the most important terms and concepts of Zoogeography and Animal Ethology. In addition, the student will be introduced to the principles of Animal Behavioural Ecology and Human-Wildlife interactions. (Total notional time: 240 hours)

ANIMAL STUDIES III (ANS107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This fundamental module is aligned with an integrated and detailed body of knowledge, in articulation with the specific field of Nature Conservation and serves to resolve problems and introduce change within the practice of Vertebrate Population Dynamics and Ethology. It further covers aspects on Ethology: Higher order vertebrate behaviour, Mammal behaviour and Human-wildlife interactions. (Total notional time: 240 hours)

ANIMAL STUDIES IV (ANS108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

The module deals with red listed and threatened species as well as intervention strategies in comprehensive detail. The focus is on research into all aspects of vertebrate and invertebrate zoological diversity, red listed and threatened animal species, meta population management plans, spatial ecology and biotelemetry and wildlife monitoring. (Total notional time: 240 hours)

APPLIED ANIMAL BREEDING AND GENETICS (AAG108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Animal Sciences)
Key concepts and principles of Applied Animal Breeding and Genetics. Animal recording systems and international guidelines for genetic evaluation. Quantitative traits and selection methods in livestock improvement. Evaluation of animal breeding programmes and mating systems. Determination of genetic relationships and covariance between relatives. Development of statistical models for estimation of animal breeding values. Estimation of genetic parameters and application of animal breeding values. Application of modern molecular genetic technologies in livestock improvement. (Total notional time: 300 hours)

APPLIED ANIMAL NUTRITION (AAN108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Animal Sciences)
Key concepts and principles of Applied Animal Nutrition. Identification of feedstuffs and determination of feedstuff quality. Nutritional analysis of feed ingredients. Applied ruminant nutrition at different physiological stages and for different production purposes. Applied non-ruminant nutrition at different physiological stages and for different production purposes. Ration formulation and evaluation for animals at different stages of production. Applied animal nutrition practices and interactions with the environment. Animal feed industry structure and regulatory standards. (Total notional time: 300 hours)

APPLIED ANIMAL REPRODUCTIVE PHYSIOLOGY (AAR108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Animal Sciences)
Key concepts and principles of Applied Animal Reproductive Physiology. Gametogenesis in farm animals. Applied endocrinology in farm animals. Growth and development physiology in farm animals. Embryology in farms animals. Reproductive failure in farm animals. Modern assisted reproductive technologies in farms animals. Regulations and ethical issues of assisted reproductive technologies in farm animals. (Total notional time: 300 hours)

APPLIED COACHING SCIENCE A (CHA118G) **CONTINUOUS ASSESSMENT**
APPLIED COACHING SCIENCE A (CHB118G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
The module aims to develop students' understanding of examining physical, technical, and tactical skills. It also offers practical knowledge in designing training sessions and enabling analysis of skills in order to improve the athletes' performance. This module will be focused on teaching students to prepare a safe coaching environment appropriate to the players involved and to be able to plan a training session and to understand the theoretical concepts that may help coaches to design innovative practice environment in order to facilitate skill learning among athletes. (Total notional time: 300 hours)

APPLIED DENTAL TECHNOLOGY I (APD105D) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
The manufacturing of all types of full dentures. The use and handling of materials and equipment that is important in prosthetic work. (Total notional time: 300 hours)

APPLIED DENTAL TECHNOLOGY II (APD206D) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
The design and manufacture of all types of dentures, orthodontic appliances and mouth guards. These include clinical work received from the clinics. Full metal crowns, temporary crowns and posts are also constructed. (Total notional time: 330 hours)

APPLIED DENTAL TECHNOLOGY III (APD306D) **PRACTICAL EXAMINATION**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
The construction of full metal crowns and bridges with acrylic veneers, as well as metal constructions for porcelain crowns, prosthetics, orthodontics and cobalt chrome. (Total notional time: 360 hours)

APPLIED ENVIRONMENTAL PRACTICE I (AEP115D) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Environmental, Water and Earth Sciences)
Essay writing. Site visit. Mapping and geographical positioning system. (Total notional time: 60 hours)

APPLIED ENVIRONMENTAL PRACTICE II (AEP206D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Scientific report writing. Learn to select appropriate tools and techniques in creating or editing graphics within a guided environment. Demonstrate detailed knowledge of and the ability to use the key terms, concepts, facts, principles, theories of how remote sensing works. Distinguish between possible areas of specialisation within the field of remote sensing and understand how remote sensing can be used in environmental monitoring and geographical information systems (GIS). Detailed knowledge and the ability to apply key terms, concepts, facts, principles, rules and theories in the field of geographical information systems and an understanding of how it is related to other closely related fields like geology, town planning, botany, hydrology and climatology. Evaluate a geospatial problem, select and apply appropriate geographic information system (GIS) methods, procedures and techniques to identify and apply geospatial analysis. Demonstrate the ability to identify, analyse and solve problems in unfamiliar contexts like a site visit to a greenfields or brownfields site where a development is proposed to occur, gathering relevant evidence of the current biotic and abiotic environmental conditions and applying baseline assessment procedures to make informed recommendations on how the development should be managed. (Total notional time: 200 hours)

APPLIED ENVIRONMENTAL PRACTICE III (AEP316D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Air dispersion modelling. Demonstrate detailed knowledge of Geographic Information Systems (GIS) and the ability to apply its key terms, concepts, facts, principles, rules and theories. Use Geographic Information Systems (GIS) for the investigation of environmental problems with a view to finding appropriate solutions to those problems. Identify, analyse and solve problems with new unfamiliar developments or projects, gathering evidence and applying solutions based on evidence and procedures appropriate to the field of Environmental Impact Assessment (EIA) or Strategic Environmental Assessment (SEA) in environmental science. Demonstrate the ability to evaluate different sources of information, to select information appropriate to the task of Strategic Environmental Assessment (SEA) or Environmental Impact Assessment (EIA) and to apply well-developed analysis, synthesis and evaluation of that information. (Total notional time: 250 hours)

APPLIED FOOD TECHNOLOGIES (AFE108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biotechnology and Food Technology)

The module prepares the student to function effectively in a scientific environment and apply the key terms, and techniques in the field of Food Technology. The student will be allowed to source relevant information, summarise, interpret and communicate in a scientific way, scientific principles on various Applied Food Technology topics, including but not limited to: Advanced Preservation Technologies and Application; Thermal and Non-Thermal Preservation Technologies; Chemical Preservation Technologies; Biological Preservation Technologies; Nanotechnology; Indigenous Food Systems and Technological Potential; and Food Toxicology and Detoxification Technologies. (Total notional time: 360 hours)

APPLIED EXERCISE PHYSIOLOGY I (AEX307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module is aimed at applying knowledge to demonstrate an understanding of the acute and chronic physiological responses to exercise, and the physiological basis of exercise performance. The module examines: the metabolic supply of energy to exercising muscle; the acute responses of the cardiovascular, respiratory, thermoregulatory, neural, endocrine and muscular systems to exercise; the chronic physiological responses to exercise training; and focuses on exercise-related age, sex consideration, cardiovascular and metabolic diseases. (Total notional time: 240 hours)

APPLIED MOLECULAR BIOLOGY (AMI108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biotechnology and Food Technology)

This module provides the students with the concepts and principles of DNA typing and profiling in forensic, animal and plant genetics. Upon completion, the student will be able to appreciate importance and apply the knowledge of Molecular Biology and to understand the applications thereof. (Total notional time: 360 hours)

APPLIED PHARMACOLOGY IN NURSING II (APN216P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to demonstrate an integrated knowledge of the pharmacological principles of drugs such as antimicrobials, antiretrovirals and vitamins and minerals. Upon completion of the module, the student will be able to apply and demonstrate the relevant competencies, including the application of the principles of pharmacokinetics and pharmacodynamics, adverse effects of drugs and drug calculations. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time and 37.5 hours of self-directed learning (including assessment time))

APPLIED SPORT AND EXERCISE PSYCHOLOGY (AXP108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module equips students with a grounding in psychological assessment techniques as a means of evaluating and understanding sport participants and teams in contemporary sport psychology service delivery. The student will be able to apply/import knowledge of anecdotal reports, theoretical frameworks and scientific findings concomitant with efficacious sport psychology service delivery. (Total notional time: 360 hours)

APPLIED SPORT SCIENCE A (SRA118G) **CONTINUOUS ASSESSMENT**
APPLIED SPORT SCIENCE B (SRB118G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
The purpose of this module is to equip students with knowledge, skills and values to safely promote physical activity, collect, analyse, organise and critically evaluate information related to the components of Fitness and skill related components of Fitness. Student will make use of any sport code to complete the abovementioned activities. In addition, this module offers learners the needed practical experience in evaluating and analysing of information obtained from sporting athletes and provide feedback by implementing an intervention plan if needed in the applied world of Sport Science in all applicable areas. (Total notional time: 300 hours)

APPLIED STATISTICS (APL107V) **PRACTICAL EXAMINATION**
(Module custodian: Department of Mathematics and Statistics)
Statistical concepts, data types, sampling, Summaries data using tables and graphs, Measures of location and dispersion, Probability and probability distributions, Inferential statistics on a single mean, proportion or variance, Simple regression and correlation. Reporting on statistical findings. Inferential statistics on multiple means, proportions or variances, Chi-square tests, Basic statistical process control, and theory of six sigma. (Total notional time: 240 hours)

AQUATIC SCIENCE I (AQS107V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Nature Conservation)
This elective learning module gives an overview of freshwater management and further covers various aspects of Water flow through the landscape: lotic, lentic and wetlands, ecological reserves, the freshwater crisis and associated policy and legislation. The module enables the student to resolve problems and issues surrounding freshwater management within the context of biodiversity conservation. South Africa is currently facing moderate to severe water stress and the number of people suffering is expected to increase as a result of climate change hence this module covers topical issues relevant to the country. Integrated theoretical knowledge and requisites essential for the monitoring and management of aquatic parameters in a protected area will be demonstrated by the graduate. (Total notional time: 180 hours)

ATOMIC SPECTROSCOPY (ASP117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemistry)
Overview of syllabus: Electrothermal atomic absorption and High-resolution continuum atomic absorption spectrometry: Atomisation, advanced sample introduction techniques, interferences and application of ETAAS and HRCAAS. Inductively Coupled Plasma Atomic Emission Spectrometry: Ionization, advanced sample introduction techniques, interferences and application of ICP-AES. Atomic X-ray Fluorescence Spectrometry: X-ray sources, absorption of X-rays, emission of fluorescence radiation, WDXRF and EDXRF instruments, sample preparation, matrix effects and application of XRF. (Total notional time: 120 hours)

ATOMIC SPECTROSCOPY III (ASP316D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemistry)
Introduction to Atomic Spectroscopy. Standardisation and Calibration. Signals and Noise. Atomic Absorption Spectrometry. Atomic Emission Spectrometry. Atomic X-ray Spectrometry. (Total notional time: 180 hours)

B

BASIC APPLIED EPIDEMIOLOGY AND BIOSTATISTICS (BEB108G) CONTINUOUS ASSESSMENT
(Module custodian: Department of Pharmaceutical Sciences)
This module includes an understanding of, and an ability to apply and evaluate, the key terms, concepts, facts, principles, rules, theories, legislation and guidelines both nationally and internationally within the context of the development processes and post marketing surveillance of small molecule medicines, biological and biotechnological products in advanced drug delivery systems, complementary medicines and devices; research methods and biostatistics, health systems management, health economics, the key terms, concepts, facts, principles, rules and theories, research methodologies, methods and techniques relevant to the field of epidemiology and biostatistics and clinical research; interrogate multiple sources of knowledge in the medicines development and control process; appropriate standard procedures, processes or techniques in clinical research and epidemiology and biostatistics; ethical issues, ethical and professional values and approaches within the clinical research and epidemiology and biostatistics field; the information gathering process, the synthesis of data, evaluation and management of data in the specialised contexts of clinical research and epidemiology and biostatistics. (Total notional time: 120 hours)

BASIC PRINCIPLES OF ENGINEERING (CAD) (BPC105P) CONTINUOUS ASSESSMENT
(Module custodian: Department of Mechanical and Mechatronics Engineering)
This module provides a basic introductory knowledge, cognitive and conceptual tools and practical skills in the field of graphical design. Upon completion, the student will have basic introductory knowledge and skills in graphical communication to enable them to convey design information, of a part and assembly such as dimensions, tolerances and, materials according to application-specific conventions to the point where the part can be manufactured. This module is therefore focused on in providing fundamental understanding essential for graphical design. Knowledge and skills acquired in this module enhances the ability of students in the modules Orthotics and Prosthetics Practice. (Total notional time: 140 hours)

BASIC PRINCIPLES OF ENGINEERING (MANUFACTURING) (BPE115P) CONTINUOUS ASSESSMENT
(Module custodian: Department of Mechanical and Mechatronics Engineering)
The purpose of this module is to equip the student with a fundamental understanding of mechanical manufacturing materials and processes and how to apply these to a design problem. It gives an overview of materials used and each process in detail and how it interrelates with the other phases of manufacturing processes. Each phase of a manufacturing process will be discussed in detail including what types of knowledge and skills are required to successfully complete each phase. The module will also enable students to analyse processes. The module will consist of practical assignments and an assignment which will enhance the practical application of the knowledge of materials and processes. (Total notional time: 140 hours)

BEEF PRODUCTION II (BPA206D) 1 X 3-HOUR PAPER
(Module custodian: Department of Animal Sciences)
Students will acquire detailed knowledge, skills and applied competencies in areas such as: Beef cattle Industry and Beef Cattle Improvement Schemes; Evaluation of beef cattle breeds; Beef cattle breeding plans, genetic evaluation and visual appraisal; Reproductive system; Production management of beef cattle; Nutritional practices in beef cattle; Cattle handling equipment; Beef cattle diseases and disease control; Red meat classification system and red meat market; applicable Acts and regulations; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 240 hours)

BIOANALYTICAL CHEMISTRY II (BAC216D) 1 X 3-HOUR PAPER
(Module custodian: Department of Chemistry)
Introduction to Bioanalytical Chemistry. The role and importance of analytical chemistry in everyday life. Perform analytical chemistry calculations. Calculate the amount required to prepare accurate concentrations of solutions. Apply titration method to quantify the content of acid or a base. Apply appropriate procedure to determine unknown analyte quantity in a given sample. Identify and explain the functions of the components of spectrophotometer and chromatographic instrument. Apply the fundamental laws of photometry to solve spectroscopic problems. Separate and identify analytes by applying appropriate chromatographic principles. Compile and present report. (Total notional time: 120 hours)

BIOANALYTICAL CHEMISTRY III (BAC316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Calculations in Analytical Chemistry. Introduction to Spectrochemical methods. Atomic Absorption Spectrometry. Molecular Spectrometry. Sample preparation. General principles of Gas Chromatography, general principles of Liquid Chromatography. (Total notional time: 120 hours)

BIOCHEMISTRY II (BCH216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

The Organisation of a cell. Molecular structure of amino acids and proteins. Enzyme Kinetics. Carbohydrates. Lipids. Nucleic acids. Reagents, pH and buffers. (Total notional time: 120 hours)

BIOCHEMISTRY II (BCH216P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire detailed knowledge and understanding of the fundamental and specialised aspects of Biochemistry and Biological Chemistry in the field of Veterinary Technology. The student will gain knowledge of structural biochemistry, reagent preparation, cellular processes, laboratory automation and analytical techniques to offer solutions to simple and complex problems and answer routine diagnostic questions related to the field of Veterinary Technology. (Total notional time: 120 hours)

BIOETHICS (BIE118G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biotechnology and Food Technology)

This module prepares the student to undertake advanced reflection and critical thinking by applying and practicing ethical issues relevant to this field. The student should understand the ethical issues and define, discuss and critically analyse ethical issues in different areas of Biotechnology such as research, medical, agriculture, genetics, animal and pharmaceutical industry. (Total notional time: 180 hours)

BIOINFORMATICS (BII118G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biotechnology and Food Technology)

This module guides the student in the understanding and usage of computer programmes to address problems specific to the field of Biotechnology, essentially a computational area of molecular biology. The student will be trained to apply the skills to routine tasks regarding molecular biology. (Total notional time: 180 hours)

BIOKINETICS PRACTICE I (WIL) (BKP105P) **WORK-INTEGRATED LEARNING**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student with professional ethical conduct, intellectual competencies and practical skills in the field of Biokinetics. They should be able to apply their theoretical knowledge in the practical aspects of Biokinetics and acquire the appropriate skills to practice in various settings. Students will be based in the Biokinetics lab, conducting practical physical assessment and health assessment; prescription and monitoring of individual; and group exercise programs (including therapeutic recreation) in apparently healthy or low-risk individuals under supervision. (Total notional time: 100 hours)

BIOKINETICS PRACTICE II (WIL) (BKP206P) **WORK-INTEGRATED LEARNING**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student with professional ethics conduct, intellectual competencies and practical skills in the field of Biokinetics. The student will be based in the Biokinetics lab conducting 1) Exercise Preparticipation health screening and physical activity readiness, test readiness among apparently healthy and low-risk individuals; and 2) Physical fitness and health assessments, interpret, prescription and monitoring of individual and group exercises (including therapeutic recreation) in apparently healthy and low-risk individuals under supervision. (Total notional time: 100 hours)

BIOKINETICS PRACTICE III (WIL) (BKP307P) **WORK-INTEGRATED LEARNING**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student to understand the practical application of exercise in preventing or delaying the onset of chronic diseases. It also focuses on practical methods of exercise management of healthy persons as well as individuals with pathologies, the use (application) of fundamental principles of exercise physiology in clinical settings to minimise the risk of chronic diseases associated with physical inactivity and to manage those already affected. The student will be exposed to the practical application of Biokinetics practices in community, corporate, commercial, institutional fitness, wellness centres, nursing homes, centres for senior citizens and hospitals. (Total notional time: 100 hours)

BIOKINETICS PRACTICE IV (WIL) (BPK408P) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student to understand the practical application of exercise in preventing or delaying the onset of chronic diseases. It also focuses on practical methods of exercise management of healthy persons as well as individuals with pathologies, the use (application) of fundamental principles of exercise physiology in clinical settings to minimise the risk of chronic diseases associated with physical inactivity and to manage those already affected. The student will be exposed to the practical application of Biokinetics practices in community, corporate, commercial, institutional fitness, wellness centres, nursing homes, centres for senior citizens and hospitals. (Total notional time: 450 hours)

BIOMECHANICS (BMI205P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student within the field of Biomechanics related to orthotics and prosthetics. On completion, the student will be able to apply knowledge about biomechanics towards the management of patients in the field of orthotics and prosthetics. (Total notional time: 180 hours)

BIOMECHANICS I (BMH205D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
The purpose of this module is to prepare the student within the field of Biomechanics related to physical activity and exercise. The student will be able to apply knowledge about anatomy and biomechanics to the evaluation of the strengths and weaknesses of the performance of sport and exercises techniques. In addition, the student will be well positioned to extend his/her learning and practice to other areas where sport science is applied to the improvement of the mechanics of performance and to modify physical activity according to the aims and needs of the participants. Students will also be able to analyse the mechanical effectiveness and efficiency of sport and exercise performance in order to promote specific performance improvements as well as an increase in the physical safety of performance in general. (Total notional time: 180 hours)

BIOMECHANICS I (BMH205P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student within the field of Biomechanics related to physical activity and exercise. On completion, a student will be able to apply knowledge about anatomy and biomechanics to the evaluation of the strengths and weaknesses of the performance of sport and exercises techniques. (Total notional time: 180 hours)

BIOMEDICAL APPARATUS II (BAP206P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student with detailed knowledge of Biomedical Apparatus and covers the following apparatus; infusion devices, pressure transducers, electrode's, sterilisation, phlebotomy, patient transport, basic category apparatus. (Total notional time: 180 hours)

BIOMEDICAL APPARATUS III IN: CARDIOLOGY (CYB307P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to integrate knowledge of Biomedical Apparatus in Cardiology and covers; electrocardiography, pacemakers, echocardiography, cardiac catheterisation, intra-aortic balloon pump, and cardiac defibrillators. (Total notional time: 240 hours)

BIOMEDICAL APPARATUS IV IN: CARDIOLOGY (CYB408P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate integrated knowledge and engagement in the Cardiology speciality at the forefront of Clinical Technology and covers; advanced cardiac arrhythmia, cardiac electrophysiology studies, high-powered pacing devices, cardiac resynchronisation therapy, advanced echocardiography modalities and applications, and haemodynamic monitoring and assessment in left and right heart cardiac catheterisation diagnostic and intervention studies. (Total notional time: 120 hours)

BIOMEDICAL APPARATUS III IN: CARDIOVASCULAR PERFUSION (VAB307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Biomedical Apparatus in Cardiovascular Perfusion and covers; blood pumps, warming and cooling devices, thermometers and flow meters, venous drainage and assist devices, blood and gas filters, cardiotomy reservoirs, haemodynamic monitoring equipment, circulatory and pulmonary support devices, intra-aortic balloon pump, ablation and maze procedures. (Total notional time: 240 hours)

BIOMEDICAL APPARATUS IV IN: CARDIOVASCULAR PERFUSION (VAB408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate integrated knowledge and engagement in the Cardiovascular Perfusion area at the forefront of Clinical Technology and covers; haemodilution and flow mechanics of extra-corporeal devices, troubleshooting during cardiopulmonary bypass, organ transplantation and selected organ/limb perfusion, and advanced Perfusion Techniques. (Total notional time: 120 hours)

BIOMEDICAL APPARATUS III IN: CRITICAL CARE (CCB307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Biomedical Apparatus in Critical Care and covers the following areas; patient monitoring, blood gas analysis, hospital emergency procedures, ventilation acute renal replacement therapy, cell saving, coagulation studies. (Total notional time: 240 hours)

BIOMEDICAL APPARATUS IV IN: CRITICAL CARE (CCB408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate integrated knowledge and engagement in the Critical Care speciality at the forefront of Clinical Technology and covers; advanced ventilation, advanced haemodynamic monitoring, theatre procedures, paediatric ventilation, paediatric monitoring, and vascular ultrasonography. (Total notional time: 120 hours)

BIOMEDICAL APPARATUS III IN: NEPHROLOGY (NEB307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Biomedical Apparatus in Nephrology and covers; history of dialysis, water treatment, and haemodialysis and peritoneal dialysis. (Total notional time: 240 hours)

BIOMEDICAL APPARATUS IV IN: NEPHROLOGY (NEB408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate integrated knowledge and engagement in the Nephrology speciality at the forefront of Clinical Technology and covers; acute haemodialysis therapy, continuous renal replacement therapies, apheresis therapies, and haemoperfusion. (Total notional time: 120 hours)

BIOMEDICAL APPARATUS III IN: NEUROPHYSIOLOGY (NRB307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Biomedical Apparatus in Neurophysiology and covers; clinical electroencephalography, normal, abnormal, and epileptiform EEG, activation techniques, nerve conduction studies, somatosensory evoked potentials, brainstem auditory evoked potentials, visual evoked potentials. (Total notional time: 240 hours)

BIOMEDICAL APPARATUS IV IN: NEUROPHYSIOLOGY (NRB408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate integrated knowledge and engagement in the Neurophysiology speciality at the forefront of Clinical Technology and covers; quantitative electroencephalography, normal neonatal and paediatric EEG, abnormal neonatal and paediatric EEG, polysomnography, sleep disorders, uncommon and advanced nerve conduction studies, paediatric nerve conduction studies, transcranial doppler, and basic concepts of Intraoperative neuromonitoring. (Total notional time: 120 hours)

BIOMEDICAL APPARATUS III IN: PULMONOLOGY (PLB307P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to integrate knowledge of Biomedical Apparatus in Pulmonology and covers; infection control techniques, spirometer, lung volumes and gas distribution, diffusion apparatus, blood gas analysis, and provocation studies. (Total notional time: 240 hours)

BIOMEDICAL APPARATUS IV IN: PULMONOLOGY (PLB408P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate integrated knowledge and engagement in the Pulmonology area at the forefront of Clinical Technology and covers; bronchoscopy, cardiopulmonary exercise testing, respiratory muscle function testing, ventilation and ventilatory Control, sleep studies, and procurement of apparatuses. (Total notional time: 120 hours)

BIOMEDICAL APPARATUS III IN: REPRODUCTIVE BIOLOGY (RDB307P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to integrate knowledge of Biomedical Apparatus in Reproductive Biology and covers; external quality control, andrology, setting up of a spermatology laboratory, cryopreservation, assisted reproductive technology, computer-aided sperm analysis, handling semen with pathogens or blood-borne viruses, oocyte retrieval, risk management. (Total notional time: 240 hours)

BIOMEDICAL APPARATUS IV IN: REPRODUCTIVE BIOLOGY (RDB408P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to integrate knowledge of Biomedical Apparatus in Reproductive Biology and covers; insemination methods and fertilisation, intra cytoplasmic sperm injection, cryopreservation of oocytes, zygotes, embryos and blastocysts, frozen thawed embryo transfers, assisted reproductive technology outcomes, third party reproduction (sperm, oocytes, embryos, blastocysts), and laboratory management. (Total notional time: 120 hours)

BIOMETRICS (BIM118G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Mathematics and Statistics)
This module prepares the student to function effectively in a scientific environment and apply the key terms and techniques in the field of statistics (descriptive statistics and statistical inference). Descriptive statistics include graphical techniques and numerical descriptive measures to summarise and present the data to yield useful information, allowing persons to make decisions and recommendations. Statistical inference includes Process of making estimations, predictions and decisions about a population based on sample data. (Total notional time: 120 hours)

BIOMETRICS (BIT108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Crop Sciences)
This module prepares the student to function effectively in a scientific environment and apply the key terms and techniques in the field of statistics (descriptive statistics and statistical inference). It will provide the student with integrated knowledge as well as an ability to apply and evaluate the key terms, concepts, facts, principles, rules, and theories of biometrics as applied to the related fields of study in agricultural sciences. The module will further provide the student with competencies such as, but not limited to, review, design, analysis, writing, and reporting. (Total notional time: 120 hours)

BIOPHARMACEUTICS AND PHARMACOLOGY (BPY107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
Physiology of the gastro-intestinal tract and drug absorption. Concept of drug bioavailability including routes of drug administration, physiology of the GIT and factors that affect bioavailability. Dosage regimens and routes of drug administration. An introduction to basic pharmacology. Drug disposition (absorption, distribution metabolism and excretion) in the body. Fundamental knowledge of drug pharmacokinetics, bioavailability and pharmacology as used in comparative bioavailability studies. Bioequivalence. Students will develop skills in determining bioavailability of drugs using in-vitro and in-vivo methods as well as using data from such studies to determine bio-equivalence. (Total notional time: 240 hours)

BIOTECHNOLOGY CULTIVATION TECHNOLOGY II (BCT216D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biotechnology and Food Technology)
Isolation of Microorganisms. Microbial growth. Screening of microorganisms. Setting up a fermentation laboratory – Instrumentation. Bioreactors. pH and dissolved oxygen sensors. Sterilisation. Inoculum development. Fed batch and continuous cultures. Product recovery. Fermentation economics. (Total notional time: 180 hours)

BIOTECHNOLOGY PROFESSIONAL DEVELOPMENT II (BPD206D) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biotechnology and Food Technology)
Ordering and safekeeping of chemicals. Budgeting for a single determination using standard methods. Writing of laboratory protocol from a standard method. Data analyses: Introduction data analyses: graph selection, variables (dependents and independents), drawing graphs, interpretation of data. Laboratory practice. Operation of apparatus. Establishment of repeatability and reliability of experimentation and scientific data. (Total notional time: 240 hours)

BOTANY I (BOT105D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Horticulture)
The role of plants in the living world. The plant Kingdom, endemic, indigenous, exotic, history and development. Plant classification. Classification systems. Morphology of higher plants. Seed, roots, stems, leaves, inflorescences, flowers, fruit. Anatomy of higher plants. Plant cells and cellular components, roots, stems and leaves. Plant physiology. Photosynthesis, respiration. Transpiration and water movement in the plant. Transpiration and water movement, mineral uptake and sugar translocation. (Total notional time: 240 hours)

BUILDING CONSTRUCTION I (FCO115D, FCO115U) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Identify unsafe conditions during building construction: building processes and site works, building drawings, foundation, earthwork and concrete, walls and partitions, fireplaces, floor structures and finishing, roofs, glazing and windows, doors, and stairs. (Total notional time: 120 hours)

BUILDING CONSTRUCTION II (FCO216D, FCO216U) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Identify hazards: fire detection and alarm systems, water supply, fire pumps, automatic sprinkler systems, standpipe and hose systems, special extinguishing systems, and portable fire extinguishers. (Total notional time: 120 hours)

BUILDING CONSTRUCTION III (FCO316D, FCO316U) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Fire safety and the National Building Regulations: preliminary plans and enquiries, classification and designation of occupancies, fire protection plan, fire performance, fire resistance of occupancy and division, separating elements, fire stability of structural elements or components. (Total notional time: 120 hours)

BUSINESS PRACTICE (BPR107V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
Theoretical knowledge of advanced principles of supervision and management and how to apply these principles in practice and is a part requirement to be registered with the SADTC as a Dental Technologist entitling the student to be a laboratory owner, be an employer, and supervise a dental laboratory. (Total notional time: 120 hours)

BUSINESS PRACTICE I (BSP206D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Management and Entrepreneurship)
Introduction to the business world, marketing orientation, non-verbal and verbal communication, written business communication, professional ethics, selling techniques, sales administration. (Total notional time: 120 hours)

BUSINESS PRACTICE I (1SP305D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
Basic accounting, as well as the layout of offices and the management and administration of a business. (Total notional time: 120 hours)

BUSINESS PRACTICE II (BSP306D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Management and Entrepreneurship)

Identifying market opportunities, locating the clinic, product and service strategy, pricing strategy, advertising, sales promotions, public relations, legal aspects. (Total notional time: 120 hours)

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CARDIOVASCULAR PHARMACY (CAP245P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

An overview of the anatomy and physiology of the cardiovascular and renal systems. The pathophysiology of the major disorders affecting the cardiovascular and renal systems. The pharmacology of the therapeutic agents, including antimicrobials, used to treat these disorders. (Total notional time: 180 hours)

CATALYSIS (CTI118G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Chemistry)

Fundamentals of catalysis. Biocatalysis. Homogeneous catalysis. Heterogeneous catalysis. Catalysts deactivation and regeneration. (Total notional time: 150 hours)

CELL BIOLOGY I (CBI115P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an informed understanding of Cell Biology in the field of medical laboratory science. The student will be able to relate his/her knowledge of the organisation of cells, amino acids and proteins, enzymes, carbohydrates, lipids, nucleic acids and reagents, pH and buffers to the field of human biochemistry to attain an informed awareness and understanding of core disciplines in medical laboratory science. (Total notional time: 120 hours)

CHEMICAL PROCESS INDUSTRIES II (CAL216P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemical, Metallurgical and Materials Engineering)

Introduction to chemical process industries; Petroleum refining; Pulp and paper manufacturing; Mineral Processing; Bulk manufacturing of ammonia and hydrogen; Bulk manufacturing of nitric acid, carbon dioxide and sulphuric acid; Air separation technologies: oxygen and nitrogen; Coal and coal processing; and Renewable energy technologies. (Total notional time: 180 hours)

CHEMICAL QUALITY ASSURANCE III (CQA316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Introduction to Chemical Quality Assurance. Sampling methods. Validation of Analytical methods. Statistics in Analytical Chemistry. Quality Control Techniques. Documents for Quality Assurance. Organising, auditing and Standard Operating Procedures. Laboratory facilities and Information Management Systems. International standards and Laboratory Accreditation. (Total notional time: 120 hours)

CHEMISTRY I (CHE105P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Matter; Atoms, molecules, and ions; Basic concepts in chemical bonding; Chemical reactions and stoichiometry; Reactions in aqueous solutions; Acids and bases; Chemistry of the environment; Introductory organic chemistry. (Total notional time: 150 hours)

CHEMISTRY I (CHM105X) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

The role and importance of chemistry in everyday life. Classification and properties of matter. Units of measurement. Atoms, molecules and ions. The modern view of atomic structure and the use of electron configurations in chemical bonding. The periodic table of elements. The use of IUPAC rules for naming inorganic compounds. Application of the mole concept in stoichiometric calculations. Reactions in aqueous solutions. Chemical equilibrium. Fundamental concepts in electrochemistry. Organic nomenclature. (Total notional time: 240 hours)

CHEMISTRY FOR HEALTH SCIENCES (CHI115P) **1 X 3-HOUR PAPER**
CHEMISTRY FOR HEALTH SCIENCES I (CHC115P, CHS115P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemistry)
The student will be able to apply his/her knowledge of atomic theory, nomenclature, stoichiometry, chemical equilibrium, organic chemistry and gases and liquids to basic chemistry related problems. Upon completion, the student will be able to discuss fundamental concepts in chemistry and do related calculations. (Total notional time: 120 hours)

CHROMATOGRAPHY (CTG117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemistry)
Principles of gas, liquid and planar chromatography. Kinetic variables and parameters affecting efficient chromatographic separations. Selecting the most appropriate experimental conditions and parameters for separation and identification of compounds. Applications of liquid, high performance thin layer and gas chromatography. (Total notional time: 120 hours)

CHROMATOGRAPHY III (CTG316D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemistry)
Principles of chromatography. Classification of chromatographic methods. Van Deempter equation and the application thereof. Optimisation of column performance. Applications of chromatography. Gas and liquid chromatography instrumentation. Planar chromatography. (Total notional time: 180 hours)

CLINICAL CHEMISTRY II (CCI206P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to apply detailed knowledge of Clinical Chemistry in the field of medical laboratory science. The student will be able to apply his/her knowledge of specimen handling, laboratory automation and analytical techniques, electrolytes, minerals, vitamins, trace elements, blood gas systems, amino acids and proteins, body fluids, enzymes, the kidney and tests of renal function and the liver and tests of hepatic function as related to pathobiochemistry. (Total notional time: 240 hours)

CLINICAL CHEMISTRY III (CCI317P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to integrate knowledge of Clinical Chemistry in the field of medical laboratory science. The student will be able to apply his/her knowledge of endocrinology, carbohydrates, lipids, tumour markers and pharmacology to the field of pathobiochemistry to attain practical and professional competence in the workplace. (Total notional time: 120 hours)

CLINICAL EDUCATION AND MENTORING I (CDG408P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
The student will acquire in-depth knowledge of aspects relating to clinical teaching, learning, assessment, and mentoring of clinical technologists in training. The module will cover knowledge of Work-Integrated Learning, Strategies of teaching and learning, Clinical assessment practices, Reflection-in and -on learning experiences, as well as the successful mentoring of students during clinical training. (Total notional time: 120 hours)

CLINICAL EXERCISE TESTING AND EVALUATION I (CVA105P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
The student will be able to apply his/her knowledge of foundational principles in exercise testing and prescription for apparently healthy individuals. Both field and laboratory testing will be learnt to facilitate the assessment/interpretation of health and skills-related components of fitness. Principles in exercise prescription using technological equipment and software will be learnt, in accordance with the FIIT Principle, to improve functional performance and health promotion. (Total notional time: 280 hours)

CLINICAL EXERCISE TESTING AND EVALUATION II (CVA206P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student to test readiness for exercise and prescribe individualised exercise programs for healthy populations, special populations, and chronic disease patients, which include the pathophysiology of cardiovascular, metabolic, and pulmonary disease. Clinical and laboratory testing will be learnt to facilitate the assessment/interpretation of healthy, special and the diseased populations. (Total notional time: 290 hours)

CLINICAL EXERCISE TESTING AND EVALUATION III (CVA307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student to test readiness for exercise and prescribe individualised exercise programmes for persons with orthopaedic disabilities, immunological disease, neuromuscular disorders, cognitive/sensory deficits, and special populations. Clinical and laboratory testing will be learnt to facilitate the assessment/interpretation of clinical and diseased patients. (Total notional time: 130 hours)

CLINICAL EXERCISE TESTING AND EVALUATION IV (CVA408P) **PRACTICAL ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student to test readiness for exercise and prescribe individualised exercise programmes for multiple chronic conditions. The student will be able to apply his/her knowledge of exercise readiness and prescription for multiple chronic conditions. The student will be based at clinical sites, conducting cardiac; metabolic; pulmonary; immunological; orthopaedic; neuromuscular; cognitive and special population exercise testing and prescription under supervision. (Total notional time: 120 hours)

CLINICAL LABORATORY PRACTICE III (CLR317P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrated, apply and evaluate knowledge of Clinical Chemistry, Cytology, Haematology, Histology and Medical Microbiology and related disciplines in the field of medical laboratory science. The student will be able to select, perform, interpret and integrate diagnostic laboratory tests in and across specific medical disciplines in accordance with statutory requirements within a real-world setting. Furthermore, through the integration of the theoretical and practical component of this module, the student will acquire knowledge, skills, and values in clinical laboratory practice to manage him/herself on an elevated professional level, as well as the awareness to take responsibility for the learning of others in a professional career environment, contributing to highly skilled scientists in laboratory medicine. (Total notional time: 600 hours)

CLINICAL LABORATORY PRACTICE IV IN: CLINICAL CHEMISTRY (CCI408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate forefront knowledge of Clinical Chemistry in the field of medical laboratory science. The student will be able to apply and evaluate his/her knowledge of principles, procedures and correlation for diagnostic testing and organ-specific function testing for chemical pathology. (Total notional time: 900 hours)

CLINICAL LABORATORY PRACTICE IV IN: CLINICAL PATHOLOGY (CPH408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to be able to demonstrate forefront knowledge and the application of Clinical Chemistry, Haematology and Medical Microbiology and related disciplines in the field of medical laboratory medicine. The student will be able to apply and evaluate his/her knowledge of principles, procedures and correlation for diagnostic testing in the combined disciplinary knowledge for applied clinical pathology to attain practical and professional competence in the workplace. (Total notional time: 900 hours)

CLINICAL LABORATORY PRACTICE IV IN: CYTOGENETICS (CGE408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

The student will be able to demonstrate clinical competency of principles and procedures of molecular genetics to attain practical and professional competence in the workplace. (Total notional time: 900 hours)

CLINICAL LABORATORY PRACTICE IV IN: CYTOLOGY (CYT408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate forefront knowledge and the ability to recognise and evaluate cellular morphology of the cervical, vaginal, respiratory, urinary, gastro-intestinal tract, serous cavities, central nervous system, breast, thyroid and lymph node and to apply specialised knowledge to differentiate between different cells and cellular changes, including benign and malignant changes. The student will be able to apply his/her knowledge of cytological techniques to evaluate and diagnose the cellular changes viewed on the cytological smears. (Total notional time: 900 hours)

CLINICAL LABORATORY PRACTICE IV IN: HAEMATOLOGY (HTY408P) 1 X 3-HOUR PAPER
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate forefront knowledge of Haematology in the field of medical laboratory medicine. The student will be able to demonstrate clinical competency of performing routine as well as specialised investigations in Haematology and to interpret the results obtained efficiently to attain practical and professional competence in the workplace. (Total notional time: 900 hours)

CLINICAL LABORATORY PRACTICE IV IN: HISTOLOGY (HST408P) 1 X 3-HOUR PAPER
(Module custodian: Department of Biomedical Sciences)
The student will be able to apply and evaluate the safe practices and instrumentation used in the routine histology laboratory and provides forefront knowledge and skills in histological techniques of tissue collection, accessing, grossing, decalcification, fixation, processing, embedding, microtomy, staining and mounting. (Total notional time: 900 hours)

CLINICAL LABORATORY PRACTICE IV IN: IMMUNOHAEMATOLOGY (IHM408P) 1 X 3-HOUR PAPER
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate forefront knowledge of Immunohaematology in the field of medical laboratory medicine. The student will be able to demonstrate clinical competency of laboratory regulations, ethics, equipment, quality assurance, blood donation, blood testing and the risks that are associated with transfusions, efficiently to attain practical and professional competence in the workplace. (Total notional time: 900 hours)

CLINICAL LABORATORY PRACTICE IV IN: IMMUNOLOGY (IMM408P) 1 X 3-HOUR PAPER
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate forefront knowledge of Immunology in the field of medical laboratory medicine. The student will be able to apply and evaluate his/her knowledge of principles and procedures in the scientific study of the immune response related to the diagnosis of primary immunodeficiency and autoimmune disease; allergic responses and transplantation/immunogenetics. Interpretation and assessment through complete comprehension of the principles of diagnostic methods and techniques applied in the laboratory setting to attain practical and professional competence in the workplace. (Total notional time: 900 hours)

CLINICAL LABORATORY PRACTICE IV IN: MEDICAL MICROBIOLOGY (MMI408P) 1 X 3-HOUR PAPER
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate forefront knowledge of medical microbiology in the field of medical laboratory medicine. The student will be able to apply and evaluate his/her knowledge of principles, procedures and correlation for diagnostic testing and organ-specific function testing for medical microbiology to attain practical and professional competence in the workplace. (Total notional time: 900 hours)

CLINICAL LABORATORY PRACTICE IV IN: VIROLOGY (VIR408P) 1 X 3-HOUR PAPER
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate forefront knowledge of virology in the field of medical laboratory medicine. The student will be able to apply and evaluate his/her knowledge of principles, procedures and correlation for diagnostic testing and organ-specific function testing for virology to attain practical and professional competence in the workplace. (Total notional time: 900 hours)

CLINICAL MANAGEMENT IN SOMATIC THERAPY IV (STY107V) CONTINUOUS ASSESSMENT
(Module custodian: Department of Pharmaceutical Sciences)
Evidence for therapeutic massage for a specific physical or emotional condition; Evidence for stress management and relaxation therapy for a specific physical or emotional condition; Evidence for micropigmentation implantation techniques for reconstructive purposes; and Portfolio of Evidence. (Total notional time: 240 hours)

CLINICAL NURSE AND MIDWIFE TRAINING II (WIL) (CNM206P) WORK-INTEGRATED LEARNING
(Module custodian: Adelaide Tambo School of Nursing Science)
This module prepares the student to demonstrate an ability to use scientific nursing process in the practice of nursing to apply standard methods, procedures or techniques within the field, discipline or practice, and to plan and manage an implementation process within a supported environment. The student will be able to apply his/her knowledge of nursing practice to individual patients, families and communities. (Total notional time: 420 hours)

CLINICAL NURSE AND MIDWIFE TRAINING III (WIL) (CNM307P) **WORK-INTEGRATED LEARNING**
(Module custodian: Adelaide Tambo School of Nursing Science)
This module prepares the student to apply methods of enquiry in nursing and midwifery practice, and their suitability to specific investigations; and an ability to select and apply a range of methods to resolve problems or introduce change within a practice. The student will be able to apply his/her knowledge of nursing and midwifery practice to individual patients, families and communities. Upon completion of the module, the student will be able to perform core nursing and midwifery care of a client in respect of vulnerable patients/clients and those with special needs such as children, the aged; youth health and the working community. Providing curative services according to all the bodily systems as well as midwifery care during childbearing. (Total notional time: 420 hours)

CLINICAL NURSE AND MIDWIFE TRAINING IV (WIL) (CNM408P, CNM418R) **WORK-INTEGRATED LEARNING**
(Module custodian: Adelaide Tambo School of Nursing Science)
This module prepares the student to demonstrate understanding of the complexities and uncertainties of selecting, applying or transferring appropriate standard procedures, processes or techniques to unfamiliar problems in a nursing and midwifery practice. The student will be able to apply his/her knowledge of nursing and midwifery practice to individual patients, families and communities. Upon completion of the module, the student will be able to perform core nursing and midwifery care of a client in respect of individual, family and community. Providing prevention, promotion, curative and rehabilitative health throughout lifespan appreciating all the complexities and integrating teams and systems. Upon completion, the student is able to demonstrate an ability to critically review information gathering, synthesis of data, evaluation and management processes in specialised contexts in order to develop creative responses to problems and issues. (Total notional time: 600 hours)

CLINICAL NURSE TRAINING I (WIL) (CNR105P) **WORK-INTEGRATED LEARNING**
(Module custodian: Adelaide Tambo School of Nursing Science)
This module prepares the student to demonstrate an ability to select and apply standard methods, procedures or techniques within the field, discipline or practice, and to plan and manage an implementation process within a supported environment. The student will be able to apply his/her knowledge of nursing practice to individual patients, families and communities. Upon completion of the module, the student will be able to perform fundamental nursing care of a client in respect of meeting the need for; homeostasis, ventilation and maintenance, elimination, nutritional, safety, mobility and exercise, comfort rest and sleep; loss and grieving, first aid and health promotion including professional self-awareness. (Total notional time: 250 hours)

CLINICAL PROFESSIONAL PRACTICE I (CLP105P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
The student will be able to demonstrate the ability to take account of and act in accordance with prescribed health and medical organisations as well as the professional ethics codes of conduct, values and practices. Through this module, students will obtain the ability to communicate information reliably, accurately and coherently as well as the ability to account for their actions. Finally, the student should understand the relationship of the anatomical and physiological systems during emergency medical care. (Total notional time: 120 hours)

CLINICAL PROFESSIONAL PRACTICE II (CLP206P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
The student will be able to demonstrate an understanding of the ethical implications of decisions and actions as well as the complexity of ethical dilemmas. Through this module, a student will obtain the ability to present and communicate complex medical information reliably. Finally, the student should understand the relationships between organ systems during emergency medical care. (Total notional time: 120 hours)

CLINICAL PROFESSIONAL PRACTICE III (CLP307P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
The student will be able to demonstrate the ability to take decisions and act ethically and professionally in a familiar healthcare environment. Through this module, a student will obtain the ability to communicate ideas and opinions in well-formed oral and written arguments and facilitate collaborative learning. Finally, the student should recognise that problem-solving does not occur in isolation, and manage clinical procedures in dynamic emergency medical care environments. (Total notional time: 120 hours)

CLINICAL PROFESSIONAL PRACTICE IV (CLP408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

The student will be able to demonstrate the ability to identify and address ethical and legal issues based on critical reflection in an unfamiliar healthcare environment. Through this module, a student will obtain the ability to communicate accurate academic and professional information and knowledge as well as design and implement appropriate teaching strategies. Finally, the student should recognise that problem-solving does not occur in isolation, and manage emergency procedures in dynamic medical care environments. (Total notional time: 120 hours)

CLINICAL RADIOGRAPHIC EDUCATION AND MENTORING (CRM408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire forefront knowledge of all aspects relating to clinical teaching, learning and mentoring to attain practical and professional competence of radiography students in the workplace. The student will be able to apply his/her knowledge of Work Integrated Learning, Strategies of teaching and learning, Clinical assessment practices, Reflection-in and -on learning experiences, as well as the successful mentoring and coaching of students during the clinical training phase. Furthermore, through the integration of the theoretical and practical component of this module, the student will acquire knowledge, skills, and values in clinical practice to manage him/herself on an elevated professional level, as well as the awareness to take responsibility for the learning of others in a professional career environment, contributing to high quality clinical radiography education. (Total notional time: 180 hours)

CLINICAL RADIOGRAPHIC PRACTICE I (CRP105P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate basic radiographic knowledge to ultimately become professional, competent radiographers who are able to work in a multi-disciplinary health environment. The student will be able to apply his/her knowledge of Clinical Radiographic Practice within simulated environments. This module is an integrated theory and work-integrated learning, with emphasis mainly on workplace-based learning. (Total notional time: 120 hours)

CLINICAL RADIOGRAPHIC PRACTICE II (CRP206P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate basic and specialised radiographic knowledge to ultimately become professional, competent radiographers who are able to work in a multi-disciplinary health environment. The student will be able to apply his/her knowledge of Clinical Radiographic Practice within simulated and clinical environments. The student will furthermore be able to apply his/her knowledge of the field of medical law, bioethics and human rights, as well as the integrated field of psychodynamics, to clinical professional practice in a healthcare context. This module displays an integration of clinical-orientated theoretical knowledge and workplace-based learning. (Total notional time: 240 hours)

CLINICAL RADIOGRAPHIC PRACTICE III (CRP307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate, demonstrate and apply specialised radiographic knowledge and skills to ultimately become professional, competent radiographers who are able to work in a multi-disciplinary health environment. The student will be able to apply his/her integrated and applied knowledge of Anatomy, Physiology, Advanced Pathology, Pattern Recognition, Imaging, basic research and computer literacy within clinical radiography environment. This module is a clinical orientated theory and WIL integrated module with the emphases mainly on Workplace-based learning. (Total notional time: 240 hours)

CLINICAL RADIOGRAPHIC PRACTICE IV (CRP408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to apply, integrate, and demonstrate in-depth forefront knowledge, skills and applicable attitudes to a range of advanced imaging modalities and associated advanced technology in the field of Diagnostic Radiography, to be able to authentically perform specified specialised diagnostic examinations and procedures required at this level and also required for the student to become a highly skilled qualified diagnostic radiographer who can work independently in a multi-disciplinary health environment. The student will, furthermore, be able to apply his/her knowledge of medical law, bioethics and human rights to clinical professional practice, as well as the psycho-dynamics of patient management in a healthcare context. (Total notional time: 120 hours)

CLINICAL RESEARCH (CRS107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

The central areas of pre-clinical research and development, applying the key terms, concepts, facts, principles, rules and theories in pre-clinical research, clinical trial design in accordance with the ICH Guidelines with emphasis on controls in clinical trials. Clinical trial protocols and regulatory authority and independent ethics committee approval. Life cycle of a clinical trial. Ethical aspects of clinical trials. Good Clinical Practice. Good Laboratory Practice. (Total notional time: 240 hours)

CLINICAL RESEARCH (CRS108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

This module prepares students to demonstrate knowledge of and engagement in an area at the forefront of clinical research, and an understanding of the theories, research methodologies, methods and techniques relevant to clinical research, discipline or practice; and an understanding of how to apply such knowledge in a particular context. The module covers a wide range of topics associated with designing clinical trials, developing and writing clinical trial protocol, planning and conducting clinical trials and interpreting safety and efficacy data: developing methods for clinical trial design, an understanding of the theories, research methodologies, methods and techniques as well as the general considerations relevant to the design of clinical trials in a South African as well as international context; the key terms, concepts, facts and principles in the writing of a clinical trial protocol; the planning and application of special types of clinical trials, the different steps in the planning and conducting a single clinical trial; safety and efficacy data in a clinical trial; and problems of clinical data interpretation. (Total notional time: 420 hours)

CLINICAL SCIENCE PRACTICE II (CLC206P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate the ability to evaluate, select and apply appropriate standard procedures and covers the following Competency-Based Assessments; non-invasive oximetry and non-invasive blood pressure measurement, basic resting electrocardiogram, activated clotting time measurement, blood gas sampling, anthropometric measurements, respiratory rate measurements, temperature measurement, radial and tibial pulse measurement, non-provocative nebulizers, oxygen therapy masks, setting of pressure transducers, ventilators and infusion devices, automated external defibrillator, spirometry measurements, and phlebotomy. (Total notional time: 120 hours)

CLINICAL SCIENCE PRACTICE III IN: CARDIOLOGY (CYE307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an understanding of a range of standard procedures in cardiology and covers the following Competency-Based Assessments; defibrillation and cardioversion, resting and exercise stress ECG, intra-aortic balloon pump, temporary and permanent pacemakers, adult sonography, and adult cardiac catheterisation. (Total notional time: 180 hours)

CLINICAL SCIENCE PRACTICE IV IN: CARDIOLOGY (CYE408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an understanding of the complexities and uncertainties of selecting and applying standard procedures in Cardiology to unfamiliar problems and covers the following Competency-Based Assessments; electrocardiography, high powered pacemakers, paediatric sonography, adult intervention cardiac catheterisation, paediatric cardiac catheterisation. (Total notional time: 240 hours)

CLINICAL SCIENCE PRACTICE III IN: CARDIOVASCULAR PERFUSION (VAE307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an understanding of a range of standard procedures in Cardiovascular Perfusion and covers the following Competency-Based Assessments; cell saving, cardiopulmonary bypass circuit setup and de-air, cardioplegia, suckers and venting of the heart, intra-aortic balloon pump, adult cardiopulmonary bypass, extra-corporeal membrane oxygenation, maze and ablation setup, and nitric oxide dosing setup and management. (Total notional time: 180 hours)

CLINICAL SCIENCE PRACTICE IV IN: CARDIOVASCULAR PERFUSION (VAE408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an understanding of the complexities and uncertainties of selecting and applying standard procedures in Cardiovascular Perfusion to unfamiliar problems and covers the following Competency-Based Assessments; advanced intra-aortic balloon pump, complex adult cardiopulmonary bypass, paediatric cardiopulmonary bypass, neonatal cardiopulmonary bypass, cardiopulmonary bypass during deep hypothermic circulatory arrest, and extra corporeal membrane oxygenation. (Total notional time: 240 hours)

CLINICAL SCIENCE PRACTICE III IN: CRITICAL CARE (CCE307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an understanding of a range of standard procedures in Critical Care and covers the following Competency-Based Assessments; blood gas analysis; haemodynamic monitoring, ventilation, cell saving, anaesthesia, and emergency procedures. (Total notional time: 180 hours)

CLINICAL SCIENCE PRACTICE IV IN: CRITICAL CARE (CCE408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an understanding of the complexities and uncertainties of selecting and applying standard procedures in Critical Care to unfamiliar problems and covers the following Competency-Based Assessments; acute dialysis, advanced ventilation, advanced haemodynamic monitoring, paediatric ventilation, thromboelastometry, and vascular ultrasonography. (Total notional time: 240 hours)

CLINICAL SCIENCE PRACTICE III IN: NEPHROLOGY (NEE307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an understanding of a range of standard procedures in Nephrology and covers the following Competency-Based Assessments; patient preparation, water treatment, pre-dialysis assessment and anticoagulation therapy, blood sampling techniques, peritoneal dialysis documentation, renal dialysis design. (Total notional time: 180 hours)

CLINICAL SCIENCE PRACTICE IV IN: NEPHROLOGY (NEE408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an understanding of the complexities and uncertainties of selecting and applying standard procedures in Nephrology to unfamiliar problems and covers the following Competency-Based Assessments; acute haemodialysis treatment, peritoneal dialysis treatment, continuous renal therapies, plasmapheresis, kidney transplant, and advanced renal dialysis design. (Total notional time: 240 hours)

CLINICAL SCIENCE PRACTICE III IN: NEUROPHYSIOLOGY (NRE307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an understanding of a range of standard procedures in Neurophysiology and covers the following Competency-Based Assessments; electroencephalography, nerve conduction studies, somatosensory evoked potentials, auditory brainstem responses, visual evoked potentials, artefact atlas. (Total notional time: 180 hours)

CLINICAL SCIENCE PRACTICE IV IN: NEUROPHYSIOLOGY (NRE408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an understanding of the complexities and uncertainties of selecting and applying standard procedures in (Category) to unfamiliar problems and covers the following Competency-Based Assessments; paediatric and neonatal electroencephalography, advanced nerve conduction studies, somatosensory evoked potentials, advanced auditory brainstem responses, advanced visual evoked potentials, and polysomnography. (Total notional time: 240 hours)

CLINICAL SCIENCE PRACTICE III IN: PULMONOLOGY (PLE307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate an understanding of a range of standard procedures in Pulmonology and covers the following Competency-Based Assessments; infection control, prevention and safety, spirometry, lung volumes and gas distribution, diffusion, blood gas analysis, and provocation studies. (Total notional time: 180 hours)

CLINICAL SCIENCE PRACTICE IV IN: PULMONOLOGY (PLE408P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate an understanding of the complexities and uncertainties of selecting and applying standard procedures in Pulmonology to unfamiliar problems and covers the following Competency-Based Assessments; bronchoscopy; cardiopulmonary exercise testing, respiratory muscle function testing, ventilation and ventilatory control, and sleep studies. (Total notional time: 240 hours)

CLINICAL SCIENCE PRACTICE III IN: REPRODUCTIVE BIOLOGY (RBE307P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate an understanding of a range of standard procedures in Reproductive Biology and covers the following Competency-Based Assessments, semen/sperm processing and analysis. therapeutic processing, computer-aided sperm analysis, media preparation, oocyte retrieval, in vitro fertilisation inseminations and denudation, cryopreservation of sperm, alternative sperm tests, and quality control. (Total notional time: 180 hours)

CLINICAL SCIENCE PRACTICE IV IN: REPRODUCTIVE BIOLOGY (RBE408P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate an understanding of a range of standard procedures in Reproductive Biology and covers the following Competency-Based Assessments; patient interaction sessions, sperm retrieval procedures, intracytoplasmic sperm injection, embryo evaluations, embryo transfer, cryopreservation management, trophectoderm biopsy and genetic testing, time-lapse imaging, and assisted hatching. (Total notional time: 240 hours)

CLINICAL VETERINARY TECHNOLOGY II (CVT206P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to acquire an informed understanding of principles of methods, techniques and procedures in biochemistry, microbiology, haematology, immunology, serology and histology. The student will be able to demonstrate the ability to identify, define and evaluate routine and new calculations and scientific problems in the respective disciplines. Through this module, students will obtain the ability to integrate aspects of theoretical knowledge and methodology to the application thereof in the different disciplines' laboratory fields. (Total notional time: 240 hours)

CLINICAL VETERINARY TECHNOLOGY III IN ENTOMOLOGY (EMY307P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to be able to demonstrate integrated knowledge of the arthropod morphology, taxonomic classification, ecology, epidemiology, pathogen transmission and zoonotic significance to effectively choose and apply appropriate diagnosis, prevention, biochemical control and eradication strategies. Furthermore, the student will be able to demonstrate the ability to apply advanced knowledge of various principles and methods in evaluating and selecting the appropriate identification and diagnostic tools and techniques for diagnosis of parasitic arthropods and related infections. (Total notional time: 180 hours)

CLINICAL VETERINARY TECHNOLOGY III IN HELMINTHOLOGY (HMY307P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to be able to demonstrate integrated knowledge of the helminth morphological characteristics, taxonomic classification, ecology, epidemiology and zoonotic significance to effectively choose and apply appropriate control and eradication strategies. (Total notional time: 180 hours)

CLINICAL VETERINARY TECHNOLOGY III IN MOLECULAR BIOLOGY (MCB307P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares the students to acquire integrated knowledge, understanding and the application of biology on a molecular level including the structure, function, and makeup of biologically important macromolecules such as DNA, RNA, and proteins. Molecular biology explores cells, their characteristics, parts, and chemical processes. Students will gain the ability to select and apply techniques, methods and procedures in order to perform clinical laboratory procedures/tests pertaining to the molecular biology discipline. (Total notional time: 240 hours)

CLINICAL VETERINARY TECHNOLOGY IV IN MOLECULAR BIOLOGY (MCB408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares students to acquire forefront knowledge of the fundamental aspects of Molecular Biology in the field of Veterinary Technology and biological research. Students will be able to apply their knowledge of techniques such as PCR, gene cloning, gene sequencing, laboratory automation and molecular biology-based analytical techniques to offer solutions to simple and complex problems and answer routine diagnostic questions related to the field of Veterinary Technology. (Total notional time: 240 hours)

CLINICAL VETERINARY TECHNOLOGY III IN PROTOZOOLOGY (PZY307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to be able to demonstrate integrated knowledge of protozoan morphological characteristics, taxonomic classification, ecology, epidemiology and zoonotic significance to effectively choose and apply appropriate control and eradication strategies. (Total notional time: 180 hours)

CLINICAL VETERINARY TECHNOLOGY III IN VIROLOGY (VLY307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares students to integrate the acquired in depth theoretical knowledge and understanding of the concepts and theories of virology with the clinical laboratory practice environment through a structured and managed Work-Integrated Learning programme. (Total notional time: 180 hours)

CLINICAL VETERINARY TECHNOLOGY IV IN VIROLOGY (VLY408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares students to acquire in-depth and analysed theoretical knowledge and understanding of the concepts and theories related to specific Single- and Double-stranded RNA, and DNA viruses and their presence in the veterinary environment, as well as the application of knowledge in clinical laboratory practice through a structured and managed Work-Integrated Learning programme. Students will gain the ability to select and apply a range of techniques, methods and procedures in order to perform clinical laboratory procedures/tests pertaining to single- and double-stranded RNA, and DNA viruses (Total notional time: 240 hours)

CLINICAL VETERINARY TECHNOLOGY III IN VETERINARY MICROBIOLOGY (VRM307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares students to integrate the acquired in depth theoretical knowledge and understanding of the concepts and theories of microbiology with the clinical laboratory practice environment through a structured and managed Work-Integrated Learning programme. Students will gain the ability to select and apply technology-driven standard operating procedures, clinical veterinary laboratory techniques, and methods to perform diagnostic tests pertaining to the microbiology discipline. (Total notional time: 180 hours)

CLINICAL VETERINARY TECHNOLOGY IV IN BACTERIOLOGY (BTY408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire in-depth theoretical knowledge, as well as the necessary applied skills to select methods and techniques to accurately perform diagnostic laboratory tests within the scope of Veterinary Technology. It will also prepare the students to be able to select procedures/techniques that will assist to examine and illustrate knowledge and understanding of the isolation of bacteria and fungi of veterinary importance and diagnostic problems through critical and innovative thinking being responsible and independent in decision-making and application of basic and advanced scientific techniques within the field of Veterinary Technology practice. (Total notional time: 240 hours)

CLINICAL VETERINARY TECHNOLOGY IV IN PARASITOLOGY (PAR408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire an in depth understanding and integration of the basic and advanced principles of parasitology including definitions, characteristics, parasite host interaction, epidemiology, methods of diagnosis, control and possible eradication strategies of parasites of veterinary, economic and zoonotic significance. (Total notional time: 240 hours)

COACHING MANAGEMENT IV (CHT107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student to facilitate management strategies within both the recreation and competitive sport contexts by understanding the unique demands of successful sport and event management. The student will be able to apply his/her knowledge of sport management in developing a team, communicating effectively, organising and delegating work as well as planning and managing an event. (Total notional time: 180 hours)

COACHING SCIENCE II (COC206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

The purpose of this module is to prepare the student to function successfully in an interdisciplinary environment in order to improve athletes' and sports teams' performances using the latest techniques and research. The student will be able to apply his/her knowledge of the theory and practice of physical education, sport and coaching science across education, leisure and community sectors to improve athletic performance. (Total notional time: 180 hours)

COACHING SCIENCE III (COC306D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

The purpose of this module is to prepare the student to facilitate learning and coaching within both the recreation and competitive sport contexts by understanding the unique physical characteristics as well as demands of athletes. The student will be able to apply his/her knowledge of the skills performers to optimise their sporting abilities and assist them in meeting their highest potential. (Total notional time: 200 hours)

COACHING SCIENCE IV (COC107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module equips the student with knowledge, skills and attributes to further enhance their professional career in the sport and coaching industry. It augments the student's ability to communicate, facilitate, solve problems and practice effective decision-making. The student will develop comprehensive knowledge of key issues, which supports the high-performance sports coaching environment. (Total notional time: 210 hours)

COMMUNICATION FOR ACADEMIC PURPOSE (COE105X) **1 X 3-HOUR PAPER**
COMMUNICATION FOR ACADEMIC PURPOSES (11P105U, 11P105X) **1 X 3-HOUR PAPER**

(Module custodian: Office of the Executive Dean)

A workable knowledge of English is an essential skill for any graduate who is required to conduct themselves successfully in a professional working environment. This module will equip students with the competencies required to compose a selection of written texts related to communicating both internally and externally within a professional environment. In addition, the module includes strategies that are essential for the effective communication in various situations, including small groups to avoid unproductive conflict and, a multicultural context. (Total notional time: 100 hours)

COMMUNICATION FOR ACADEMIC PURPOSES I (CAP115P) **1 X 2-HOUR PAPER**

(Module custodian: Office of the Executive Dean)

Reading skills. Listening skills. Writing skills. Presentation skills. Research report, citation and referencing. (Total notional time: 80 hours)

COMMUNICATION FOR OCCUPATIONAL PURPOSES (CPO117V) **1 X 3-HOUR PAPER**
COMMUNICATION FOR OCCUPATIONAL PURPOSES II (COP216P) **1 X 2-HOUR PAPER**

(Module custodian: Office of the Executive Dean)

Communication theory; organisational communication; small group communication; employment; internal business documentation; external business documentation; meeting procedure; marketing; stress management/self-management and human relations; multicultural interaction; career-specific vocabulary. (Total notional time: 60 hours for CPO117V and 80 hours for COP216P)

COMMUNICATION SKILLS I (COSH501) **CONTINUOUS ASSESSMENT**

(Module custodian: Office of the Executive Dean)

Communication theory. Verbal communication. Interviews. Developing leadership and participation skills. Technical writing skills. Group communication skills. Applied technical writing skills. (Total notional time: 90 hours)

COMMUNITY DEVELOPMENT II (CDV206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Development and underdevelopment. Millennium development goals. Entrepreneurship. Qualitative and quantitative techniques of community profiling. Statistics for decision-making in communities. Environmental health interventions and advocacy. (Total notional time: 150 hours)

COMMUNITY PHARMACY PRACTICE: COMMUNITY-BASED PHARMACEUTICAL CARE (CPP347P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

Administration, management skills and the philosophy of pharmaceutical care. Counselling, provision of advice and drug therapy management and their effects on the patient. Immune status importance of prevention and nutrition and their effects on the family. Epidemiology, health education and drug information and their effects on the community. The following aspects of dispensing: legal, communication with the patient and other health-care professionals, patient profiles, preparation of the prescription and record-keeping. The role of the pharmacist as a tutor. (Total notional time: 300 hours)

COMMUNITY PHARMACY WORK-BASED LEARNING (CPL347P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

Practical experience in aspects of the dispensing process, pharmacist-initiated care, communication with the patient and other health-care workers, specialist areas of community pharmacy, legal and ethical requirements and important aspects of management. (Total notional time: 180 hours)

COMPUTER LITERACY (CPL105U, CPL105X, CPL115X, LIT105D) **CONTINUOUS ASSESSMENT**
COMPUTER LITERACY I (ITC125P) **1 X 3-HOUR PAPER**

(Module custodian: End User Computing Unit)

This module provides students with foundational knowledge in computing fundamentals, essential digital skills in key applications based on MS Office Suite and network basics (i.e. MS Outlook and Internet). Online exams are mapped with End-User Computing: SAQA 49077 (61591) Core Element as well as Internet and Computing Core Certification (IC3). (Total notional time: 100 hours for CPL105U, CPL105X, CPL115X, LIT105D and 80 hours for ITC125P)

COMPUTER PROGRAMMING I (CPPH500) **1 X 3-HOUR PAPER**

(Module custodian: Department of Computer Science)

This module accommodates students from a broad spectrum of disciplines and interests. It includes a theoretical as well as a practical component. This module provides an overview coverage of introductory C++ programming. This is a career-focused information and communication technology qualification that will enable a graduate to design and create ICT software solutions using basic object-orientated concepts and technologies. Basic C++ programs, classes, problem-solving, OOP, methods, data manipulation, arithmetic operations, decision structures, loop structures, functions. (Total notional time: 150 hours)

COMPUTER SKILLS I (CSKH500) **CONTINUOUS ASSESSMENT**

(Module custodian: End User Computing Unit)

Students have to acquire theoretical knowledge (computing fundamentals) and practical skills as an end-user in operating systems and MS Office Suite applications (MS Word, MS Excel and MS PowerPoint) on an introductory level. Students will do online and computer based tests. The modules are mapped with SAQA and IC3 Essential Skills for Digital Literacy (international certification). (Total notional time: 100 hours)

CONSERVATION COMMUNICATION I (CCO206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Introduction to the basic principles of communication and creating awareness of the skills and competencies needed to communicate effectively in a general work environment, specifically in the conservation, wildlife and ecotourism industry. Secondly, this module addresses Environmental Education (EE), which focuses on introduction to EE in general, the importance and history of EE, sustainable living and development, trends in EE and student-centred and teacher-centred activities. Thirdly, guiding principles are introduced. This section of the module focuses on providing the student with a deeper conceptual understanding of guiding, focusing on nature-based guiding principles, types of guides, preparation, trails and legal aspects of the guiding trade. (Total notional time: 180 hours)

CONSERVATION COMMUNICATION II (CCO107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

The purpose of this module is to enable the student to resolve problems and introduce change within the practice of communication and to create an awareness of the skills and competencies needed to communicate effectively in a middle management position, specifically in the conservation, wildlife and ecotourism industry. Secondly, this module addresses aspects of Environmental Awareness (EA), and Nature and Humanity, important skills to address topical socio-economic issues in Conservation Management. (Total notional time: 180 hours)

CONSERVATION ECOLOGY I (CEY105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Introduction to the most important ecological principles as they affect the individual organism in the environment as well as the ecological co-actions, which occur within and between populations. This will enable the student to apply these principles as they affect the management of natural resources. (Total notional time: 180 hours)

CONSERVATION ECOLOGY II (CEY206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Introduction to the most important abiotic and biotic components of all regions of the planet. Specific reference to functioning and classification of regional and local savanna and grassland. Further the integration of people to the environment - the rise and history of conservation and South Africa's current conservation estate, role players and international obligations. Finally, the South African model of environmental compliance in development. (Total notional time: 180 hours)

CONSTRUCTION IN LANDSCAPE TECHNOLOGY I (CLY105D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Horticulture)

The landscape construction process. The various stages that a landscape undergoes to be developed from site survey to plan/design implementation. Introduction to construction materials and terminology. Materials used in landscape construction: bricks, paving, timber, steel, aggregates, etc. Functions and application of various construction materials. The role that various construction materials play in a landscape. Introduction to various tools and machinery used in landscape construction. Familiarisation of hand, power tools and machinery and their uses, as well as their operation. Surveying. Equipment and techniques used in surveying. Grading and site drainage. Site grading and drainage, grading slopes and erosion control. (Total notional time: 150 hours)

CONSTRUCTION IN LANDSCAPE TECHNOLOGY II (CLY206D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Horticulture)

Interpreting construction documents. Being able to interpret and understand specifications and construction detail from plans/designs and documents. Construction calculations. Measurement and calculation of material requirements/installations in a landscape from a plan. Costing of construction materials. Development of a Bill of Quantities, which details the cost of a landscape installation. Basic construction techniques. Construction techniques and methods for installation of paving, walling, decking, timber work and stairs/ramps in the landscape. Construction drawings, sections and section-elevations. Construction drawings of all features on a landscape site. CAD. Rendering a design and construction. (Total notional time: 180 hours)

CONSTRUCTION IN LANDSCAPE TECHNOLOGY III (CLY316D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Horticulture)

Irrigation. Materials for irrigation, the design and installation thereof. Site amenities. Working drawings and construction of water features, site furniture, playground equipment, edging, planters and plant protection equipment. Structural design. Design, working drawings and construction of landscape structures. Axonometric, isometric and perspective drawings. 3D rendering of parts of a landscape plan. (Total notional time: 100 hours)

CONSERVATION MANAGEMENT I (CVM108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

The module serves to enable the student to resolve complex problems and introduce practical solutions within the best practice of biological diversity, its maintenance and management. The focus is on international conventions, biological diversity. Biological diversity management in SA, valuing and measuring biodiversity, assessing and prioritising conservation areas, conservation planning and design of protected areas, key and indicator species, wilderness management, tourism management and urban conservation. (Total notional time: 240 hours)

CONTEMPORARY SPORT ISSUES IV (CSI117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

The student will develop comprehensive knowledge of key issues, which supports the high-performance sports coaching environment. Specifically, the students will be able to outline and appreciate the various contemporary issues in sport in South Africa, African Continent and Internationally: where the practice of sport is viewed as a fair endeavour that incorporates the universal values and principles of: inclusion/representation, egalitarianism, transformation, social cohesion, ethics and ethical considerations, with a broad understanding of society and class. (Total notional time: 60 hours)

CONTINUAL QUALITY IMPROVEMENT (CQI117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Introduction to TQM, Business philosophy, Setting objectives, Business improvement/Waste reduction, Quality Function Deployment, Quality costs-overview, Quality Policy Deployment, Benchmarking, Business requirements, Systems management, and quality improvement. (Total notional time: 120 hours)

CROP PRODUCTION I (CPR115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Crop Sciences)

An introduction to crop production. Factors influencing the adaptability of crops. The principles of different cultivation practices and crop improvement. Calculations regarding planting dates, crop potential, fertilisation, plant population, yields, calibration of implements. (Total notional time: 120 hours)

CROP PROTECTION I (CPT115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Crop Sciences)

Basic entomology: a review of the morphology, development, reproduction, biology and classification of insects and mites, and collection and mounting of insect specimens. Plant pathology: a review of symptoms and the classification of plant diseases, the classification and biology of the different groups of plant pathogens, the disease cycle, the dissemination of plant pathogens. A review of the biology of weeds and methods of weed control: chemical weed control regarding classification, choice and the effectivity of herbicides. (Total notional time: 120 hours)

CROP PROTECTION II (CPT206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Crop Sciences)

Pest control: a review of various pesticides, the use of standard reference material, a review of various pest control methods, the biology and control of known South African agricultural pests. Disease control: a review of different disease management strategies, separation of host and pathogen, cultural control, biological control, physical control, immunisation and resistance, and chemical control, with appropriate examples. Pathogen resistance: mechanisms of resistance and management of resistance. Application: a review of the different types of application equipment and the principles of application, and calibration of application equipment, with appropriate examples. Legislation and the safe use of agrochemicals: discussion of Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) and Hazardous Substances Amendment Act, 1992 (Act No. 53 of 1992) and various other important agricultural laws relating to pest control, a review of the safe use of agrochemicals. (Total notional time: 240 hours)

CROP PROTECTION (CPT107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Crop Sciences)

Sample collection, isolation and purification; Identification of plant pathogens; Control schedule design and technology transfer; Weed identification and control; Insect identification techniques; Insect physiology related to pest control; Agro-chemicals and legislation; Control techniques and related matters. (Total notional time: 240 hours)

CROWN AND BRIDGE (CBR107V) **1 X 3-HOUR PAPER AND PRACTICAL ASSESSMENT**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
Theoretical knowledge and practical skills required for the components of a porcelain bonded crown with reference to sub-structure, porcelain types pertaining to colour, transparency, etc. The qualified student can register with the SADTC as a Dental Technologist entitling him/her to be a laboratory owner, be an employer, and supervise a dental laboratory. (Total notional time: 180 hours)

CYTOLOGY II (CYT206P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to demonstrate the ability to recognise and evaluate cellular morphology of cervical, vaginal, respiratory and urinary cytology and how to apply this knowledge to differentiate between different cells and cellular changes. The student will be able to apply his/her knowledge of cytological techniques to evaluate and identify the cellular changes viewed on the cytological smears. (Total notional time: 180 hours)

D

DAIRY PRODUCTION II (DPA206D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Animal Sciences)
Students will acquire detailed knowledge, skills and applied competencies in areas such as: Dairy cattle industry and Dairy Cattle Improvement Scheme; Major dairy cattle breeds; Dairy cattle breeding plans and genetic evaluation; Anatomy of the mammary glands; Dairy cattle reproduction and selection; Dairy cattle nutrition; Dairy herd management and health; Milk processing and marketing; applicable Acts and regulations; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 240 hours)

DATA ANALYSIS (DTA307P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module teaches the student how to choose the correct statistical method before gathering data. The student will know the correct way to collect the data and how to analyse the data. The proposal is conducted during the year and submitted for ethical clearance. The student will be able to recognise different statistical methods for different type of research. The research process and protocol will be taught to enable the student to become a competent researcher. (Total notional time: 120 hours)

DECENTRALISED WATER AND SANITATION III (DWS117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Environmental, Water and Earth Sciences)
Introduction to decentralised water use, Water supply systems, Sanitation systems and Management aspect of DWSS. (Total notional time: 90 hours)

DENTAL ASSISTING PRACTICAL I (DAP105C) **PRACTICAL EVALUATION**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
General orientation and maintenance of the dental surgery, clinical asepsis, clinical dental disciplines, the processing of X-ray film, the preparation of dental materials. (Total notional time: 210 hours)

DENTAL ASSISTING THEORY: DENTAL ASSISTING I (TDA105C) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
Dental terminology, disinfection and sterilisation, anesthetics, dental disciplines and dental materials. (Total notional time: 120 hours)

DENTAL ASSISTING THEORY: DENTAL RADIOGRAPHY I (TDR105C) **1 X 2-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
Basic principles of X-rays, principles of radiographic examination techniques and preventive methods. (Total notional time: 100 hours)

DENTAL MATERIALS SCIENCE (DMS117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
Theoretical knowledge to understand the physical, mechanical and chemical properties of materials used for advanced dental appliance/prosthesis manufacturing, and is a part requirement to be registered with the SADTC as a Dental Technologist entitling the student to be a laboratory owner, be an employer, and supervise a dental laboratory. (Total notional time: 60 hours)

DENTAL MATERIALS SCIENCE I (DMS105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Dental materials such as gypsum, wax, impression material, acrylics and abrasive and polishing agents. Basic chemistry and physics applicable to dental materials. (Total notional time: 120 hours)

DENTAL MATERIALS SCIENCE II (DMS206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Dental materials such as inlay material. Dental alloys and physical properties of materials. Basic chemistry and physics that apply to dental materials. (Total notional time: 150 hours)

DENTAL MATERIALS SCIENCE III (DME306D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

A continuation of the study of dental materials. Implants, cross-infection and safety in the laboratory. Basic chemistry and physics that apply to dental materials. (Total notional time: 150 hours)

DENTAL PRACTICE MANAGEMENT I (DPM105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Introduction to dentistry, working area, telephone technique, appointments, records and filing, mail, finance and dental stock, human relations, ethics and jurisprudence, introduction to computer literacy. (Total notional time: 210 hours)

DENTAL TECHNOLOGY THEORY I (DET105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Theory of the construction of full dentures. (Total notional time: 120 hours)

DENTAL TECHNOLOGY THEORY II (DET206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Theory of the construction of orthodontic appliances, as well as partial dentures and full metal crowns and bridges, temporary crowns and posts. (Total notional time: 150 hours)

DENTAL TECHNOLOGY THEORY III (DTT306D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Theory of crown and bridge work, including full metal crowns with acrylic veneers and metal constructions for porcelain crowns and bridges. (Total notional time: 150 hours)

DESIGN AND CONSTRUCTION IN LANDSCAPE TECHNOLOGY (DCL107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department Horticulture)

The purpose of this module is to equip the student to have a broader knowledge and understanding of new design related terms and ideas in the environment to achieve and design in a sustainable environmental manner. Various design techniques will be applied to solve various environmental problems and challenges through critical thinking of plant combinations and landscape material combinations. Students will use these acquired competencies addressing various design related challenges and scenarios, including but not limited to sensory educational gardens, healing gardens, sustainable landscape practices, green roofs, habitat development and heritage gardens. (Total notional time: 600 hours)

DESIGN AND CONSTRUCTION IN LANDSCAPE TECHNOLOGY (DCL108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Horticulture)

The purpose of this module is to equip the student with the ability to identify, analyse and transfer (verbally, scientifically and digitally) complex problems in the design and environment related field. The complex problems identified will be solved in a design related manner that is inclusive of construction applications with visual and written presentations. Typical problems that the student will be faced with is the design of open spaces for people with disabilities and/or design urban spaces to decrease the amount of carbon dioxide which could improve socio-economic transformation and increase the economic value for the environment. Students will use all acquired competencies to address these environmental and social challenges. (Total notional time: 90 hours)

DESIGN IN LANDSCAPE TECHNOLOGY I (DLT105D) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Horticulture)
History of garden design. Prehistory, ancient period, medieval period and modern world. Design methodology layout, processes, procedure and development of an outdoor space. Principles and elements of design. Unit, balance, line, rhythm, scale, texture and form. Plan types design discipline. Variety of plans, measuring, placing of structures and planting design. Design styles and themes. Formal and informal. (Total notional time: 150 hours)

DESIGN IN LANDSCAPE TECHNOLOGY II (DLT206D) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Horticulture)
Landscape design. Site analysis, observing elements, topography, environmental conditions, material use. Design development. Zone diagrams - final master plan. Presentation skills. AutoCAD, Microsoft PowerPoint, mood boards, professionalism. Styles and themes. Various styles and themes, elements, plant combinations. Planting plans. Drawing techniques. Bill of quantity. Comprehensive costing of plans, planting design and hard landscape materials. (Total notional time: 240 hours)

DESIGN IN LANDSCAPE TECHNOLOGY III (DLT316D) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Horticulture)
To assess a site on the principles of sustainable landscape design practices. To recommend/propose how to overcome urban challenges. To propose various design applications to solve environmental problems. Sustainable landscape design. Sustainable products, design techniques and plant material. Urban design challenges. Challenges and how to overcome with design application. Solving environmental problems through design application. Using plants and other design applications and combinations to solve problems. (Total notional time: 200 hours)

DIAGNOSTIC LABORATORY MANAGEMENT IV (DLG418P) **1 X 3-HOUR PAPER**
(Module custodian: Directorate of Biomedical Sciences)
This module prepares the student to apply fundamental and specialised knowledge of managing a diagnostic laboratory in the field of medical laboratory science. The student will be able to apply his/her knowledge of general laboratory management, including financial and human resource management. Supported by method evaluation and control of compliance and regulatory matters pertaining to the bio-analytical environment. (Total notional time: 120 hours)

DISASTER AND FIRE DEFENCE PLANNING (DFP118G) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Implement the strategy of the National Disaster Management Framework as an integral part of the National Disaster Management Act. Introduction and background; constitutional, legislative and policy mandates; integrated institutional capacity; risk assessment; disaster risk reduction; preparedness planning; response; recovery and testing and review of the plan. (Total notional time: 180 hours)

DISASTER MANAGEMENT IV (DMA408P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Environmental Health)
The nature of emergencies and disasters; pre-disaster activities; emergency response; recovery and sustainable development; shelter and emergency settlements; water supply; sanitation; food safety; vector and pest control; control of communicable diseases and prevention of epidemics; chemical incidents; radiation emergencies; mortuary service and handling of the dead; health promotion and community participation; human resources. (Total notional time: 160 hours)

E

EARTH AND GENERAL SCIENCE FOR OCCUPATIONAL HEALTH (EGS105C) **1 X 3-HOUR PAPER**
(Module custodian: Department of Environmental, Water and Earth Sciences)
The purpose of this module is to enable the students to gain knowledge and competencies concerning the Earth as a system of interrelating subsystems such as lithosphere, atmosphere, biosphere and hydrosphere. Earth structure, plate tectonics and rock cycle, groundwater dynamics and basics of geohydrology. Prepares the student to demonstrate an understanding of waste pollution dynamics on different spheres. Qualifying students will gain an understanding of the natural interaction, mobility and transportation of waste between the different spheres of the Earth. (Total notional time: 120 hours)

EARTH SCIENCE I (EHS206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module contributes towards understanding of geology, edaphology, soil classification, climatology and cartography as it applies to the ecological management of protected areas and game ranches. Knowledge of areas of specialisation and how that knowledge relates to other fields, such as Edaphology, Geology, and Cartography. (Total notional time: 180 hours)

EARTH SCIENCE I (ESC206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Introduction to the most important geological, edaphological and soil classification methodologies or principles as well as the collection of climatic information and the integration of this data into various maps to be utilise in the development of adaptive managerial plans. Knowledge of areas of specialisation and how that knowledge relates to other fields, such as Edaphology, Geology, and Cartography. (Total notional time:180 hours)

ECOLOGICAL RESTORATION (ECR108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Horticulture)

The purpose of this module is to equip the students with the ability to identify, analyse and transfer (verbally, scientifically and digitally) the complex nature of the importance of ecological restoration in South Africa, Africa and the rest of the globe. It is imperative for a student to understand that ecological restoration is not only limited to South Africa and Africa, but a world-wide concern. The complexity of ecological restoration will be explored where the student will need to formulate a restoration plan based on the environmental and climate change challenges. Students will be exposed to the processes of reconciliation of biodiversity in human-dominated environment. (Total notional time: 300 hours)

ECONOMIC GEOLOGY (ECG206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Principles of ore deposit geology. Kimberlitic diamonds and carbonatites. Magmatic ore deposits. Hydrothermal ore deposits. Pegmatitic ore deposits. Sedimentary Exhalative (SEDEX), Volcanogenic Massive Sulphides (VMS) and Skarn ore deposits. Sedimentary placer deposits. Residual sedimentary deposits. Supergene ore deposits. Plate tectonics and mineral deposits through geological time. Introduction to the stratigraphy of South Africa and its economic orebodies which are hosted within Archaean Intrusions, Pongola Supergroup, Dominion Group and Witwatersrand Supergroup. Ventersdorp Supergroup and the Limpopo Belt. Transvaal Supergroup. Bushveld Igneous Complex and Rooiberg Group. Alkaline Complexes (Phalaborwa, Schiel and Pilanesberg). Soutpansberg, Waterberg Groups and Olifantshoek Supergroup. Namaqua-Natal Province. Cape Granite Suite and Cape Supergroup. Sedimentary and Igneous Karoo. Gondwana Break-up and Mesozoic and Cenozoic deposits (on- and offshore). Impact Structures, Kimberlites, Karsts and caves. (Total notional time: 200 hours)

ECONOMICS OF QUALITY (EQU108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Principles of corporate financial accountability and profit incentive; Cost of quality; Quality cost categories; Performance measures; ISO 100014; Linking performance measures to strategies and objectives; Applying LEAN Six Sigma to reduce PONC; Quality costing of projects; Application of simulation modeling and forecasting; ISO 31000-Risk Management. (Total notional time: 200 hours)

EDUCATION AND MANAGEMENT IN NURSING I (EMN216P) **1 X 2-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

The student will be imparted with knowledge, skills and professional values regarding fundamentals of nursing unit management, philosophy and the general knowledge of the nursing unit and introduction to education and personnel development. Adult learning and the role of the professional nurse as teacher will be applied. Upon completion of this module, the student will be able to understand, apply and analyse the fundamentals of nursing unit management and describe the adult learner in the context of unit management and unit teaching within an ethical and legal framework. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time and 37.5 hours of self-directed learning (including assessment time))

EDUCATION AND MANAGEMENT IN NURSING II (EMN317P) **1 X 2-HOUR PAPER**
(Module custodian: Adelaide Tambo School of Nursing Science)
The student will be equipped with knowledge, skills and professional values regarding Organisation the unit which entails; setting priorities, decision-making, problem-solving and conflict management creating harmony in the unit. Education and personnel development in health focusses on continuous professional development that is methods of education, learning responsibility and principles of learning and teaching to enhance quality nursing care within the legal framework in a unit. Upon completion of this module, the student will be able to use decision-making manage problems such as conflict, and facilitate teamwork in a unit. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time and 37.5 hours of self-directed learning (including assessment time))

EDUCATION AND MANAGEMENT IN NURSING III (EMN418P) **1 X 2-HOUR PAPER**
(Module custodian: Adelaide Tambo School of Nursing Science)
This module prepares the student to execute the four management principles in the nursing unit. Further, this is including directing in the nursing unit, general principles of directing and leadership styles, financial liabilities, risk management in the unit, communication and relations in the unit, introduction of labour relations and retention of personnel and application of management process in the nursing unit. Upon completion of this module, the student will be able to manage a unit within the legal-ethical framework of Nursing. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time, 2 hours of practical and 35.5 hours of self-directed learning (including assessment time))

ELECTRO-ANALYTICAL TECHNIQUES (EED117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemistry)
Principles of electrochemistry, electrogravimetry and coulometry. Electrochemical cells and electrodes for potentiometric determinations. Predict ohmic potential, concentration and kinetic polarisations. Instrumentation and applications. (Total notional time: 120 hours)

ELECTROCHEMISTRY III (ETC316D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemistry)
Introduction to electroanalytical methods. Potentiometry. Conductiometry. Fundamentals and functioning of electrochemical cells. Galvanic and electrolytic cells. Reference and indicator electrodes. (Total notional time: 120 hours)

ELECTROMAGNETISM (ELM117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Vector analysis; electrostatics and magnetostatics; sources of magnetic fields; electrodynamics; Maxwell's equations and applications: Gauss', Ampere's and Faraday's Laws; electromagnetic waves; antennas and radiation; electromagnetic radiation: solar energy. (Total notional time: 120 hours)

ELECTRONICS PRINCIPLES I (ELPH501) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Electronic components, measuring instruments, semi-conductor physics, P-N junction diode, laser diodes, bi-polar junction transistor (BJT), multi-stage amplifiers, field-effect transistor (FET), operational amplifier (Op-Amp), sensors and transducers: temperature measurement. (Total notional time: 100 hours)

EMERGENCY MANAGEMENT I (EMG115D, EMG115U) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Introduction to management: planning, organising and delegating, motivation, control, ethics, corporate social responsibility and corporate governance. Introduction to entrepreneurship: business idea, feasibility studies, setting up a business. (Total notional time: 120 hours)

EMERGENCY MANAGEMENT II (EMG216D, EMG216U) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Communication theory, incident leadership, motivation and self-confidence, team health and safety, conflict management, incident command systems. (Total notional time: 120 hours)

EMERGENCY MANAGEMENT III (EMG316D, EMG316U) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Disaster and emergency management: size up and incident command system (ICS), ICS rightsizing for each event, incident rehabilitation, civil unrest, ICS vehicle fires. (Total notional time: 120 hours)

EMERGENCY MANAGEMENT IV (EMG117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Introduction and unit overview of management theories of employee motivation in Management, motivation processes and application of motivational theories. Contemporary management framework of management practices based on recent trends. Managers and Managing, Leadership vs. Management, Organisational Performance Management, Efficiency and Effectiveness, Levels of Managers, The Roles of Managers and Diversity Management. Disaster Management and the key components of emergency management. Fire Service Operations Incident Command, Fire and Rescue Service Incident Command Doctrine, Organisation on the Incident Ground, Incident Risk Management and Command within the Resilience Framework. (Total notional time: 180 hours)

ENDOCRINOLOGY AND REPRODUCTION (EAR347P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

A study of the pathophysiology of major disorders affecting the endocrine system, coupled with drug treatment of such conditions. This module includes the basic female and male reproduction functions, diseases and conditions that are under hormonal control, including pregnancy, growth development, birth, genetics, lactation and ageing. (Total notional time: 210 hours)

ENGINEERING DRAWING I (ENDH501) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Mechanical and Mechatronics Engineering)

Drawing office practice. Introduction to draughtmanship, projections (orthographic and isometric), intersections of surface, graphic determination of forces in frames, topographical drawing, SBS specification. (Total notional time: 150 hours)

ENGINEERING GEOLOGY I (ENG206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to Engineering geology: Rock Properties, intro to rock mechanics with geological structures, engineering properties of rocks. Laboratory and on-site testing methods for rock and soil, structure of roads, building foundations. Rock in construction. (Total notional time: 200 hours)

ENGINEERING GEOLOGY II (ENG316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Site (ground) investigation such as a dam wall area, pipelines, roads and foundations: investigation process and methods, field work practices, soil profiling, core and chip logging. Soil properties and rock types, soil development through rock cycles and processes and geological structures. (Total notional time: 180 hours)

ENGINEERING GEOLOGY IV (ENG107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Geology and Civil Engineering. Upon successful completion of the module, the student should be able to: determine the impact potential South African problems soils or unstable slopes will have on an engineering geology project. Based on this the student should be able to determine and recommend possible mitigation or remediation options from the ground investigation that needs to be carried out. (Total notional time: 250 hours)

ENGINEERING GEOLOGY V (ENG108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Strengthen the student's engineering geological knowledge through in depth study and research of engineering geological properties across the stratigraphy of South Africa. Different and specific engineering geological properties can then be determined and identified for the different stratigraphies, based on location and rock type, properties such as rock strength, rock durability, possible soil profile development and associated properties, use of rock and soil as a construction material, rock and soil slope stabilities. This module will aid in how different investigation method/s need to be approached e.g. determination of drilling position or requirement of drilling compared to other methods. Shear stress and effective stress in soils. Engineering geology core logging. (Total notional time: 200 hours)

ENTREPRENEURIAL SKILLS (EBT117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Management and Entrepreneurship)

Entrepreneurship and Small-, Medium- and Micro Enterprises (SMMEs) in Perspective; basic business concepts and the Business Environment; the identification of feasible business ideas; the viability of a business idea; the business plan; and setting up a business. (Total notional time: 120 hours)

ENTREPRENEURSHIP I (ENT115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Management and Entrepreneurship)

Students will acquire knowledge, skills and competence in various types of businesses, management functions, budgeting, accounting, administration, banking, personnel management, customer relations and entrepreneurship including drafting a business plan. These skills will assist entrepreneurs in successfully starting and running a business. (Total notional time: 120 hours)

ENVIRONMENTAL BIOLOGY I (EVB115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Terrestrial and aquatic ecosystems. Functioning and importance of ecosystems. Threats to ecosystems. Biomes of South Africa. South Africa's flora. South Africa's fauna. (Total notional time: 60 hours)

ENVIRONMENTAL BIOLOGY II (EVB206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Ecological principles. Organisms and the physical environment. Population ecology. Population's exploitation. Population's restoration and control. Community ecology. (Total notional time: 200 hours)

ENVIRONMENTAL BIOLOGY III (EVB316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Population genetics. Conservation genetics. Local and regional phylogenetics. Evolution. (Total notional time: 150 hours)

ENVIRONMENTAL BIOTECHNOLOGY (EBI117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

This module prepares the student to understand the role of microorganisms and their products in the field of Environmental Biotechnology. It is therefore suitable for continuing specialisation by reiterating the deep and systematic understanding of the role of microorganisms in this setting, their products and how these products can be used to benefit humankind. The content will include (but not limited to): Microorganisms in nature, Biogeochemical cycling, Waste water treatment, Xenobiotic treatment using microorganisms, Bioleaching and Biosorption, Treatment of oil spills, Independence and Reliability, Professionalism (attention to safety principles), To interpret and execute instructions, and Drafting a report. (Total notional time: 120 hours)

ENVIRONMENTAL CHEMISTRY I (EVC216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Chemical fate and transport. Aquatic Chemistry. Oxidation-Reduction in Aquatic Chemistry. Phase Interactions in Aquatic Chemistry. Aquatic Microbial Chemistry. Water Pollution. Water Treatment. Chemical Analysis of Water and Wastewater. (Total notional time: 120 hours)

ENVIRONMENTAL EARTH SCIENCES I (EAG206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Environment and sustainable development. Human population growth. Anthropogenic climate change. Air pollution. Water and land pollution. Environmental pollution law in SA. Geology and biodiversity: changes over Earth's history. Geology and biodiversity: making the links. Habitat fragmentation and habitat loss as an environmental problem. Biodiversity law in SA. Regulating the environmental impacts of prospecting and mining. Environmental management systems. Environmental Impact Assessments. (Total notional time: 120 hours)

ENVIRONMENTAL EARTH SCIENCES II (EAG316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

General Petrology. Pyroclastic Rocks and their Classification. The Contribution of Volcanic eruptions to Atmospheric Chemistry. Thermodynamic equilibria. Mineral speciation. Geochemistry of Continental Solids. Chemistry of Continental Waters. Chemistry of Oceanic Waters. (Total notional time: 120 hours)

ENVIRONMENTAL EARTH STUDIES I (EVE115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Understand how the earth was formed. Know the solar system. Discuss the origin and function of the earth's magnetic field. Understand observations that led to the theory of plate tectonics. Discuss tectonic activities at different plate boundaries and how the impact on the different components of the environment i.e. hydrosphere, lithosphere, biosphere and atmosphere. Relate formation of sedimentary, igneous and metamorphic rocks to the different plate tectonics processes. Identify different minerals in hand specimen. Classify minerals on the basis of their chemistry. Relate chemistry of minerals to the impact they are likely to have on the environment. (Total notional time: 60 hours)

ENVIRONMENTAL EARTH STUDIES II (EVE206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Understand how the earth is layered and how these layers influence the resulting rock. Apply their knowledge of weathering and products in understanding the behaviour of metals in the environment. Determine and monitor the flow of groundwater. Determine the sources of groundwater contamination and put in place mitigation plans. Discuss tectonic activities at different plate boundaries and how the impact on the different components of the environment i.e. hydrosphere, lithosphere, biosphere and atmosphere. Relate formation of sedimentary, igneous and metamorphic rocks to the different plate tectonics processes. Identify different rock samples in hand specimen. Classify rocks on the basis of their mineral composition, fabrics and chemistry. Relate chemistry of minerals to their likely impact on the environment. (Total notional time: 200 hours)

ENVIRONMENTAL EPIDEMIOLOGY III (EEM307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Causation and causal inference in epidemiology; measures of risk/health measurement; epidemiological study designs; summarising and displaying public health data (epidemiological data presentation, analysis, and interpretation); ethics in epidemiology; environmental epidemiology; occupational epidemiology; toxicology and epidemiology; social epidemiology; public health surveillance; epidemiology, health policy and planning; disposal of the dead; and non - communicable disease. (Total notional time: 170 hours)

ENVIRONMENTAL HEALTH MANAGEMENT AND ADMINISTRATION III (EHM307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Introduction to health policy formulation in South Africa; managerial legislation at national, provincial and local government levels; the health system plan of South Africa; stakeholders in the health sector; administrative processes of public administration in practices; office practice management in the workplace; scientific report writing skills in the workplace; project management in the workplace. (Total notional time: 200 hours)

ENVIRONMENTAL LEGAL PRACTICE II (ELP206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Sources and branches of law. The Constitution of South Africa. Basic environmental legal principles in South Africa. Water law in South Africa. Biodiversity law in South Africa. Air pollution management law in South Africa. Laws for EIAs in South Africa. Waste law in South Africa. Law on Rehabilitation and Soils in South Africa. Law on Energy Creation and Use in South Africa. (Total notional time: 200 hours)

ENVIRONMENTAL MANAGEMENT (EVD107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

The application of key terms, rules, theories and techniques of the field of environmental management. Upon completion, the student will be able to recognise and use the major tools used for waste management, environmental rehabilitation and organisational environmental management. In addition, the student will demonstrate his/her writing skills, team working ability and presentation skills. (Total notional time: 240 hours)

ENVIRONMENTAL MANAGEMENT I (EVM115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Air pollution. Climate change. Water pollution. Renewable Energy. Human Population and Impacts on the environment. Sustainable cities. (Total notional time: 60 hours)

ENVIRONMENTAL MANAGEMENT II (EVM206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to Integrated Environmental Management tools. Environmental economics. Voluntary and Mandatory screening. Environmental management systems. Sustainability Reporting. Environmental Auditing. (Total notional time: 200 hours)

ENVIRONMENTAL MANAGEMENT III (EVM316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Define Integrated Environmental Management. Differentiate between Strategic Environmental Assessment and an Environmental Impact Assessment (EIA). Differentiate between a full EIA and Basic assessment process. Demonstrate an ability to compile a Basic Assessment using the provided template. Define Social Impact Assessment. Outline the SIA process and the legal mandate. Discuss the advantages of SIA. Describe the four stages of a Life Cycle Assessment. Discuss the benefits and limitations of LCA. Demonstrate knowledge of relevant terminology for Risk Assessment i.e. risk assessment, risk exposure, hazard. Describe the risk assessment process. Define relevant terminology, i.e. biocapacity, ecological footprint, ecological overshoot. Demonstrate knowledge of calculating ecological footprint. (Total notional time: 150 hours)

ENVIRONMENTAL MANAGEMENT IV (EMA428P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Elements of environmental management. National Environmental Management Act, 1998 (Act No. 107 of 1998). Types of environ-mental resources. Environmental assessment processes including environmental health impact assessments. Environmental evaluation techniques. Environmental management system (ISO 14001: 2004). (Total notional time: 200 hours)

ENVIRONMENTAL POLLUTION: WASTE WATER AND AIR II (EPL206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Definition of waste and its classification; waste generation and composition; waste storage, collection, transportation and disposal; waste reduction and separation; toxic waste, treatment and disposal; management of health care risk waste (infectious waste); water cycle and water sources identification/ mapping; water treatment; different uses of water and institutional responsibilities; sources of pollution, management of waste-water and its impact to health and environment; mining and health; types of sanitation systems used in emergencies, rural and urban communities; water, waste and law; monitoring sanitation and water sources; principles of combustion; atmospheric chemical and physical processes in the atmosphere. (Total notional time: 150 hours)

ENVIRONMENTAL POLLUTION SCIENCE II (EPS206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to air, water and soil pollution. Potable water and wastewater treatment. Introduction to thermal pollution. Introduction to waste management. Introduction to emerging persistent pollutants (EPP). Experimental component: sampling inorganic trace metals from environmental media and determining their concentration. (Total notional time: 200 hours)

ENVIRONMENTAL POLLUTION SCIENCE III (EPS316D) **1 X 3-HOUR PAPER AND PRACTICAL ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Advanced approaches to air, water, noise and soil pollution. Advanced approaches to wastewater treatment technologies. Advanced approaches to waste management. (Total notional time: 150 hours)

ENVIRONMENTAL PRACTICE AND PROFESSIONALISM (WIL THEORY-BASED) (EPP105C) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Students are exposed to Theory and Work-based exposure to different waste facilities. Students will be hosted in different organisations relevant to waste resources and management. Students work under supervision from a workstation at the host employer's office. Responsibility, accountability, punctuality and professional work ethics are mastered in this module. Theoretically, in this module, students will continually contribute to problem-based learning, accountability and leadership qualities. Students will undertake full responsibility for their learning. On completion, the student will be able to practically apply the knowledge and skills impacted on them throughout this programme. (Total notional time: 240 hours)

ENVIRONMENTAL PRACTICES I (EMP105D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Horticulture)

The Ecosystem. Cultural-ecological systems. The soil. The functioning of environmental systems. The environment as a resource. The human influence. Environmental pollution. (Total notional time: 180 hours)

ENVIRONMENTAL PRACTICES II (EMP206D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Horticulture)

Environmental issues and their relevance to South Africa. Urbanisation. Environmental management. Environmental Impact assessment (EIA). Rehabilitation and reclamation. Environmental legislation. (Total notional time: 180 hours)

ENVIRONMENTAL RESEARCH PROJECT (ENR107V, ENR117R) **PROJECT ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

The application of the key terms, rules, theories and techniques of research in the field of environmental science. Upon completion, the student will be able to identify a relevant research topic, write a proposal, conduct research according to sound scientific principles, summarise, interpret and communicate in a scientific way. The content of the module includes, but is not limited to, introduction and identification of research topic, motivation, objectives, experimental design, literature review, data collection, data analysis, interpretation, discussion and conclusions. The module will include finalising a research report. (Total notional time: 480 hours)

ENVIRONMENTAL SCIENCE (EVS107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

The application of key terms, rules, theories and techniques of the field of environmental science. Upon completion, the student will be able to recognise and critically evaluate the major environmental specialist modelling and assessment techniques. In addition, the student will be able to describe and critically evaluate green processes and benign chemical technology, as well as demonstrate his/her writing skills, team working ability and presentation skills. (Total notional time: 240 hours)

ENVIRONMENTAL SCIENCE (ENS108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

This module enables students to produce and source relevant data and information, interpret, present and summarise, proposed and implement sustainable environmental measures and in a scientific way. Communicate scientific principles on various environmental assessment and management topics, including but not limited to the environment, environmental pollutants, and the range of principles and procedures relevant to investigations conducted by environmental chemistry assessors. (Total notional time: 240 hours)

ENVIRONMENTAL SCIENCE AND TECHNOLOGY III (ESY307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Introduction to environmental science; Aquatic Chemistry; Geochemistry; Atmospheric Chemistry; Water Treatment; Toxicological Chemistry; and Industrial Ecology. (Total notional time: 240 hours)

ENVIRONMENTAL SCIENCE PROJECT (NSP108G, NSP118R) **PROJECT ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Upon completion of this module, students will be able to select and apply qualitative and/or quantitative research skills in environmental sciences. This module will provide a learner with sound knowledge on the important factors needed for research planning and processes, experimental design, and different research application techniques and strategies used in practice to solve problems and address industry related situations. (Total notional time: 240 hours)

EQUESTRIAN COACHING AND INSTRUCTION II (ECI216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students will acquire knowledge, skills and applied competencies in areas such as: Teaching and coaching principles and practice for the equestrian; Basic equitation principles and schooling exercises for the equestrian and equine combination; Formulating lesson plans and managing performance programmes; Lunging principles and practice; Specialised instruction and coaching at a fundamental level for purpose; Ethical equitation – human/rider effect on the training and welfare of equines; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 120 hours)

EQUINE APPLIED ZOOTECHNOLOGY II (EZA206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students will acquire knowledge, skills and applied competencies in areas such as: equine morphological assessment and profiling; natural and acquired equine locomotion patterns and gait abnormalities; horse breeds of the world and type classifications; tack and training equipment for a diversity of equestrian and related activities; natural equine behaviour principles and their application in practice; evaluating suitability for function and selecting horses for specific equestrian disciplines; stereotypic coping behaviours and behavioural problems in horses; learning theories and foundational equitation concepts; the equestrian sporting disciplines, management and specialist care of the competition horse; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 240 hours)

EQUINE EXERCISE PHYSIOLOGY II (EEP216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students will acquire knowledge, skills and applied competencies in areas such as: Physiology of equine exercise and training; Equine exercise, training for specific events and designing training and conditioning regimes; Biomechanical and kinesiological aspects of riding and training: The horse's neck, trunk and limbs; Concepts in training and riding associated with balance and posture; Concepts in training associated with equine locomotion, quality of movement and jumping technique; Poor performance in the equine athlete and welfare of the performance horse; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 120 hours)

EQUINE NUTRITION II (EQN216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students will acquire knowledge, skills and applied competencies in areas such: Nutritional physiology and body condition scoring; Determination of requirements for protein, energy, carbohydrates, acid and neutral detergent fibre, vitamins and minerals; Nutrient provision: protein, energy, fibre and raw material processing; Commercial rations/simple ration formulation and calculation; Feeding management responses: rates of passage, glycaemic response, fermentation kinetics; Exercise physiology and feeding strategies for sport horses; Nutritionally induced and metabolic disorders, and nutraceuticals; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 120 hours)

EQUINE VETERINARY CARE II (EVA206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students will acquire knowledge, skills and applied competencies in areas such as: recognising emergencies requiring the immediate attendance by a veterinarian; taking necessary first-aid steps until the vet arrives; identifying and understanding minor conditions which can be treated by the well-trained student him/herself; recognising common ailments of each of the biological systems of the horse; and how that knowledge relates to other fields, disciplines or practices. The module will provide the theoretical knowledge and the practical training to assist and communicate with the veterinarian during examination and treatment of the sick horse. (Total notional time: 240 hours)

EQUIPMENT AND SAFETY I (ESA115C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

This module prepares the student to apply knowledge and skills about water treatment equipment in the distribution system, wastewater treatment and wastewater collection systems, and for the production of safe drinking water. The student will be able to apply his/her knowledge of equipment used in the various unit processes to produce effluents of the required quality sustainably and to operate a treatment plant safely. Upon completion of the module, the student will be able to operate and maintain pumps, pipes, valves, instruments and processes equipment safely. (Total notional time: 180 hours)

EXERCISE ANATOMY AND PHYSIOLOGY I (EXE206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

A module aimed at introducing a student to the scientific basis of exercise physiology to prevent or control mind-body diseases, promote health and well-being, and enhance athlete performance. In addition, the text enables him/her to understand physiology and athletic performance, by examining exercise metabolism, fuel utilisation, and cardiovascular functions. Specific physiologic calculations are presented to teach the student how to monitor exercise intensity, as well as to improve the safety and credibility of client-specific test protocols, health and fitness training programmes, and athletic competitions. He/she will learn about current research and research practices in muscle and exercise as well as the necessary physiologic, electrocardiographic, and anatomic concepts pertinent to prepare for Exercise Anatomy and Physiology II. (Total notional time: 180 hours)

EXERCISE ANATOMY AND PHYSIOLOGY II (EXE306D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module enables students to apply their knowledge to demonstrate an understanding of the acute and chronic physiological responses to exercise, as well as the physiological basis of exercise performance. It examines the metabolic supply of energy to exercising muscle; the acute responses of the cardiovascular, respiratory, thermoregulatory, neural, endocrine and muscular systems to exercise; and the chronic physiological responses to exercise training. In addition, it focuses on exercise related age and sex consideration and cardiovascular disease, obesity and diabetes in relation to physical activity. (Total notional time: 180 hours)

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FARRIERY II (FAR216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students are capacitated with detailed knowledge of horse husbandry principles and practice specific to the field of equine hoof care and principles of horseshoeing. Students will acquire knowledge, skills and applied competencies in areas such as: The history of horseshoeing and the evolution of modern farriery practices; Anatomy and physiology of the distal equine fore- and hind limb; Pathology of the equine foot; Farriery tools, equipment and horseshoeing accessories; Types of horseshoes, shoe-making and styles of horseshoeing; The practice of trimming and the principles of horseshoeing; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 120 hours)

FIELD CROPS II (FLC206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Crop Sciences)

Introduction to the industry of field crops. Cultural practices. Climatic requirements of field crops. Alternative field crops. Classification of field crops. Harvesting of field crops. Yield, quality and its maintenance. Sunflower production. Soya bean production. Potato production. Lucerne production. (Total notional time: 210 hours)

FINANCIAL MANAGEMENT I (FNC107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module covers the field of financial management as applicable to the conservation industry. It serves to enable the student to resolve problems and introduce change within the field of financial management and various aspects of finance related to wildlife management and marketing, specifically in the conservation, wildlife and ecotourism industry. This module aims to develop important skills to address topical socio-economic issues in Conservation Management. (Total notional time: 180 hours)

FINANCIAL MANAGEMENT II (FMG117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Public Sector Finance)

Environment for Managerial Finance; Time Value of Money; Risk and Return; Financial Statements and Analysis; Capital Budgeting and Cash Flows; Working Capital and Current Asset Management as well as Cost-Volume-Profit (CVP) Analysis. (Total notional time: 180 hours)

FIRE CHEMISTRY II (FCH216D, FCH216U) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Chemical hazardous materials, principles of chemical reactions, hazardous materials regulations, chemistry of common elements. (Total notional time: 120 hours)

FIRE CHEMISTRY III (FCH316D, FCH316U) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Corrosive materials, water reactive materials, toxic substances, oxidisers. (Total notional time: 150 hours)

FIRE CHEMISTRY IV (FCH117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Flammable gases and flammable liquids; Hazardous simple organic materials; Hazardous complex organic compounds; and Polymeric materials. (Total notional time: 240 hours)

FIRE HYDRAULICS II (FHY216D, FHY216U) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Fluid properties, pressure in fluids, hydrostatic forces, buoyancy, fluid flow, Bernoulli's equation. (Total notional time: 180 hours)

FIRE HYDRAULICS III (FHY316D, FHY316U) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Fluid flow types, control fluid volume principles and applications, conservation of mass flow and energy, application of extended Bernoulli's equation and draining of tanks, hydraulic power, fluid pumps. (Total notional time: 150 hours)

FIRE HYDRAULICS IV (FHY108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Applied concepts in fluid mechanics principles in water management in extinguishing fire outbreaks; basic fluid mechanics in four topical areas: canonical flows, multiphysics coupling, fluid mechanical measurements in fires, and numerical simulation of fires. Dimensional analysis; reynolds transport theorem; hydraulics principles; bernoullis equation; rotational and irrotational flow; pressures in fluids; fundamentals of fluid flow; potential flows and mass, momentum and energy. (Total notional time: 180 hours)

FIRE MANAGEMENT INFORMATION SYSTEMS (FMI118G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Information Technology)

Different information systems from lowest to highest level of management in the organisation and all related processes followed in the organisation. The information age in which you live: changing the face of business; major business initiatives: gaining competitive advantage with it; databases and data warehouses: supporting the analytics-driven organisation; analytics, decision support, and artificial intelligence: brainpower for your business; electronic commerce: strategies for the new economy; systems development: phases, tools, and techniques; systems development: phases, tools, and techniques; infrastructure, cloud computing, metrics, and business continuity planning: building and sustaining the dynamic enterprise; protecting people and information: threats and safeguards and emerging trends and technologies: business, people, and technology tomorrow. (Total notional time: 120 hours)

FIRE PHYSICS II (FPH216D, FPH216U) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Rotational kinematics and dynamics, waves and sound, electric forces and fields, electric circuits, magnetic forces and fields, electromagnetic induction, thermodynamics, nuclear physics. (Total notional time: 180 hours)

FIRE PHYSICS III (FPH316D, FPH316U) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Heat transfer, frames and structures, thermal expansion of materials, strength of materials, diffusion flames and fire plumes, refrigeration, thermodynamics, automatic fire detectors, radioactivity. (Total notional time: 120 hours)

FIRE PHYSICS IV (FPH117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Diffusion flames and fire plumes; Steady burning of liquids; Steady burning of solids; Ignition: the initiation of flaming combustion; Spread of flame; Spontaneous ignition within solids and smoldering combustion; The pre-flashover compartment fire; The post-flashover compartment fire; and The production and movement of smoke. (Total notional time: 240 hours)

FIRE SERVICE LEGISLATION (FSL118G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Apply law on complex issues pertaining to the fire department in the pursued of work towards the attainment of strategic goals. Introduction to law; introduction to criminal and civil law the court systems in South Africa; law of delict; the South African constitution; Labour Relations Act, 1995 (Act No. 66 of 1995); Rationalisation of Local Government Affairs Act, 1998 (Act No. 10 of 1998); Fire Brigade Services Act, 1987 (Act No. 99 1987); Criminal Procedure Act, 1997 (Act No. 51 of 1997) and Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). (Total notional time: 120 hours)

FIRE TECHNOLOGY I (FTE115D, FTE115U) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Overview of the firefighting career in South Africa, fire appliance maintenance, dash warning lights, vehicle systems, turntable ladder, dust explosion, ventilation, wildland firefighting, marine firefighting. (Total notional time: 120 hours)

FIRE TECHNOLOGY II (FTE216D, FTE216U) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Overview of the aviation environment, general aviation, airport environment, communication, aircraft familiarisation, emergency planning, general aviation incidents, incidents on and off airport property, training and incident management. (Total notional time: 180 hours)

FIRE TECHNOLOGY III (FTE316D, FTE316U) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Fire behaviour, fire extinguishment, safety on fire ground, incident command system (ICS), pre-fire planning, high rise building fires, occupational health and safety, fire department communication, managing customer service, overview of disaster management. (Total notional time: 240 hours)

FIRE TECHNOLOGY IV (FTE117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Introduction to fire origin and cause provides an introduction in fire origin and cause determination. Fire behaviour; Determining the area of fire origin. Determining and classifying the cause of fires and explosions; Fire setters; and Preserving physical scene evidence. The purpose of this module is to provide a guide for emergency response personnel (ERP) who are charged with trying to determine the origin and cause of a fire. Fire origin and cause is designed to train fire officers beyond the certification level and make them better qualified. The module addresses key sections of NFPA® 1001 (2013 edition) and NFPA® 1021 (2009 edition) that focus on a fire service responder's responsibility to begin the process of fire investigation. (Total notional time: 180 hours)

FOOD ANALYSES (FOA108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biotechnology and Food Technology)

This module prepares the student to function effectively in a scientific environment and apply the key terms, and techniques in the field of applied Food Technology. Upon completion, the student will be able to identify, describe and apply various analytical methods for food and chemical analysis including but not limited to: Methods for determination of the proximate composition of foods; Enzymatic; Rheological; Chromatographic; Spectroscopy; Spectrometric; Microscopy and molecular biological methods (theoretical and practical components). Scientific report writing, presentation and other forms of communication skills will be demonstrated. (Total notional time: 360 hours)

FOOD AND MEAT HYGIENE II (FMH206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Introduction to food and meat hygiene; food premises design and layout; good hygiene and manufacturing practices; abattoir design and slaughter of animals; slaughter animal anatomy and physiology; meat inspection. Food premises include formal and informal small, medium and large food establishments/premises e.g. restaurants, food factories, premises used for school feeding schemes, prisons, airports, health establishments; support services, e.g. distribution (transport) and storage. (Total notional time: 210 hours)

FOOD CHEMISTRY II (FCM216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

Study of the major chemical components of food, the chemical changes they undergo during processing and storage and methods used to analyse them. Major chemical components include: sugars, polysaccharides, lipids, proteins, colours, flavours, and water. Laboratory safety and rules. Guidelines for practical report writing. (Total notional time: 120 hours)

FOOD COMPONENTS (FOO107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

Starch and modified starch; hydrocolloids; dietary fibre; sweeteners and bulking agents; acidulants and buffers; antioxidants; preservatives; flavours and colours; enzymes; and emulsifiers. (Total notional time: 240 hours)

FOOD INDUSTRY MANAGEMENT I (FIM316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Management and Entrepreneurship)

Introduction to business and its challenges. The business environment. The task of management. Operations management. Logistics management. Financial management. Human resources management. Marketing management. Entrepreneurship. The business plan. (Total notional time: 120 hours)

FOOD MICROBIOLOGY III (FOM316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

Importance of food microbiology, microbial and mycological spoilage of food, factors influencing microbial spoilage of foods will covered including: microbial growth, survival and death. Spores and their significance. Detection and enumeration of microbes in food. Indicator microorganisms and microbiological criteria. Gram negative foodborne pathogenic bacteria. Gram positive foodborne pathogenic bacteria and other detrimental organisms associated with food. Microorganisms used in fermented foods. Spoilage organisms. Mould. Chemical preservatives. (Total notional time: 150 hours)

FOOD PROCESS ENGINEERING I (FPE316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

Units, dimensions and definitions. Material balances. Energy and Energy balances. Steam and Steam tables. Psychrometrics. Fluid flow and properties. (Total notional time: 120 hours)

FOOD PROCESSING AND SAFETY III (FPS307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Food security and Nutrition. Quality factors of food and changes in food. Food-borne illnesses and outbreak investigation. Preparation/processing and preservation of food. Assessment of food for suitability, for human consumption. (Total notional time: 220 hours)

FOOD PRODUCT DEVELOPMENT I (FPD206D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biotechnology and Food Technology)

Introduction to and development of new food products. Phases in new food product development: Defining objectives and perceived need of the market. Idea generation and screening of the ideas. The development process. Ingredient and product formulations. Nutritional composition of food. Product costing. Product labelling. Analytical techniques for safety and quality evaluation. Food product development project. (Total notional time: 240 hours)

FOOD PROJECTS AND RISK MANAGEMENT (FPR117V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biotechnology and Food Technology)

Project life cycle (stages in project management); resources and resource management; and risk management. (Total notional time: 180 hours)

FOOD QUALITY ASSURANCE I (FQA316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

Introduction to food quality assurance. Quality concepts and terminology. Defining food quality. Customer requirements. Customer feedback and service. Product specifications. Food labelling and shelf life. Good Manufacturing Practices (GMP). HACCP and microbiological control. Managing the organisation. ISO 9000 and ISO 14001. Verification and plant inspection. Continuous improvement. (Total notional time: 150 hours)

FOOD SAFETY ASSURANCE (FSA117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

Food safety assurance in a global context; biological, chemical and physical hazards associated with food; designing safety into a food product; risk associated with hazards and risk analyses; pre-requisite programmes for a food processing environment; hazard analysis and critical control points; and food defence. (Total notional time: 180 hours)

FOOD SAFETY MANAGEMENT IV (FSM408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental Health)

Requirements of a Food Safety Management System (FSMS); documentation of a Food Safety Management System (FSMS); identification of food safety hazards and hazard analysis; auditing techniques and auditing of food safety management systems; reporting on the outcomes of auditing Food Safety Management Systems. (Total notional time: 150 hours)

FOOD TECHNOLOGY COMMODITIES II (FTC206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

The nutritional composition and processing of major food commodities, including: Milk and milk products. Meat, fish, poultry and eggs. Fats, oils and related products. Beverages. Confectionery and chocolate products. Cereal, grains, legumes and oilseeds. Vegetables and fruits. In addition, the principles of food packaging and sensory evaluation principles and techniques will be covered. The use of selected unit operations to prepare different foods will be demonstrated and communicated in the form of group work, presentations and/or scientific reports. (Total notional time: 240 hours)

FOOD TECHNOLOGY PRESERVATION I (FTP115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

Introduction to Food Science and Technology as a discipline. Characteristics of the Food Industry. Constituents of Foods: Properties and Significance. Nutritive Aspects of Food Constituents. Unit Operations in Food Processing. Quality Factors in Foods. Food Deterioration and its Control. Heat Preservation and Processing. Cold Preservation and Processing. Food Dehydration and Concentration. Fermentations and other Uses of Microorganisms. Report Writing and Scientific Referencing. Metric system and formulations conversions. (Total notional time: 120 hours)

FOUNDATION LIFE SKILLS (FLF125P) **CONTINUOUS ASSESSMENT**

(Module custodian: Directorate of Student Development and Support)

Personal, socio-emotional and academic skills development for students in higher education. This module includes 1. Intra- and interpersonal skills (e.g. emotional intelligence, relationships, and conflict management); 2. General study skills (e.g. time management, goal setting, learning styles); 3. Health and wellness (e.g. HIV/AIDS, GBV issues, substance abuse); 4. Student life and adjustment (e.g. identity development, adjusting to a higher education environment); and 5. Financial management. (Total notional time: 20 hours)

FOUNDATIONS OF SPORT COACHING SCIENCE I (FSP105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

A learning module, which will provide the student with a theoretical underpinning knowledge in the field of sport coaching and skill acquisitions. It also offers an introduction to the principles of training, basic coaching methods, safety in sport training and competition, communication skills in coaching, sociology and history of sport coaching, and the South African Coaching Framework. (Total notional time: 200 hours)

FORENSIC RADIOGRAPHY (FRG408P) **1 X 3-HOUR PAPER**

(Module custodian: Directorate of Biomedical Sciences)

The module prepares the student to acquire, apply, integrate and demonstrate in-depth forefront knowledge, principles and clinical practice of forensic radiography. The student will become a diagnostic radiographer, knowledgeable in the field of forensic radiography, who is able to work in a multi-disciplinary health environment. The student will be able to apply his/her integrated knowledge of forensics; applications of radiography in forensics; forensic application on individuals, as well as general forensic protocols and procedures. (Total notional time: 120 hours)

FROM ATOMS TO MOLECULES (ATM145P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

Drug entities of synthetic organic/inorganic nature: structure, reactivity, bonding, acid/base characteristics, configuration and conformation, periodic table, redox reactions, salt formation, pH, pKa, limit tests, physical phases. Analytical methods. (Total notional time: 150 hours)

FROM MOLECULES TO MEDICINES (MTM145P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

An overview of the design and development of pharmaceutical products. Research and development of drug delivery systems, chemistry of medicinal compounds – introductory organic chemistry, the reactions that drug compounds undergo, physical and chemical properties of drugs and how these affect formulation, isolation/synthesis of active ingredients, pre-formulation, formulation, basic principles underlying the development of drug delivery systems, the various drug delivery systems, stability aspects, an introduction to preclinical and clinical trials, compounding of medicines. (Total notional time: 210 hours)

FRUIT AND VEGETABLE CROPS (FVC107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Crop Sciences)

Introduction to fruit and vegetable industries; Classification of fruit and vegetable crops; Identification and use of cultural practices; Alternative production systems; Studies of fruit and vegetable crop botany and ecology; Propagation and management of selected fruit and vegetable crops; Harvesting, packaging, storage and marketing. (Total notional time: 240 hours)

FRUIT PRODUCTION II (FRP206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Crop Sciences)

An introduction to the South African fruit industry and the classification of the fruit. Important climatic factors for fruit production. Establishment and maintenance of the orchard. Structure growth development and production of tree fruit, maturity indices for harvesting, basics of harvesting, field handling and determining the fruit quality parameters with an emphasis of popular temperate fruit. (Total notional time: 210 hours)

G

GENERAL ANATOMY I (GA1115P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module equips the student with introductory human anatomy knowledge. The student will be able to apply his/her knowledge of cellular components, tissues, osteology, joints and various organ systems in theoretical and practical contexts contributing to the body of knowledge necessary in the medical community. Upon completion of the module, the student will be able to identify, explain and apply concepts and principles of cellular form, bones, muscles, and nerves and have a sound knowledge basis of certain organ systems. Students will also have the practical skills to be confident in human body structures and their location. (Total notional time: 120 hours, consisting of 45 hours of instructional time, 18 hours of practical and 57 hours of self-directed learning (including assessment time))

GENERAL ANATOMY II (GA2116P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to enter the medical profession with sound human anatomy knowledge. The student will be equipped with knowledge of various organ systems, sensory organs and embryology anatomy contributing to their understanding of the anatomy of a healthy human body. Upon completion of the module, the student will be able to identify, explain and apply concepts and principles of organ systems, sensory organs and embryology anatomy to the extent that they are able to successfully undertake various discipline specific modules related to human anatomy. Students will also have the practical skills to be confident in all human body structures and their location. (Total notional time: 120 hours, consisting of 45 hours of instructional time, 12 hours of practical and 63 hours of self-directed learning (including assessment time))

GENERAL CHEMISTRY I (GCH105D, GCH105U) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

The role and importance of chemistry in everyday life. Classification and properties of matter. Units of measurement. Atoms, molecules and ions. The modern view of atomic structure and the use of electron configurations in chemical bonding. The periodic table of elements. The use of IUPAC rules for naming inorganic compounds. Application of the mole concept in stoichiometric calculations. Reactions in aqueous solutions. Chemical equilibrium. Fundamental concepts in electrochemistry. Organic nomenclature. (Total notional time: 240 hours)

GENERAL CHEMISTRY IA (GLCH500) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Fundamental concepts of matter and scientific measurements, mass relationships in chemical reaction, reactions in aqueous solutions, electronic structure of atoms, basic concepts in chemical bonding, principles of chemical equilibrium, acids and base equilibria, solubility equilibria, oxidation-reduction reactions, electrochemical cells, chemistry of carbon, classification of hydrocarbons, nomenclature of hydrocarbons. Chemistry practical based on theory with emphasis on basic laboratory techniques. (Total notional time: 270 hours)

GENERAL MATHEMATICS I (GMA105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Do numerical computations. Apply knowledge of mensuration to calculate perimeters, areas and volumes of two- and three-dimensional objects. Apply knowledge of functions and equations to solve well-defined problems. Use basic calculus rules to solve well-defined problems. Use Excel to organise given data in charts and calculate descriptive measures. Do basic regression analysis and curve fitting using Excel and a scientific calculator; and Implement basic probability theories to predict outcomes of events. (Total notional time: 240 hours)

GENERAL MICROBIOLOGY (GMB115P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

This module provides students with introductory general microbiology knowledge. The purpose of the module is to enable students to understand the general microbiology concepts relevant to the field of study; to equip the students with knowledge on the diversity of microorganisms in terms of their basic morphology and behaviour as they interact with the components of their habitats; to enable students to understand the importance of prevention of hazards leading to infectious diseases and the control and basic treatment thereof. (Total notional time: 60 hours, consisting of 37.5 hours of instructional time, 10 hours of practical and 12.5 hours of self-directed learning (including assessment time))

GENERAL MICROBIOLOGY I (GMI306D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

An area of study which focuses on the scientific study of unicellular organisms and colonies, and subcellular genetic matter and their ecological interactions with human beings and other life. Includes instruction in microbial genetics, cell biology, cell physiology, virology, pathogenic microbiology, environmental microbiology, immunology, biostatistics, bioinformatics, and laboratory methods including microscopy. (Total notional time: 120 hours)

GENERAL PHARMACOLOGY (GPA306D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Pharmaceutical Sciences)

Acquire detailed knowledge and understanding of the basic principles of pharmacology, common organ system conditions and their treatment, transdermal delivery and drugs used to treat common skin conditions. (Total notional time: 120 hours)

GENERAL PHYSICS I (GPH105D, GPH105U) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Basic mathematical concepts for physics and measurements. Motion in one dimension. Motion in a plane (projectile motion). Forces and Newton's Law of Motion. Equilibrium condition and torque. Work, energy and power. Linear momentum and impulse. Properties of static and dynamic fluids. Temperature and heat. Heat transfer. General properties of waves. Reflection. Refraction. Electrostatics. Electric circuits. Basic nuclear physics. (Total notional time: 240 hours)

GENERAL PHYSICS IA (GLPH500) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Basic mathematics for physics. Introduction to calculus-based physics. Measurements. Kinematics in 1D and 2D. Newton's laws of motion. Dynamics of uniform circular motion. Work energy and power. Impulse and momentum. Rotational kinematics and dynamics. Fluids, temperature and heat. The ideal gas law and kinetic theory. Electric forces and fields. Electric potential energy and the electric potential. Electric circuits. Reflection of light: mirrors, lenses and optical instruments. Practical experiments related to the theory with emphasis on measuring physical quantities. (Total notional time: 270 hours)

GENERAL PHYSIOLOGY I (GPY115P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module provides the student with introductory human physiology knowledge. The student will be able to apply his/her knowledge of physiology terminology, cytology (including membrane transport mechanisms, cell cycles etc.), and the functioning of body systems such as the skeletal-, cardiac-, endocrine-, and nervous system, in theoretical and practical contexts contributing to the body of knowledge necessary in the medical community. Upon completion of the module, the student will be able to identify, explain and apply concepts and processes related to physiology, their control and regulation such as homeostasis, nutrition, movement and reproduction and distinguish between mechanical, biochemical and physical functions in a living system and how each system integrates with other systems in the human body. Students will also have the practical skills to be confident in all human body functions and their roles. (Total notional time: 120 hours, consisting of 45 hours of instructional time, 9 hours of practical and 66 hours of self-directed learning (including assessment time))

GENERAL PHYSIOLOGY II (GPY216P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to enter the medical profession with sound human physiology knowledge. The student will be equipped with knowledge of biochemistry, embryology, sensory organs and the pathophysiology of organ systems contributing to their understanding of the anatomy of a healthy human body. Upon completion of the module, the student will be able to identify, explain and apply concepts and principles of biochemistry, pathophysiology of organ systems, sensory organs and embryology physiology to the extent that they are able to successfully undertake various discipline specific modules related to human physiology. Students will also have the practical skills to be confident in all human body functions and their roles. (Total notional time: 120 hours, consisting of 45 hours of instructional time, 9 hours of practical and 66 hours of self-directed learning (including assessment time))

GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING (GIS316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to GIS. Spatial data models. Spatial data structures. Spatial data input. Visualisation and query of spatial data. Spatial data transformations. Tools for map analysis: Single map. Tools for map analysis: Map pairs. Tools for map analysis: Multiple maps. (Total notional time: 120 hours)

GEOGRAPHICAL INFORMATION SYSTEMS (GIS) (GIN108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Upon completion of this module, students will be able to source relevant information, summarise, interpret, apply and in a scientific way communicate scientific principles on various topics relevant to geographic information systems, including but not limited to spatial concepts and linkages between different man-made and natural systems. (Total notional time: 180 hours)

GEOGRAPHIC INFORMATION SYSTEM I (GIW117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to GIS, data management and processing systems, data input and preparation, coordinate systems, map projections and Spatial data models. (Total notional time: 120 hours)

GEOLOGICAL MAPS I (GMG115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to map work. Map scales. Topographic profiles. Geological Sections. Geological Traverse and mapping. (Total notional time: 60 hours)

GEOLOGICAL MAPS II (GMG216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to map work. Map scales. Topographic profiles. Geological Sections. Geological Traverse and mapping. Drilling methods. Introduction to structure contours. True dip of a plane, strike of a plane and apparent dip of a plane. Geological sections. Vertical thickness and true thickness. Geological Structures. Three-point problems. (Total notional time: 120 hours)

GEOLOGY I (GEO115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Solar system, gravity and the earth. Continental drift theory. Structure of the earth. Divergent plate boundaries. Convergent plate boundaries. Transform plate boundary. Definition of a mineral and chemical properties of minerals. Mineral habit and crystal forms of minerals. The six mineral crystallographic axes. Physical properties of minerals. Identifying minerals in hand specimen. (Total notional time: 60 hours)

GEOPHYSICS I (GEP216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to Geophysics. Physical properties. Introduction to Geophysical methods. Gravity method. Magnetic method. (Total notional time: 200 hours)

GEOPHYSICS II (GEP316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Application of resistivity into the resistivity method and data acquisition using a resistivity survey. Application of seismic velocity into the refraction seismic method and data acquisition using a refraction seismic survey. (Total notional time: 180 hours)

GEOPHYSICS IV (GEP107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Geophysical properties of rocks such as resistivity, magnetics, gravity, seismic and induced polarisation useful for hydrological exploration and mineral exploration. Upon completion, the student should be able to use geophysics principles to explore for mineral resources and ground water, conduct on site geophysical programs as a geotechnician. (Total notional time: 250 hours)

GEOPHYSICS V (GEP108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Design of detailed geophysical surveys. Data processing using complex algorithms and software to produce maps. Radiometrics. Borehole loggers. (Total notional time: 200 hours)

H

HEALTH CARE ADMINISTRATION AND MANAGEMENT I (HAM107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Management and Entrepreneurship)

Management of a healthcare organisation; Strategic management of a healthcare organisation; Selected management models and theories; Dimensions functional management in healthcare organisations; Nature and scope of human resource management; Planning and provision of human resources; Maintenance of human resources; Utilisation of human resources; and Performance management and development of human resources. (Total notional time: 120 hours)

HEALTH CARE ADMINISTRATION MANAGEMENT II (HAM108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Management and Entrepreneurship)

The student will be able to demonstrate forefront knowledge and the application of strategic management processes, different management models, importance and utilisation of human resources within a health care environment: different models of business functions within a health care environment; risk and quality improvements within a health care environment; methods and strategies to improve the labour related issues within a health care environment. (Total notional time: 120 hours)

HEALTH CARE ADMINISTRATION AND MANAGEMENT I (HAM307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Management and Entrepreneurship)

The student will be able to demonstrate integrated knowledge and the application of strategic management processes, different management models, importance and utilisation of human resources within a health care environment. This module prepares the student to enter the medical profession. (Total notional time: 120 hours)

HEALTH CARE ADMINISTRATION AND MANAGEMENT II (HAM408P) CONTINUOUS ASSESSMENT
(Module custodian: Department of Management and Entrepreneurship)
This module provides the student with the theoretical underpinnings of the field of health-care administration and management; and to provide guidance on governing and managing within a business. Furthermore, this module will assist in developing the skills necessary to make administrative and management decisions and to manage the myriad of managerial dilemmas faced by managers. (Total notional time: 120 hours)

HEALTH CARE ADMINISTRATION AND MANAGEMENT II (HCM108G) CONTINUOUS ASSESSMENT
(Module custodian: Department of Management and Entrepreneurship)
Change Management in a Healthcare Organisation; Communication Management in a Healthcare Organisation; Marketing of a Healthcare Organisation; Healthcare Service Planning and commissioning; Management of HIV and AIDS; Fair Labour Practice; Leadership in Healthcare Service Management; Financial Management of a Healthcare Organisation; Risk Management in a Healthcare Organisation; Quality Improvement models in a Healthcare Organisation; and Continuous Quality Improvements in a Healthcare Organisation. (Total notional time: 240 hours)

HEALTH ECONOMICS (HEC108G) CONTINUOUS ASSESSMENT
(Module custodian: Department of Pharmaceutical Sciences)
This module contributes to an the integral area of pharmacoeconomics, management of pharmacy services, outcomes research, product planning and reimbursement, cost-benefit analysis and risk management of assessing and providing medicines for use in the market. It covers economics and health economics, the key terms, concepts, facts, principles, rules and theories in pre-clinical research; the concept of a market, supply and demand, efficiencies of markets for medicine use; cost terms in economic evaluations and pharmacoeconomic evaluation of medicines and medical treatment; and different methodologies used in evaluating medicine use outcomes. (Total notional time: 120 hours)

HEALTH INFORMATION MANAGEMENT II: DATA ANALYSIS (HIM216P) CONTINUOUS ASSESSMENT
(Module custodian: Adelaide Tambo School of Nursing Science)
This module introduces the student to basic principles of Health Information Management. The student will be able to apply his/her knowledge about health information management systems to ensure effective, legal and ethical record keeping. Upon completion of this module, the student will be able to understand, apply, analyse and audit records, documents and processes as integral part of health information management. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time and 37.5 hours of self-directed learning (including assessment time))

HEALTH INFORMATION MANAGEMENT III (HIM317P) CONTINUOUS ASSESSMENT
(Module custodian: Adelaide Tambo School of Nursing Science)
This module prepares the student to apply knowledge of health information management to ensure effective business management and promote health. The student is also introduced to the e-Health strategy of South Africa. Upon completion of this module, the student will be able to understand, apply, analyse and execute health information management strategies to ensure health promotion and business efficiency. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time and 37.5 hours of self-directed learning (including assessment time))

HEALTH INFORMATION MANAGEMENT IV (HIM418P) CONTINUOUS ASSESSMENT
(Module custodian: Adelaide Tambo School of Nursing Science)
This module prepares the student to promote health through community involvement by information sharing and collaboration on an ongoing basis. Upon completion of this module, the student will be able to understand, apply, analyse and execute the principles of community assessment, engagement and development and health information management to promote community involvement in health care. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time and 37.5 hours of self-directed learning (including assessment time))

HAEMATOLOGY II (HTY206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to apply fundamental and specialised knowledge of Haematology in the field of medical laboratory science. The student will be able to apply his/her knowledge of normal and diseased erythrocytes, leucocytes and haemostasis as well as the analytical techniques to determine these parameters to the field of medical laboratory science. The student should also be able to identify and solve some clinical and diagnostic problems. (Total notional time: 240 hours)

HAEMATOLOGY III (HTY317P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to apply fundamental and specialised knowledge of Haematology in the field of medical laboratory science. The student will be able to apply his/her knowledge of diseased leucocytes and abnormal haemostasis as well as the analytical techniques to determine these parameters to the field of medical laboratory science. The student should also be able to identify and solve clinical and diagnostic problems. (Total notional time: 120 hours)

HISTOLOGY II (HST216P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module introduces the student to the fundamental safety practices and instrumentation used in the routine histology laboratory and provides knowledge and skills in histological techniques of tissue collection, accessing, grossing, decalcification, fixation, processing, embedding, microtomy, staining and mounting. The student will be able to apply his/her knowledge of histological techniques to process samples until obtaining stained microscope slides for diagnostic purposes (Total notional time: 120 hours)

HOLISTIC AND COMPLEMENTARY THERAPY I (HCT105D) **1 X 3-HOUR PAPER AND PRACTICAL EXAMINATION**

(Module custodian: Department of Pharmaceutical Sciences)

Application of somatic skills and competencies to conduct an analysis of the body, face and general health and perform the appropriate somatic treatments. Applying somatic treatments in health and wellness, body therapies and dermal therapies. Skills to incorporate hygienic practices, relevant professional products, adequate home-care, nutritional and lifestyle guidelines to restore and maintain health. (Total notional time: 240 hours)

HOLISTIC AND COMPLEMENTARY THERAPY II (HCT206D) **1 X 3-HOUR PAPER AND PRACTICAL EXAMINATION**

(Module custodian: Department of Pharmaceutical Sciences)

Application of skills and competencies in somatic treatments such as holistic health management, advanced body therapies and advanced dermal therapies. Applying knowledge in somatic treatments relating to a multidisciplinary, holistic approach working alongside other health care providers to restore and maintain health. Identifying integrative and medical treatment options available for somatic conditions that affect physical health, apply electrotherapy aimed at weight management, provide lifestyle advice and home care support. Performing advanced cosmeceutical dermal treatments to improve skin disorders/conditions and perform level 1 cosmetic micro-pigment implantation. (Total notional time: 240 hours)

HOLISTIC AND COMPLEMENTARY THERAPY III (HCT306D) **1 X 3-HOUR PAPER AND PRACTICAL EXAMINATION**

(Module custodian: Department of Pharmaceutical Sciences)

Recognise and identify physical and emotional conditions suitable for holistic, preventative and remedial therapy and understand the use of holistic and complementary therapy in health. Knowledge in health and wellness such as complementary medicine, complementary medicine techniques and cosmetic micro-pigment implantation. Basic knowledge in stress and distress and therapies and techniques to promote relaxation in order to maintain health, wellbeing and lead a productive lifestyle. Apply different relaxation techniques and perform cosmetic micro-pigment implantation on the eyes and lips. (Total notional time: 150 hours)

HOLISTIC AND COMPLEMENTARY THERAPY IV (HCT107V) **1 X 3-HOUR PAPER AND PRACTICAL EXAMINATION**

(Module custodian: Department of Pharmaceutical Sciences)

Stress management strategies and techniques; Relaxation therapies and techniques; and Micropigmentation Implantation Techniques for Reconstructive Purposes. (Total notional time: 300 hours)

HOSPITAL-BASED PHARMACEUTICAL CARE AND FIRST-AID (HPC448P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

The principles and practice of pharmaceutical care in a hospital setting. The module covers the completion of a patient database, identification of patient's drug related needs, construction of a drug related problem list and the development, implementation and evaluation of pharmaceutical care plan. First-aid. Human resource management (Provide well managed human resources in the hospital pharmacy). (Total notional time: 210 hours)

HOSPITAL PHARMACY WORK-BASED LEARNING (HPL448P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

Philosophy of pharmaceutical care, health systems, managing drug supply, administration and management. Treatment plans. (Total notional time: 210 hours)

HORTICULTURAL PRODUCTION MANAGEMENT (HPM107V) **PROJECT ASSESSMENT**

(Module custodian: Department Horticulture)

The purpose of this module is to equip the students with a broader knowledge and understanding of the process of project management and the relevant phases/sequence of related projects in the green industry. Students will use the acquired competencies to address and apply techniques in the execution of horticulture projects to achieve projects in due time, taking into consideration the requirements of the different clients. The application of the correct procedures on the Health and Safety regulations based on green industry projects will be addressed. (Total notional time: 300 hours)

HORTICULTURE AND NURSERY PRACTICE I (HRP105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Horticulture)

Introduction to site planning and nursery design Site selection. Growth Media. Characteristics, Types, Maintenance and care, Soilless growth. Sexual Propagation. Pollination and fertilization, Seed Vegetative propagation. Specialised plant structures and micro propagation. (Total notional time: 300 hours)

HORTICULTURE AND NURSERY PRACTICE II (HRP206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Horticulture)

Propagation and cultivation structures. Types of greenhouse structures, Planning and construction of greenhouses. Greenhouse management. Application of environmental regulation for plant production in the greenhouse environment. Nutrient and water management in a nursery environment. Greenhouse and nursery sanitation. Plant growth manipulation. Plant growth responses. Plant disorders. (Total notional time: 420 hours)

HORTICULTURE AND NURSERY PRACTICE III (HRP316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Horticulture)

Cut flowers. Types of cut flowers (annuals, perennials, geophytes), production requirements; harvesting, handling and post-harvest care; marketing and the cut flower trade. Bedding plants, herbs and medicinal plants. Types of bedding plants, herbs and medicinal plants (including uses), propagation and production requirements, scheduling, hardening, harvesting, processing and post-production care; marketing. Trees and ornamentals. Tree selection, production of trees, site selection and layout; pruning, transplanting and maintenance. Indoor plants. (Total notional time: 300 hours)

HORTICULTURE AND NURSERY PRACTICE MANAGEMENT II (HNP316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Horticulture)

Human resource management. Including labour relations, job descriptions and specifications, human resource planning, personnel motivation, training and development, performance appraisal, remuneration and delegation, communication, labour and relations and supervision and compilation of a basic health and safety file. Contract management. Including definitions, types and importance of contracts, formulation of contracts and contract clauses. Tenders and bill of quantities. Definitions and types of tenders, designing and completing tender documents. (Total notional time: 120 hours)

HORTICULTURE AND NURSERY TECHNOLOGY (HNT107V) **1 X 3-HOUR PAPER**

(Module custodian: Department Horticulture)

This module aims to equip the student with the necessary knowledge and skills to enable them to plan and develop a production system for different horticultural crops. In addition, it will provide the student with the necessary knowledge and skills to critically and practically evaluate plants in terms of their growth and cultivation requirements; identify, apply and recommend techniques for plant growth manipulation and improvement and to identify and solve horticulture production problems in an acceptable and ethical manner and make recommendations for successful production under different growth environments. Upon completion of this module, the student will have acquired knowledge to operate and manage a production system, taking into consideration the current trends in the horticulture industry and requirements of the different markets and be able to contribute towards a socially responsible green industry. (Total notional time: 600 hours)

HORTICULTURE PROJECT (HRD108G, HRD118R) **PROJECT ASSESSMENT**

(Module custodian: Department of Horticulture)

The qualified student will be able to apply qualitative and/or quantitative research skills in horticulture or related industries, with topics and challenges including plant production, growth, nursery management and plant propagation, justifying the objectives and hypothesis of a specific project using ethical principles. This module will provide a student with sound knowledge on the important factors needed for scientific research planning and processes, and different research application techniques and strategies used in practice to solve problems and address industry related situations, analysis and interpretation of research data, in order to make sensible deductions and conclusions in practice to address industry related topics and challenges in the related industries. The acquired skills will be used to present a complete research report and poster. (Total notional time: 420 hours)

HORTICULTURE PROJECT PRINCIPLES (HPP107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department Horticulture)

This module will provide a student with detailed knowledge and skills to apply and evaluate the key concepts, principles and rules of research in horticulture. A student will be able to identify a problem in a work or industry related environment, conduct a literature search and process information to formulate a background and justification, objectives, hypothesis and/or research question related to problem-solving. A student will furthermore, be able to design an experimental layout and/or questionnaire, to address the hypothesis/research question and relevant data collection/sampling methodology according to acceptable ethical research practices and problem-solving principles. The acquired skills will be used to develop a complete research proposal on a selected topic solving specific problems in the horticulture industry and South African community according to sound research principles. Communication skills, reasoning and logical thinking will be developed through oral presentation to peers. (Total notional time: 300 hours)

HUMAN ANATOMY I (HAN105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

The purpose of this module is to equip students with informed understanding of the core areas of the human anatomy system. The student will be able to understand the key terms, concepts, facts, and general principles of human anatomy and be able to apply his/her knowledge of cellular components, tissue and organ systems to and overall perspective of a healthy human necessary in the career focused medical related community. Upon completion of the module, the student will be able to understand important cellular concepts, identify all bones, muscles, nerves and have a sound basis of each organ system. Students will also have mastered limited practical skills in selected human body structures and location. (Total notional time: 180 hours)

HUMAN ANATOMY I (HAN105P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to enter the medical profession. The student will be able to understand and apply his/her knowledge of cellular components, tissue and organ systems, and overall perspective of a healthy human necessary in the medical community. Upon completion of the module, the student will be able to understand important cellular concepts, identify all bones, muscles, nerves and have a sound basis of each organ system. Students will also have mastered the practical skills to be confident in all human body structures and location. (Total notional time: 180 hours)

HUMAN ANATOMY II (HAN206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module builds on prior knowledge of human anatomy and physiology. Upon completion, the student will be able to apply his/her knowledge of cellular components, tissue and organ systems, and overall perspective of a healthy human necessary in the medical community. Upon completion of the module, the student will be able to understand important cellular concepts, identify all bones, muscles, nerves and have a sound basis of each organ system which includes the embryological development of each system. Students will also have mastered the practical skills to be confident in identifying all human body structures and location. (Total notional time: 180 hours)

HUMAN PHYSIOLOGY I (HPH105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

Informed understanding of the core areas of human physiology. The student will be able to understand key physiology terms, concepts, medical related facts, and the general principles of the organisation of the human body, principles of support and movement, control systems of the human body such as the skeletal-, cardiac-, endocrine-, and nervous system, maintenance of the human body, and continuity in theoretical and limited practical contexts contributing to the body of knowledge necessary in the career focused medical community. Upon completion, the student will be able to identify, explain and apply concepts and processes related to physiology, their control and regulation such as homeostasis, nutrition, movement and reproduction and distinguish between mechanical, biochemical and physical functions in a living system and how each system integrates with other systems in the human body. He/she will also have basic practical skills in selected human body structures, functions and their roles. (Total notional time: 120 hours)

HUMAN PHYSIOLOGY I (HPY105P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

The student will be able to apply his/her knowledge of the organisation of the human body, principles of support and movement, control systems of the human body such as the skeletal-, cardiac-, endocrine-, and nervous system, maintenance of the human body, and continuity in theoretical and practical contexts contributing to the body of knowledge necessary in the medical community. Upon completion of the module, the student will be able to identify, explain and apply concepts and processes related to physiology, their control and regulation such as homeostasis, nutrition, movement and reproduction, and distinguish between mechanical, biochemical and physical functions in a living system and how each system integrates with other systems in the human body. Students will also have the practical skills to be confident in all human body functions and their roles. (Total notional time: 180 hours)

HUMAN PHYSIOLOGY II (HPY206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

The student should demonstrate detailed knowledge of the human body's cellular and chemical organisation, the principles of support and movement, the control and maintenance of the human body through the various organ systems, pathophysiology of organ systems and continuity contributing to their understanding of the physiology of a healthy human body. Upon completion, the student will be able to identify, explain and apply concepts and principles of organisation of the human body, control-, maintenance-, and pathophysiology of organ systems, sensory organs and continuity to the extent that they are able to successfully undertake various discipline-specific modules related to human physiology. Students will also have the practical skills to be confident in all human body functions and their roles and apply this knowledge in a clinical setting. (Total notional time: 180 hours)

HYDROGEOLOGY I (HYG216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to hydrology and hydrogeology. Energy transformations and the hydrologic cycle. Elements of the hydrogeologic cycle. Stream hydrographs. Baseflow and groundwater recharge. Porosity and earth materials. (Total notional time: 120 hours)

HYDROGEOLOGY II (HYG316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Groundwater flow to wells. Soil moisture and groundwater recharge. Regional groundwater flow. Geology of groundwater occurrence. Basic water chemistry. Water quality and groundwater contamination. Groundwater development and management. (Total notional time: 180 hours)

HYDROGEOLOGY IV (HYG107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Occurrence of groundwater, how it moves and what influences its quality. Upon completion, the student should be able to: explore for groundwater resources, determine its suitability for different applications and determine the rate at which it is moving. (Total notional time: 250 hours)

HYDROGEOLOGY V (HYG108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Hydrochemistry. Groundwater conceptual modelling. Numerical groundwater flow modelling and mass transport modelling. Environmental isotopes as tracers for groundwater. Groundwater legislation. Interpretation of groundwater modelling results. (Total notional time: 200 hours)

I

IMMUNOHAEMATOLOGY II (IHM216P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire detailed knowledge of Immunohaematology in the field of medical laboratory science. The student will be able to apply his/her knowledge of laboratory equipment, quality assurance, blood donation, systems related to blood transfusion, blood testing and the risks associated with transfusion to the field of medical laboratory science. (Total notional time: 120 hours)

IMMUNOLOGY I (IMM115P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares learners to acquire knowledge and understanding of the structure and function of the immune system, innate and acquired immunity, and laboratory techniques involving the interaction of antigens with antibodies required in the medical laboratory environment. The student will master the ability to demonstrate and apply his/her knowledge and understanding of the fundamental principles and concepts of Immunology, as well as how knowledge of the biological mechanisms evolved and manifest in the pathogenesis of other related diseases in the human body. (Total notional time: 120 hours)

IMMUNOLOGY II (IMM216P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares learning to acquire detailed knowledge and understanding of the structure and function of the immune system, innate and acquired immunity, as well as the application of laboratory techniques involving the interaction of antigens with antibodies required in the veterinary laboratory environment. The student will master the ability to demonstrate and apply his/her knowledge and understanding of the fundamental principles and concepts of Immunology, as well as how knowledge of the biological mechanisms evolved and manifest in the pathogenesis of other related diseases in an organism. (Total notional time: 120 hours)

INDUSTRIAL BIOTECHNOLOGY (IBI117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

This module provides a platform for introducing students to relevant industrial biotechnological concepts, including (but not limited to) industrial enzymes, immobilisation technology, antibiotic production, ethanol production, microbial insecticides, the use of Bacillus thuringiensis as pesticide, genetically modified crops (transgenic crops), biodiversity and biosafety, the influence of biotechnology on industrial products, microbial transformations with industrial applications, as well as microbial polysaccharides. The content will include (but not limited to): Immobilisation technology, Industrial enzymes, Antibiotic production, Ethanol production, Microbial insecticides, Bacillus thuringiensis as pesticide, Transgenic crops, Biodiversity and Biosafety, Influence of biotechnology on industrial products, Microbial transformations with industrial application, Microbial polysaccharides, Independence and Reliability, Professionalism (attention to safety principles), and to interpret and execute instructions, and Drafting a report. (Total notional time: 120 hours)

INDUSTRIAL CHEMISTRY PRACTICE IV (ICC418P) **WORK-INTEGRATED LEARNING**

(Module custodian: Department of Chemistry)

The module is designed to prepare students to function effectively in a working environment, which may include the following industries: petroleum and petrochemicals, pharmaceutical, pulp and paper, food processing, sugar and starch, dyestuffs, cement, paint and coating, fermentation, agrichemicals, mining and ore processing, water and sewage treatment. (Total notional time: 300 hours)

INDUSTRIAL CHEMISTRY PROJECT IV (ICR418P/R) **PROJECT ASSESSMENT**

(Module custodian: Department of Chemistry)

The purpose of this module is to apply the knowledge of industrial synthesis, physical chemistry, organic chemistry, inorganic chemistry, separation science, molecular spectroscopy, process control, catalysis, material science and environmental science and technology in developing suitable methods and procedures for synthetic, production, characterisation, structural determination, transformation using both qualitative and quantitative techniques to propose and design innovative solutions to industrial process chemistry and laboratory problems. (Total notional time: 300 hours)

INDUSTRIAL PHARMACY PRACTICE (IPP246P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

An overview of the pharmaceutical manufacturing facility and organisational layout. Planning for production. The manufacturing facility. The principles and practice of quality assurance, including good manufacturing practices and quality control. (Total notional time: 180 hours)

INDUSTRIAL PHARMACY WORK-BASED LEARNING (IPL246P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

Practical experience in aspects of the medicines regulatory process, production of pharmaceuticals, pharmaceutical research and development, implementing good manufacturing procedures, quality assurance, personnel and business management, as well as the marketing and advertising of pharmaceuticals. (Total notional time: 180 hours)

INDUSTRIAL PHYSICS I (ISPH501) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Physics)

Safety issues in industry. Physics and technology; basic physical principles that govern industrial technology output; work ethics and industrial working conditions. Writing scientific reports. (Total notional time: 100 hours)

INDUSTRIAL PHYSICS II (ISPH600) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Introduction to quantum physics and atomic physics. Nuclear structure, binding energy, models, radioactivity, the decay processes, natural radioactivity, nuclear reactions, nuclear magnetic resonance and magnetic resonance imaging. Applications of nuclear physics (fission, fusion, radiation damage, radiation detectors, uses of radiation). Vacuum technology: vacuum fundamentals, production of vacuum, measurement of vacuum (gauges), sealing techniques in vacuum. Non-destructive testing (NDT), definitions and symbols, visual testing (VT), eddy current testing (ET), liquid penetrant testing (PT) of materials, ultrasonic testing of materials. (Total notional time: 300 hours)

INDUSTRIAL PHYSICS III (ISP306R) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Industrial ventilation: health effects of major indoor air contaminants, ventilation systems, basic testing equipment. Measurements. Vacuum technology: materials in vacuum leak detection, vacuum systems. Non-destructive testing: ultrasonic testing (UT) of materials, magnetic particle testing of materials, radiographic testing of materials. (Total notional time: 200 hours)

INDUSTRIAL PHYSICS IV (IPA107V) **2 X 3-HOUR PAPERS**

(Module custodian: Department of Physics)

Part A (Paper I): Ventilation - Mechanical ventilation; ventilation networks; heat in mines; refrigeration; dust; compressed air. Part B (Paper II): Renewable Energy - Renewable energy technologies; Solar thermal systems; Solar photovoltaic systems; Concentrating solar power; Wind power plants. (Total notional time: 300 hours)

INDUSTRIAL PHYSICS RESEARCH PROJECT (IOR108G, IOR118R, NTR108G, NTR118R) **PROJECT ASSESSMENT**

(Module custodian: Department of Physics)

Identification of research problems; Review of relevant literature; Formulation of research proposal; Experimental techniques and methods; Data analysis methods and techniques; and Project report and presentation. (Total notional time: 360 hours)

INDUSTRIAL SYNTHESIS III (ISY317P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Electron absorption spectroscopy of various transition metal complexes; Industrial extraction, purification, properties and the chemistry of the platinum group metals; Biological and chemical catalysts; Biocatalysis; Preparation, treatment, characterisation and applications of heterogeneous catalysts. (Total notional time: 180 hours)

INDUSTRIAL SYNTHESIS IV (ISY418P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Properties and reactions of chiral organic synthesis; Metals and metalloids-mediated organic synthesis; Biosynthetic pathways of natural products; Synthetic methods of medicinal chemistry and drug design; Preparation, treatment, characterisation and applications of homogeneous catalysts. (Total notional time: 180 hours)

INDUSTRIAL VENTILATION II (IDV118G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Industrial water and electricity; Developments in ventilation; Mechanised mining; Ventilation requirements in a mine; Sampling of airborne dust and diesel particulates; Gases encountered in mines; Illumination in mines. Tunnel ventilation; and Arranged tour to a mine. (Total notional time: 120 hours)

INFECTIOUS DISEASE EPIDEMIOLOGY II (IDE206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Health service delivery in South Africa; foundation of epidemiology; disease observation; prevention and control of communicable disease; disease surveillance and outbreak investigation; expanded immunisation programme in South Africa; parasite and pest vectors (arthropoda, insecta, arachnida); Introduction to communicable diseases and legislation; communicable diseases (viral, bacterial, sexually transmitted, chlamydia, fungal, protozoal); Port Health Services and Global Health. (Total notional time: 180 hours)

INFORMATION LITERACY (INF125D, INL125X) **CONTINUOUS ASSESSMENT**
INFORMATION LITERACY I (INI125D, INI125U) **CONTINUOUS ASSESSMENT**

(Module custodian: Directorate of Library and Information Services)

Introduction of information literacy. Development of a search strategy and application of a search string to search engines and academic databases. Evaluation of information sources. Ethical and legal use of information. (Total notional time: 20 hours)

INORGANIC CHEMISTRY IIA (INA216X) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Covalent and metallic bonding. Ionic Bonding. Solvent systems and acid-base behaviour. Redox Chemistry. Hydrogen and some of its compounds. Alkali metals and their compounds. Alkali earth metals and their compounds. Boron and aluminum and their compounds. Carbon and silicon and their compounds. Nitrogen and phosphorous and their compounds. Oxygen and sulphur and their compounds. The Halogens and their compounds. (Total notional time: 120 hours)

INORGANIC CHEMISTRY IIB (INB216X) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

The Lewis electron-dot structures. Formal charges. The Valence Shell Electron Pair Repulsion Theory. The Valence Bond Theory. The Molecular Orbital Theory. Coordination numbers and geometries. Types of ligands. Nomenclature. Isomers. Crystal field splitting. Distortion of complexes. Properties of the d-block elements. Titanium; Vanadium; Chromium; Manganese; Iron; Cobalt; Nickel; Copper; Silver; Gold; Zinc; Cadmium; Mercury. (Total notional time: 180 hours)

INTEGRATED CYTOLOGY AND HISTOLOGY III (ICH317P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate the ability to recognise and evaluate cellular morphology of the gastro-intestinal tract, serous cavities, central nervous system, breast, thyroid and lymph node and how to apply this knowledge to differentiate between different cells and cellular changes. The student will be able to apply his/her knowledge of cytological techniques to evaluate and identify the cellular changes viewed on the cytological smears. (Total notional time: 120 hours)

INTEGRATED MANAGEMENT SYSTEMS (IMS118G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Introduction to systems management; Principles of systems management; Principles of integrated systems; Systems planning and implementation; Business requirements; Systems management and review; and Quality improvement. (Total notional time: 120 hours)

INTEGRATED PATHOPHYSIOLOGY III (IPY317P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to have integrated knowledge, apply problem-solving skills, as well as produce and communicate information in the field of pathophysiology. The student will be able to apply his/her knowledge of Clinical Chemistry, Haematology/Immunohaematology, Medical Microbiology, and Cytology/Histology to the disordered anatomical and physiological processes associated with disease or injury. This module will prepare the student to develop to apply their knowledge of pathophysiology in a laboratory setting real-world environment. This module will also prepare the student to develop deeper knowledge in the field of pathophysiology in their elective module of Clinical Laboratory Practice on an NQF Level 7. (Total notional time: 120 hours)

INTEGRATED PROJECT MANAGEMENT (IGP117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Theory of project management, ISO 21500:2012 Guidance on Project Management, Risk management in a project environment/ISO 31000, Project management principles, Project management tools, Developing a project plan, Management and Control of Projects, Project Scheduling and budgeting, Project management in a Quality environment, and project reporting. (Total notional time: 120 hours)

INTEGRATED URBAN/RURAL WATER AND SANITATION RESEARCH PROJECT III (PIU107V) **PROJECT ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Compiling an integrated urban/rural masterplan for water supply and sanitation. Introduction, preparation of Masterplan for Water Supply and Sanitation, technical report, presentation. (Total notional time: 210 hours)

INTRODUCTION TO BIOPHARMACEUTICS, PHARMACOKINETICS AND PHARMACODYNAMICS (IBP145P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

An introduction to health-care interventions and biopharmaceutics (processes prior to drug administration), pharmacokinetics (processes that include drug absorption, distribution, metabolism and excretion) and therapeutic drug monitoring and pharmacodynamics (drug action). (Total notional time: 210 hours)

INTRODUCTION TO CLINICAL VETERINARY TECHNOLOGY I (CVT105P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module equips students with pre-requisite knowledge in preparation to the clinical environment of the Veterinary Technology Profession, including its code and ethics, laboratory and personnel safety and witnessing of laboratory test methods, techniques and procedures. Students should furthermore familiarise themselves with key terms used in quality control as well as guidance when reporting notifiable diseases as well as rules in the use of animals in laboratories. (Total notional time: 240 hours)

INTRODUCTION TO ENVIRONMENTAL AND WASTE MANAGEMENT (IEW105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

The module introduces the student to the terminologies and principles of Environmental and Waste Management in terms of the following: (1) Generation of waste to treatment, transportation and waste disposal. (2) Resource management and waste hierarchy. (3) Waste classification. (4) Waste beneficiation, recycling economy and entrepreneurship. (5) Waste legislation and policies as well as the life cycle approach to resource management. This module prepares a student with fundamental waste disposal techniques and technologies, also provides fundamental procedures and protocols for health and safety, prevention and mitigation measures. Upon completion, the student will be able to apply the knowledge and skills to safely handle, treat and dispose different waste type in an environmentally sound manner. (Total notional time: 120 hours)

INTRODUCTION TO ENVIRONMENTAL HEALTH I (IEV105P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

History of environmental health; sustainable development concept and its application; ethics and professionalism; scientific writing. (Total notional time: 200 hours)

INTRODUCTION TO ENVIRONMENTAL IMPACT MANAGEMENT (IEI105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

This module introduces the students to environmental law, regulations and by-laws relevant to waste management. In particular, students will gain an understanding of the various compliance and enforcement strategies and measures. It will also equip the student with methodologies and important tools for sound environmental assessment, management and decision-making. Students who complete the module will have an overview of the concepts, methods, issues and the various stages of the EIA process as well as gain an in-depth understanding of the evaluation and overall administration of environmental authorisations. Some case studies will be provided on environmental authorisations in the various economic sectors including infrastructure, spatial development and planning. Other topics covered are integrated environmental management, environmental governance, reporting and institutional cooperation. (Total notional time: 120 hours)

INTRODUCTION TO ENVIRONMENTAL SCIENCE (INS105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

The module provides a view on the state of the environment in South Africa, pollution, resource management and climate change mitigation. The module focuses on the inter-relationships between the physical and biological environment and resource management as well as an introduction to sustainable development and international multilateral environmental agreements including the United Nations Sustainable Development Goals (SDGs). These include the application of biological, chemical, and physical principles and the solution to the environmental problems. The student will be equipped with knowledge of sources of waste, mobility, transformations, environmental and health impacts from different environmental matrices. Upon completion, students will be able to apply basic pollution science knowledge, identify type of waste, point and non-point sources of waste pollution and their potential effects. The module prepares a student to apply knowledge and skills in the industrial processes, particularly resulting waste. (Total notional time: 120 hours)

INTRODUCTION TO INDUSTRIAL WASTE (IIW105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

This module provides students with the background and introduction to industrial processes such as oil and gas, medical, mining, energy production, chemical synthesis and manufacturing of products; and their waste generating activities and impacts on the local and global environment and how those impacts can be mitigated or eradicated. This module intends to equip students with the necessary knowledge and skills on the ever-changing industrial processes. (Total notional time: 120 hours)

INTRODUCTION TO MIDWIFERY (IMW216P) **CONTINUOUS ASSESSMENT**

(Module custodian: Adelaide Tambo School of Nursing Science)

This module prepares the student to have detailed knowledge of the main areas of the field of Midwifery including an understanding of and ability to apply the State of World Midwifery to the South African context of Midwifery practice. Further, the student is able to demonstrate an ability to evaluate and apply appropriate methods of interviewing a pregnant couple, interpreting the information gathered and making a simple midwifery diagnosis. Upon completion of the module, the student will be able to demonstrate the ability to analyse and solve problems of a normal pregnant woman and partner and demonstrate an understanding of the ethical implications of decisions and actions within the professional context. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time, 18 hours of practical and 19.5 hours of self-directed learning (including assessment time))

INTRODUCTION TO PHARMACOLOGY IN NURSING (IPN115P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Pharmaceutical Sciences)

This module introduces the student to pharmacological principles and concepts related to drug administration, drug scheduling, legal aspects and drug allergies. Upon completion of the module, the student will be able to demonstrate the basic competencies such as drug calculation, application of drug abbreviations and the listing of common drug side-and adverse effects and the supplication of the ethical and legal aspects, concerning nursing and midwifery. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time and 37.5 hours of self-directed learning (including assessment time))

INTRODUCTION TO POSTGRADUATE RESEARCH (IPG117V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biotechnology and Food Technology)
Introduction to research; research tools; basic research management; introduction to ethics and ISO; fundamentals of scientific writing skills; basic research design; and presentation skills. (Total notional time: 120 hours)

INTRODUCTION TO RESEARCH (IRF117V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biotechnology and Food Technology)
Introduction to research; research tools; basic research management; introduction to ethics and ISO; fundamentals of scientific writing skills; basic research design; and presentation skills. (Total notional time: 120 hours)

INTRODUCTION TO RESEARCH (RKS117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module proves students with knowledge of and engagement in techniques of drafting research proposal, data collection and analysis, and writing research reports. Such knowledge includes an understanding of the principles of research problem identification and statement, formulation of research questions, objectives and hypotheses. The module further provides the student with competencies including, but not limited to: review, analysis, writing and reporting, and communication competencies. (Total notional time: 120 hours)

INTRODUCTION TO RESEARCH I (RNS216P) **1 X 3-HOUR PAPER**
(Module custodian: Adelaide Tambo School of Nursing Science)
The student will be able to apply his/her knowledge of research to the clinical areas of nursing, midwifery including mental health nursing practice and in the community with reference to the introduction to research, the research process, ethics and finding information. Upon completion of the module, the student will be able to demonstrated knowledge, comprehension and application of research understanding when providing evidence based care; to demonstrate guided response in gaining the skill of academic reading, use of academic writing skills in writing assignment including citing and proper referencing using appropriate c-referencing style. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time and 37.5 hours of self-directed learning (including assessment time))

INTRODUCTION TO RESEARCH (RWS117V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Environmental, Water and Earth Sciences)
This module prepares the student to demonstrate detailed knowledge of and to evaluate the key terms, concepts, facts, principles, rules and theories of: literature review, research competencies, scientific writing skills and communication. (Total notional time: 120 hours)

INTRODUCTION TO RESEARCH I: SOMATIC THERAPY (IST107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
The student will be able to apply knowledge as well as an ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories of research in related fields of study in Science. The module should further provide the student with competencies such as, but not limited to review, research, writing and reporting, and communicating competencies. (Total notional time: 120 hours)

INTRODUCTION TO RESEARCH METHODOLOGY (RQM117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Mathematics and Statistics)
Literature Review, Hypotheses and research objectives Research methods, Data collection methods, Statistical methods and data analysis, Research ethics, and creative writing. (Total notional time: 120 hours)

INTRODUCTION TO RESEARCH METHODOLOGY: PHARMACEUTICAL SCIENCES (RPS107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
The purpose of this module is to provide a student with detailed knowledge as well as an ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories of research in the pharmaceutical sciences field. (Total notional time: 120 hours)

INTRODUCTION TO WASTE DIVERSION (IWD105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

This module introduces the student to the methodologies, policies, practices, systems and technologies associated with waste diversion. The module deals with the intergovernmental policies and legal requirements from the various spheres of government responsible for waste: (1) Collection, storage, transportation and disposal. (2) Reduction and prevention, reuse, recycle, recover, treatment and disposal and (3) general and hazardous waste classification. (4) Transformation of waste into resources for economic production. The student will gain an in-depth knowledge in the aspects of waste separation at source, waste minimisation, sorting, waste beneficiation and the major ways of recycling waste including methods of evaluating the effectiveness of waste reduction, monitoring and assessment. Various case studies will be discussed on effective waste diversion techniques and technologies. (Total notional time: 120 hours)

INTRODUCTION TO WASTE INNOVATION (IWI105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Waste to Energy and Waste Derived Fuels; Waste beneficiation; Circular economy; Life cycle approaches to waste reduction; Product design, single use and end of life theories; Green economy and smart cities; Development on alternatives to plastic; Extended Producer Responsibility; Modern Landfill Design and Operations Management; Principles of green chemistry; e-Waste Management; and Digital waste sorting, tracking and destruction certification. (Total notional time: 120 hours)

J

JURISPRUDENCE (JUR117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

In depth knowledge of the Dental Technicians Act, 1979 (Act No. 19 of 1979), municipal by-laws and legal aspects regarding the founding of a dental laboratory a part requirement to be registered with the SADTC as a Dental Technologist entitling the student to be a laboratory owner, be an employer, and supervise a dental laboratory. (Total notional time: 60 hours)

JURISPRUDENCE (JUR205D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Legal aspects of dental technology in South Africa. (Total notional time: 150 hours)

L

LABORATORY FINANCIAL MANAGEMENT (LFM108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Chemistry)

Laboratory economy, procurement, stock management, financial statements, financial indicators and strategic business planning. (Total notional time: 300 hours)

LABORATORY MANAGEMENT II (LBG117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

General laboratory management (with emphasis on management of laboratory resources, safety and productivity, problem-solving and decision-making); Laboratory personnel management (documentation and personnel management); Laboratory financial management (financial management to control laboratory costs); Quality and productivity (quality management systems, continuous quality improvement, evaluation of quality management system and customer satisfaction). (Total notional time: 120 hours)

LABORATORY MANAGEMENT IV (LBT418P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

The purpose of this module is to provide students with standard operational management of veterinary laboratories, as well as their financial and human resources. Furthermore, this module introduces students to Quality Management Systems which is necessary as more Veterinary Laboratories are becoming Quality Assured. (Total notional time: 120 hours)

LABORATORY ORGANISATION MANAGEMENT (LOR108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Chemistry)

ISO systems (17025), organisational structure, personnel management, laboratory facilities management, LIMS and document control. (Total notional time: 300 hours)

LABORATORY QUALITY AND PRODUCTIVITY MANAGEMENT (LQP108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Chemistry)

Administration, auditing, personnel management, instrumentation, record control and application of statistical techniques. (Total notional time: 300 hours)

LABORATORY SAFETY MANAGEMENT (LSF108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Chemistry)

Facilities design, chemical hazards, Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) safe work practices, safety training, housekeeping and chemical waste disposal. (Total notional time: 300 hours)

LANDSCAPE AND COMMUNITY ECOLOGY (LCE108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Upon completion of this module, students will have an understanding of landscapes and the communities they contain and how to integrate it in the field of Environmental Science. They will also apply relevant theories, research and methods to managing these environments in a sustainable and ecologically friendly manner. (Total notional time: 240 hours)

LANDSCAPE MAINTENANCE I (LMT206D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Horticulture)

Plant nutrition and fertilizing. Plant protection. Turf grass culture. Machines and hand tools. General standards and norms. (Total notional time: 240 hours)

LANDSCAPE MANAGEMENT II (LDM316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Horticulture)

Human resource management, including labour relations, job descriptions and specifications, human resource planning, personnel motivation, training and development, performance appraisal, remuneration and delegation, communication, labour and relations and supervision and compilation of a basic health and safety file. Contract management, including definitions, types and importance of contracts, formulation of contracts and contract clauses. Tenders and bill of quantities. Definitions and types of tenders, designing and completing tender documents. (Total notional time: 120 hours)

LANDSCAPE PROJECT (LNP108G/LNP118R) **PROJECT ASSESSMENT**

(Module custodian: Department of Horticulture)

The qualified student will be well equipped to apply quantitative as well as qualitative research methodologies in related fields such as designing of specialised areas and solving complex environmental issues such as the decreasing of carbon dioxide, and enhancing urban agriculture in urban areas to improve the social responsibility in South Africa. The student will be able to have clear objectives on how to solve environmental and landscape design related issues in a descriptive manner. The student will have adequate knowledge on how to plan the research project and understand all relevant research processes. (Total notional time: 240 hours)

LANDSCAPE TECHNOLOGY MANAGEMENT (LTM107V) **PROJECT ASSESSMENT**

(Module custodian: Department Horticulture)

The purpose of this module is to equip the students with a broader knowledge of understanding the process of project management and the relevant phases/sequence of related projects in the green industry. Students will use the acquired competencies to address and apply techniques in the execution landscape projects to achieve projects in due time. The understanding and application of the correct procedures on the Health and Safety regulations based on green industry projects will be addressed. (Total notional time: 300 hours)

LANDSCAPE TECHNOLOGY PROJECT PRINCIPLES (LTP107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department Horticulture)
This module will provide a student with detailed knowledge and skills to apply and evaluate the key concepts, principles and rules of research in landscape technology. A student will be able to identify a problem in a work or industry related environment, conduct a literature search and process information to formulate a background and justification, objectives, hypothesis and/or research question related to problem-solving. A student will furthermore, be able to design an experimental layout and/or questionnaire, to address the hypothesis/research question and relevant data collection/sampling methodology according to acceptable ethical research practices and problem-solving principles. The acquired skills will be used to develop a complete research proposal on a selected topic solving specific problems in the landscape technology industry and South African community according to sound research principles. Communication skills, reasoning and logical thinking will be developed through oral presentation to peers. (Total notional time: 300 hours)

LASER AND FIBRE OPTICS I (LFO107V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics
Wave Nature of Light; Dielectric Waveguides and Optical Fibres; Semiconductor Science and Light-emitting Diodes; Stimulated Emission Devices Optical Amplifiers and Lasers; Photodetectors and Image Sensors; Polarisation and Modulation of Light; Optical Fibres and Cables; Optical Fibre Connections, Joints Couplers and Isolators. (Total notional time: 240 hours)

LASER AND FIBRE OPTICS II (LFO108G) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Stimulated emission devices and optical amplifiers and lasers; Photo-detectors and image sensors; Polarisation and modulation of light; Optical amplification; wavelength conversion and regeneration; Integrated optics and photonics; Optical fibre systems: intensity modulation/direct detection; Optical fibre systems: coherent and phase-modulated; Optical fibre measurements; and Optical networks. (Total notional time: 180 hours)

LIFE SKILLS (LFS125X, LSKH501) **CONTINUOUS ASSESSMENT**
LIFE SKILLS I (LFI125X, LFI125U) **CONTINUOUS ASSESSMENT**
(Module custodian: Directorate of Student Development and Support)
Personal, socio-emotional and academic skills development for students in higher education. This module includes: 1. Intra- and interpersonal skills (e.g. emotional intelligence, relationships, and conflict management); 2. General study skills (e.g. time management, goal setting, learning styles); 3. Health and wellness (e.g. HIV/AIDS, GBV issues, substance abuse); 4. Student life and adjustment (e.g. identity development, adjusting to a higher education environment); and 5. Financial management. (Total notional time: 20 hours)

LODGE MANAGEMENT I (LMG206D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Nature Conservation)
This module introduces the student to the basic principles and concepts of lodge management, to acquire skills and competencies needed to communicate effectively in a general work environment and specifically in the wildlife and game lodge industry. It also introduces the student to principles and activities on how to manage guests at a lodge in terms of welcoming, entertainment and general hospitality services. Secondly, it addresses Environmental Education (EE) that focuses on introduction to EE in general and sustainable living and development with specific application in the game lodge industry, trends in EE and learner centered and teacher centered activities. Furthermore, the module also introduces guiding principles and focuses on providing the student with a conceptual understanding of guiding, focusing on guiding principles, types of guides, and legal aspects of the guiding trade with specific reference to the game lodge industry. (Total notional time: 120 hours)

M

MAGNETIC RESONANCE IMAGING (MRI) (MRI408P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to acquire forefront knowledge and understanding of principles and instrumentation of magnetic resonance imaging, the Larmor frequency and the implications on image contrast, the role, effect, and safety of contrast media in MRI, as well as to master theories, methods and techniques relevant to high technology MR Imaging. (Total notional time: 280 hours)

MAMMOGRAPHY (MGY408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire, apply, integrate and demonstrate in-depth forefront knowledge, principles and clinical practice of mammography to ultimately be positioned to be credited, and after required specialised training, become a practicing mammographer. This student will then be able to work in a multi-disciplinary health environment. The student will be able to apply his/her integrated knowledge of mammography, within simulated and unfamiliar radiography environments. (Total notional time: 120 hours)

MANAGEMENT PRACTICE IV (MAP408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Key aspects of criminal law, investigation and procedure in an environmental compliance and enforcement context; principles and guide lines of change management, conflict management and diversity management; environmental health information system; financial and personnel management; the district health system; principles of entrepreneurship. (Total notional time: 150 hours)

MANAGEMENT PRINCIPLES I (MPI107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This elective learning module covers Organisational Management and the diversity in South African organisations. It further enables the student to resolve problems and introduce change within the field of Organisational Management, specifically in the conservation, wildlife and ecotourism industry. The focus of the module is to provide the student with the knowledge to understand management in the context of the nature conservation and other associated industries. (Total notional time: 180 hours)

MARE AND FOAL MANAGEMENT II (MFM216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students are capacitated with a detailed knowledge of equine stable management and horse husbandry principles and practice. Students will acquire knowledge, skills and applied competencies in areas such as: Mare reproductive biology and endocrinology; Broodmare selection practices; Mare infertility; Natural and assisted reproductive techniques; Parturition, dystocia and care of the neonatal foal; Managing the weanling, yearling and the lactating mare; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 120 hours)

MATERIAL SCIENCE (MTS118G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Chemistry)

Fundamental concepts and structure of materials. Structure of crystalline and amorphous solids. Imperfections, failure, dislocations and strengthening mechanisms in materials. Phase transformation in metals and thermal processing of metal alloys. Ceramics - structure, properties, processing & applications. Polymer structures and composites (Total notional time: 150 hours)

MATERIAL SCIENCE I (MTSH500) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Introduction to materials: atomic structure, atomic and ionic arrangements. Defects in solids. Magnetic properties of materials. Crystalline and polycrystalline material; thermal properties of materials. (Total notional time: 200 hours)

MATERIAL SCIENCE II (MTSH601) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Diffusion in materials, mechanical properties, optical properties of materials, amorphous materials, deformation and strengthening mechanism, solid solutions and phase equilibrium, corrosion and degradation of materials. (Total notional time: 150 hours)

MATERIAL SCIENCE IIIA (MSA317P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Fundamental concepts and structure of materials; Structure of crystalline and amorphous solids; Imperfections, failure, dislocations and strengthening mechanisms in materials. (Total notional time: 120 hours)

MATERIAL SCIENCE IIIB (MSB317P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Phase diagrams, phase transformation in metals and thermal processing of metal alloys; Ceramics: structure, properties, processing and applications; Polymer structures and composites. (Total notional time: 120 hours)

MATHEMATICS I (MAT105X) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Consolidation of existing knowledge of and introduction to new types of functions; solution of systems of equations using matrices; introduction to vector algebra and complex numbers; application of differentiation and integration to solve well-defined problems. (Total notional time: 240 hours)

MATHEMATICS I (MATH500) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Basic mathematics. Differentiation. Integration. Matrices. (Total notional time: 200 hours)

MATHEMATICS II (MAT206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Series expansions; Applications of differentiation; Partial differentiation; Integration techniques; Applications of integration; and first-order ordinary differential equations (ODEs). (Total notional time: 240 hours)

MATHEMATICS II (MATH600) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Differentiation: logarithmic differentiation, implicit functions, the inverse of trigonometric functions, the hyperbolic functions, parametric functions, applications. Partial differentiation: first-order partial derivatives, small increments, rates of change, changing of the variables, errors. Integration: fundamental integration formulae, factor integration, partial fractions, hyperbolic functions, standard forms, applications. First-order differential equations: introduction and definitions, direct integration, separation of variables, exact equations, linear equations, Bernoulli's equation, applications. (Total notional time: 200 hours)

MATHEMATICS AND STATISTICS I (MAS105X, MAS105U) **1 X 3-HOUR PAPER**
MATHEMATICS AND STATISTICS (MST105X) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Numerical computations, mensuration, equations, functions, descriptive statistics, linear regression and curve fitting. (Total notional time: 120 hours)

MAXILLOFACIAL PROSTHETICS (MXP117V) **1 X 3-HOUR PAPER AND PRACTICAL ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Theoretical knowledge and practical skills to design and manufacture artificial eyes, ears, noses, appliances for cleft palate and mouth controlled appliances for disabled persons. This is a part requirement to be registered with the SADTC as a Dental Technologist entitling the student to be a laboratory owner, be an employer, and supervise a dental laboratory. (Total notional time: 60 hours)

MEDICAL BIOTECHNOLOGY (MBI117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

Upon completion of the module, the student will be able to define, characterise, discuss and observe the use and manipulation of mammalian cell cultures for health and environmental purposes. Students will acquire knowledge that will enable them to grow, store, characterise, validate and manipulate mammalian cells as well as manage bio intellectual property. The content will include (but not limited to): Growth, storage, validation and characterisation of Mammalian cells, Genetic manipulation of mammalian cells and stem cells and Essential management of intellectual property. (Total notional time: 120 hours)

MEDICAL LABORATORY SCIENCE I (MLS115P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire an informed understanding of the basic principles of medical laboratory medicine as related to knowledge of the professional role of the medical laboratory scientist, ethics, medical law and human rights, relevant laboratory instrumentation and techniques and laboratory safety to the field of laboratory sciences. The student will be able to demonstrate the ability to advice on the professional role of the medical laboratory scientist within the sphere of medical laboratory science and as part of a health-care team. Select and contrast laboratory instrumentation and techniques in the medical laboratory science environment. Apply laboratory safety and evaluate medical ethics and human rights in the discipline of medical laboratory science. (Total notional time: 120 hours)

MEDICAL LABORATORY SCIENCE II (MLS216P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to apply detailed knowledge of the concepts and principles of medical laboratory medicine as related to phlebotomy, quality assurance and the professional role of the medical laboratory scientist in the field of ethics, medical law and human rights. The student will be able to classify and explain detailed knowledge on phlebotomy and specimen processing, advice on the concepts of quality assurance and explain medical ethics, medical law and human rights applicable to laboratory medicine. (Total notional time: 60 hours)

MEDICAL LAW, BIO-ETHICS AND HUMAN RIGHTS (MBR315P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module will present the following main learning areas: Medical law, specifically legal principles and business law. Bioethics and human rights, specifically the morality and ethics, moral theories, integrity, human rights and bioethics principles, required for a Clinical Technologist to function independently in the healthcare fraternity and to demonstrate the ability to work in medical and business practice contexts from a framework of medical law, bioethics and human rights. (Total notional time: 60 hours)

MEDICAL LAW, BIO-ETHICS AND HUMAN RIGHTS I (MBH115P) **CONTINUOUS ASSESSMENT**
MEDICAL LAW, BIO-ETHICS AND HUMAN RIGHTS II (MBH216P) **CONTINUOUS ASSESSMENT**
MEDICAL LAW, BIO-ETHICS AND HUMAN RIGHTS III (MBH317P) **CONTINUOUS ASSESSMENT**
MEDICAL LAW, BIO-ETHICS AND HUMAN RIGHTS IV (MBH418P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares students to acquire knowledge that achieves deep learning and fundamental understanding of medical law, bioethics and human rights. The student will be able to apply his/her knowledge of medical law, bioethics and human rights to clinical professional practice in a healthcare context. The module will present the following main learning areas: 1. Medical law, specifically legal principles and business law; and 2. Bioethics and human rights, specifically the morality and ethics, moral theories, integrity, human rights and bioethics principles, required for a Clinical Technologist to function independently in the healthcare fraternity and to demonstrate the ability to work in medical and business practice contexts from a framework of medical law, bioethics and human rights. The module will further serve to build upon initial requirements of medical law and bioethics concepts progressing to a deep understanding of the fundamental principles about bioethics, integrity and moral reasoning in the health care and health research environment. (Total notional time: 90 hours)

MEDICAL MICROBIOLOGY II (MMI216P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to be able to apply detailed knowledge of medical microbiology preparing students to be knowledgeable in the field of medical laboratory science. The student will be able to apply and evaluate his/her knowledge of principles, procedures and correlation for diagnostic testing and organ-specific function testing for medical microbiology to attain practical and professional competence in the workplace. Furthermore, through the integration of the theoretical and practical component of this module, the student will acquire knowledge, skills, and values in clinical laboratory practice to manage him/herself on an elevated professional level, as well as the awareness to take responsibility for the learning of others in a professional career environment, contributing to highly skilled scientists in laboratory medicine. (Total notional time: 120 hours)

MEDICAL MICROBIOLOGY III (MMI317P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to be able to select methods that will assist to examine and illustrate integrated knowledge and understanding of the isolation of clinical and diagnostic problems through critical and innovative thinking being responsible and independent in decision-making and application of basic and advanced scientific methods within the medical laboratory set-up. (Total notional time: 120 hours)

MEDICAL MICROBIOLOGY III (MMB316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

Upon completion of the module, the student will be able to define, characterise, discuss and observe factors related to microorganisms, their control, as well as their influence on humans and the environment in the field of medical microbiology (such as infection and pathogenicity of microorganisms, non-specific host resistance, specific immunity, antimicrobial chemotherapy, clinical microbiology, epidemiology of infectious diseases and public health, human diseases caused by: viruses and prions, gram-positive and gram-negative bacteria, other bacteria (chlamydia, mycoplasmas, rickettsia; dental and nosocomial infections), as well as diseases caused by fungi and protozoa. (Total notional time: 150 hours)

MEDICINE GOVERNANCE (MGO107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

The role of the pharmaceutical regulatory scientist, South African legislative process and key concepts in the process of law making; Key concepts of Medicines and Related Substances Act, 1965 (Act No. 101 of 1965); The Pharmacy Act, 1974 (Act No. 53 of 1974) consolidated); the international pharmaceutical arena and its impact on S.A. regulatory practice; the classification medicinal products and Complementary and Alternative Medicines (CAMs); Requirements for medicine registration in S.A.; the South African Common Technical Document (CTD) Guidelines as well as the South African Health Products Regulatory Authority (SAHPRA) post registration processes. (Total notional time: 240 hours)

MEDICINES REGULATORY SCIENCE (MRS108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

This module prepares the student to integrate and apply detailed pharmaceutical science knowledge in the medicines regulatory science and governance process. A wide range of topics associated with role of the pharmaceutical regulatory scientist, the South African legislative process and key concepts in the process of law making; key concepts of Medicines and Related Substances Act, 1965 (Act No. 101 of 1965); the Pharmacy Act, 1974 (Act No. 53 of 1974) (Consolidated)); the international pharmaceutical arena and the impact on S.A. regulatory practice; the classification of medicinal products and complementary and alternative medicines (CAMS); requirements for medicine registration in S.A.; the South African Common Technical Document (CTD) Guidelines as well as the SAHPRA post-registration processes. (Total notional time: 420 hours)

METAL PARTIAL DENTURES (MRD107V) **1 X 3-HOUR PAPER AND PRACTICAL ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Theoretical knowledge and practical skills to design and manufacture clinically acceptable metal frame partial dentures. (Total notional time: 180 hours)

METROLOGY I (MTLH501) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Standards and standardisation. Components in measuring systems. Measurement in Practice. Calibration of laboratory equipment. Radiometric laboratory. Photometric laboratory. Colorimetric laboratory. Fibre-optic laboratory. Typical equipment and application. (Total notional time: 100 hours)

MICROBIAL BIOCHEMISTRY II (MBC216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

The module prepares the student to apply fundamental and specialised knowledge of biological chemistry in the field of biotechnology. The student will be able to apply his/her knowledge of structural biochemistry, metabolism of carbohydrates, proteins and lipids, as well as photosynthesis. This module offers a clear understanding of microbial metabolism and behaviour, central to proper functioning in a biotechnology field, ensuring productivity and skillful resolution of problems. (Total notional time: 120 hours)

MICROBIAL BIOPROCESSING III (MBP316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

The module introduces the student to Bioprocesses using microorganisms, covering concepts such as beer brewing, using microorganisms to treat sewage, fermented foods, production of amino acids, Single Cell Protein production, microbial enzymes and yeast production. The unit facilitates the student to apply basic knowledge acquired in the fundamental modules to bioprocesses used worldwide through group work, presentations and/or scientific reports. (Total notional time: 180 hours)

MICROBIAL TAXONOMY II (MBT216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

Introduction to microbial taxonomy. Fundamentals of taxonomy including identification, classification and nomenclature. Classification systems. Phylogenetic. Phenetic. Levels of classification. Evolutionary processes and the species concept. The three-domain alternative. The kingdom systems (5 and 7). The concept and definition of microbial species. The groups of techniques applied in taxonomy. The classical characteristics. Ecological. Biochemical, Physiological. Molecular Based techniques. Microbial phylogeny. Phylogenetic trees. Molecular markers. Endosymbiotic theory. Bergey's manual. (Total notional time: 150 hours)

MICROBIOLOGY I (MIB105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

History and scope of Microbiology. The study of microbial structure. Prokaryotic cell structure and function. Microbial nutrition. Microbial growth. The control of microorganisms by physical and chemical agents. Viruses and other acellular agents. Infection and pathogenicity. Eukaryotic cell structure and function. Fungi. Protists. Microbiology of air. (Total notional time: 240 hours)

MICROBIOLOGY I (MIB105P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

General microbiology (microbial structure and function, nutrition, growth and control); overview of eukaryotic micro-organisms and viruses; basic microbial taxonomy and main groups of microorganisms; interaction of micro-organisms with their environment (air, soil, water, human beings, other microorganisms); introduction to public health microbiology and epidemiology; and food microbiology. (Total notional time: 150 hours)

MICROBIOLOGY I (MBL115P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

This module prepares the student to understand the role of microorganisms and their importance in the field of Microbiology. It is therefore suitable for continuing specialisation by reiterating general microbiology concepts and a systematic understanding of the diversity of microorganisms in terms of their morphology, physiology and their behaviour as they interact with the components of their habitats. This module will contribute to the preparation of technologists to perform microbiological techniques applicable to, water, food, soil and the medical and veterinary fields. (Total notional time: 120 hours)

MICROBIOLOGY I (MBY216P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

This module prepares the student to understand the role of microorganisms and their importance in the field of Microbiology. It is therefore suitable for continuing specialisation by reiterating general microbiology concepts and a systematic understanding of the diversity of microorganisms in terms of their morphology, physiology and their behaviour as they interact with the components of their habitats. This module will contribute to the preparation of technologists to perform microbiological techniques applicable to, water, food, soil and the medical fields. (Total notional time: 120 hours)

MICROBIOLOGY II (MBL216P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to be able to apply detailed knowledge of microbiology and to be knowledgeable in the field of veterinary technology. The student will be able to apply and evaluate his/her knowledge of principles, procedures and correlation for diagnostic testing and organ-specific function testing for microbiology to attain practical and professional competence in the workplace. Furthermore, through the integration of the theoretical and practical component of this module, the student will acquire knowledge, skills, and values in a practical laboratory environment to manage him/herself on an elevated professional level, as well as the awareness to take responsibility for the learning of others in a professional career environment, contributing to an informed and highly skilled veterinary technologist. (Total notional time: 120 hours)

MICROORGANISMS, MAN AND MEDICINES (MMM145P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

A study of medically important micro-organisms, including bacteria, viruses, fungi, protozoa, helminths and arthropods. Biological and microbiological aspects of structure, growth, diagnosis, virulence, pathogenesis, sensitivity, resistance and transmission. An introduction to the body's defences against infection, including the lymphatic system, cells of the immune system and inflammatory and hypersensitivity reactions. Additional agents used in infections. (Total notional time: 210 hours)

MIDWIFERY I (MDW307P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

The student will be able to apply his/her knowledge of the care of the woman and family to optimal health, her family and baby, pre-partum, intra-partum and post-partum. The student will be enabled to apply knowledge gained to prepare the woman and family for pregnancy and childbirth, conduct a comprehensive assessment of history taking, a physical examination and interpretation of the findings thereof using varied available technologies. Upon completion of the module, the student will be able to critically reflect on and address complex midwifery problems, and apply evidenced based solutions to the management of the woman and the family. (Total notional time: 240 hours, consisting of 75 hours of instructional time, 54 hours of practical and 111 hours of self-directed learning (including assessment time))

MIDWIFERY II (MDW408P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

This module prepares the student to be a critical thinker, using the scientific decision-making process to maintain the optimal health of a woman, her family and baby, (pre-partum, intra-partum and post-partum) through theoretical and practical facilitation. The module enables the student to apply knowledge gained to prepare the woman and family for pregnancy and childbirth, conduct a comprehensive assessment of history taking, a physical examination and interpretation of the findings thereof using varied available technologies. Upon completion of the module, the student will develop a range of specialised skills to identify, analyse and address complex or abstract problems drawing from the body of knowledge and methods appropriate for Midwifery. Finally, she\he will demonstrate the ability to address ethical issues based on critical reflection on the relevance of different value system contexts. (Total notional time: 240 hours, consisting of 60 hours of instructional time, 24 hours of practical and 156 hours of self-directed learning (including assessment time))

MINERALOGY (MIG115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to Mineralogy and Physical Properties of Mineral. Atoms and Chemical Bonding. The Formation of Crystalline Solids. Morphology of Crystals. Berzelian Classification of minerals. Native Elements and Sulphides. Oxides, Hydroxides and Halides. Carbonate minerals. Sulphates, Phosphates, Vanadates, Tungstates and Molybdates. Neso- and Sorosilicates. Cyclo- and Inosilicates. Phyllosilicates. Tectosilicates. Mineraloids. (Total notional time: 60 hours)

MINING AND EXPLORATION GEOLOGY (MEG316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Mineral area selection. Mineral deposit models. Exploration design and strategy. Mineral Exploration Case Studies 1. Mineral Exploration Case Studies 2. (Total notional time: 180 hours)

MINING AND EXPLORATION GEOLOGY IV (MEG107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Mineral exploration, mineral resource drilling and mining methods to extract ore deposits. Upon completion, the student should be able to: explore for mineral resources, conduct on site mineral drilling programs and carryout geotechnical duties at a producing mine. (Total notional time: 250 hours)

MINING AND EXPLORATION GEOLOGY V (MEG108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Ore reserves estimations. Ore body modelling techniques. Mine feasibility studies and mineral economics. Ore reserves and grade calculations. Assessment of the mining financial indicators. SAMREC code. Coal resources and coal reserves classification. Mine and grade tonnage curves. Mine break-even point. Mine Call Factor (Total notional time: 200 hours)

MODERN TECHNOLOGIES IN HEALTH CARE (MTH347P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

Principles of molecular biology, the principles, methods and products of biotechnology, such as fermentation, recombinant DNA technology, gene therapy and immunological assays as applied to the diagnosis, prevention and treatment of inherited and acquired diseases. Theory and practice of new drug delivery systems. The immune system response and host defence mechanisms, with particular reference to diseases that can be prevented through immunisation. The principles and production of vaccines, antisera, immunoglobulins and the principles of hybridisation technology. (Total notional time: 180 hours)

MOLECULAR BIOLOGY II (MLB206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biotechnology and Food Technology)

Genes: Structure, Replication and Expression. Microbial Genetics: Regulation of gene expression. Microbial Genetics: Mechanisms of genetic variation. Recombinant DNA Technology. Microbial Genomics. (Total notional time: 150 hours)

MOLECULAR SPECTROSCOPY (MSP117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Principles of Molecular Spectroscopy (IR, Raman, NMR and MS). Wave and particle properties of electromagnetic radiation, its interaction with matter and the spectroscopic techniques associated with the spectrum obtained. Interpretation of Spectra. Spectral Analysis of Organic and Polymer Molecules. Spectral Analysis of Inorganic Compounds and Minerals. Industrial and Environmental Applications. (Total notional time: 150 hours)

MOLECULAR SPECTORSCOPY I (MSP216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Electromagnetic radiation and its interaction with matter. Quantised energy levels and introductory spectroscopy. UV/VIS spectrophotometry. Beer-Lambert law. Infrared spectroscopy. Mass spectroscopy. Nuclear Magnetic Resonance Spectroscopy. (Total notional time: 180 hours)

MOLECULAR SPECTROSCOPY III (MSP317P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Introduction to Molecular Spectroscopy; Ultra-violet/Visible Spectroscopy; Infrared Spectroscopy; Mass spectroscopy; Nuclear Magnetic Resonance Spectroscopy. (Total notional time: 180 hours)

MOLECULAR SPECTROSCOPY IV (MSP418P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Principles of Molecular Spectroscopy and Powder Diffraction; Interpretation of Spectra; Spectral Analysis of Organic and Polymer Molecules; Spectral Analysis of Inorganic Compounds and Minerals; and Industrial and Environmental Applications. (Total notional time: 180 hours)

MOTOR LEARNING AND HUMAN DEVELOPMENT I (MLH116P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module provides the student a fundamental understanding of how motor development affects motor learning. Students will be introduced to the individual functional and structural constraints present in childhood and adolescence in addition to the motor skills developed during childhood. The purpose of this module is to enable students to prepare, develop and implement developmentally appropriate movement programmes. (Total notional time: 60 hours)

MOTOR LEARNING AND HUMAN DEVELOPMENT I (MLH216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

The purpose of this module is to provide the student with a fundamental understanding of how motor development affects motor learning. A student will be introduced to the individual functional and structural constraints present in childhood and adolescence in addition to the motor skills developed during childhood. The purpose of this module is to enable him/her to prepare, develop and implement developmentally appropriate movement programmes. (Total notional time: 60 hours)

N

NATURAL RESOURCE AND ENVIRONMENTAL MANAGEMENT (NRE108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Sustainable development and integrated environmental management (part 1), and environmental assessment and management practice in South Africa (part 2). Upon completion, students will be able to solve complex problems related to selected environmental issues, such as but not limited to the conflict between environmental resource exploitation and environmental sustainability. The module is supportive of the purpose of the programme, which is to develop transdisciplinary thinking skills and applied research skills in working professionals, and to provide the student with an in-depth knowledge, practical skills and awareness in the field of Environmental Sciences, with particular emphasis on being able to lead a team involved in environmental assessment practice. (Total notional time: 180 hours)

NEUROLOGICAL AND PSYCHIATRIC PHARMACY (NPP448P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
An integrated study of the basic anatomy and physiology of the brain and nervous system. The module includes the pathophysiology of the major disorders affecting the central nervous system, with the emphasis on the pharmacology of appropriate therapeutic agents. Substance abuse, anaesthetics and pain management are also covered. (Total notional time: 240 hours)

NEUROMUSCULAR AND SKELETAL SYSTEMS, SKIN, INFLAMMATION AND PAIN MANAGEMENT (NSS347P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
An integrated study of the anatomy, physiology, pathophysiology and pharmacotherapy of the skeletal, neuromuscular systems and skin. The module also includes wounds and dressings. Emphasis is placed on the pharmacology of therapeutic agents used to treat disorders of these systems. (Total notional time: 210 hours)

NEURO-MUSCULOSKELETAL REHABILITATION I (NMR206P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student to have an elementary understanding of the interplay of pathomechanical and neuro-musculoskeletal injuries of the body. The student will be able to apply his/her knowledge to identify head, neck, shoulder, arm, wrist, chest, lower back, hip, knee, lower leg and foot injuries and prescribe elementary rehabilitation. (Total notional time: 120 hours)

NEURO-MUSCULOSKELETAL REHABILITATION II (NMR307B) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student to have a detailed understanding of the initial musculoskeletal evaluation process, goals, and principles in exercise rehabilitation. The student will be able to apply his/her knowledge of goals and principles in exercise-based rehabilitation. A detailed understanding of the initial assessment, goals, and principles in musculoskeletal exercise rehabilitation specific to joint and pathology/injury will be learnt. (Total notional time: 120 hours)

NEURO-MUSCULOSKELETAL REHABILITATION III (NMR408P) **PRACTICAL ASSESSMENT**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student to evaluate and prescribe individualised exercise programmes for multiple orthopaedic injuries. The student will be able to apply his/her knowledge of evaluation and prescription of exercise-based rehabilitation programmes for multiple orthopaedic injuries. The module will provide the students with a hands-on practical experience at the various biokinetic facilities. (Total notional time: 90 hours)

NUCLEAR TECHNOLOGY I (NCTH500) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Origin of penetrating radiation, radiation dosimetry, biological effects of radiation, nuclear physics instrumentation, external radiation protection, internal radiation protection, nuclear reactor physics, non-ionizing radiation, radiation protection guides, evaluation of protection measures, radiation protection management, radioactive waste management, transport of radioactive material. (Total notional time: 250 hours)

NUCLEAR TECHNOLOGY II (NCTH601) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
Nuclear reactor physics. Nuclear knowledge management, environmental monitoring, surveillance and dose assessment. Inspections and authorisations. Decommissioning of nuclear facilities. Radiation detection and monitoring equipment. Particle accelerators and applications. Radiation protection in medical applications. (Total notional time: 150 hours)

NURSING ETHOS AND PROFESSIONAL PRACTICE I (NRE115P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

The module prepares the student to demonstrate clinical judgement and critical thinking in terms of professional conduct. The student will be equipped with knowledge and skills related to areas of Nursing Ethos and Professional Practice, such as nursing as a profession, historical overview of nursing and midwifery, the nurse and midwife as professional practitioner, the legal framework for nursing and midwifery practice and the regulation of nursing and midwifery practice. Upon completion of this module, the student will be able to identify, explain, analyse and address contemporary matters in health and nursing by applying professional knowledge, skills and attitudes related to nursing and health ethics, law and professional practice. (Total notional time: 60 hours, consisting of 37.5 hours of instructional time and 22.5 hours of self-directed learning (including assessment time))

NURSING ETHOS AND PROFESSIONAL PRACTICE II (NRE216P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

This module prepares the student to demonstrate clinical judgement and critical thinking in terms of professional conduct. The student will be equipped with knowledge, skills and attitudes related to areas of Nursing Ethos and Professional Practice, such as nursing roles and maintenance of nursing standards in nursing and midwifery, patients' rights and responsibilities, nurses rights accountability and responsibility, advocacy, and duty to care. Upon completion of this module, the student will be able to identify, explain, analyse and address contemporary matters in health and nursing in an integrated manner by applying professional knowledge, skills and attitudes related nursing and midwifery and health ethics, law and professional practice. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time and 37.5 hours of self-directed learning (including assessment time))

NURSING ETHOS AND PROFESSIONAL PRACTICE III (NRE317P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

This module prepares the student to demonstrate clinical judgement and critical thinking in terms of professional conduct. The student will be equipped with knowledge and skills related to areas of Nursing Ethos and Professional Practice, such as ethical principles and decision-making, contemporary issues and ethical dilemmas in health care, macro-environmental influences on health care practices and professional relationships in health care practice. Upon completion of this module, the student will be able to identify, explain, analyse and address contemporary matters in health and nursing by applying professional knowledge, skills and attitudes related nursing and health ethics, law and professional practice. (Total notional time: 60 hours, consisting of 37.5 hours of instructional time and 22.5 hours of self-directed learning (including assessment time))

NURSING ETHOS AND PROFESSIONAL PRACTICE IV (NRE418P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

This module prepares the student to demonstrate clinical judgement and critical thinking in terms of professional conduct. The student will be equipped with knowledge and skills related to areas of Nursing Ethos and Professional Practice, such as current national policies in health, contemporary challenges, an ethical perspective on labour relations, nursing philosophies and theories and nursing and midwifery independent practice. Upon completion of this module, the student will be able to identify, explain, analyse and address contemporary matters in health and nursing in an integrated manner by applying professional knowledge, skills and attitudes related nursing and health ethics, law and professional practice. (Total notional time: 60 hours, consisting of 37.5 hours of instructional time and 22.5 hours of self-directed learning (including assessment time))

NURSING THEORY AND PRACTICE I (NTP105P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

The module prepares the student to function as a competent nurse practitioner. The student will be equipped with knowledge, skills, methods and techniques related to the needs of an individual, the family and community such as internal homeostasis, nutritional needs and first aid, which will enable the student to practice safe comprehensive clinical nursing care. Knowledge and skills will be imparted which are responsive to the needs of the individual's life span, the family and the community in accordance to national ethical – legal and policy framework. In addition, a student is prepared to address the global community's health needs. Upon completion of this module, the student will be able to reveal in-depth understanding, comprehensive explanations and application of the fundamentals of nursing. (Total notional time: 240 hours, consisting of 90 hours of instructional time, 30 hours of practical and 120 hours of self-directed learning (including assessment time))

NURSING THEORY AND PRACTICE II (NTP206P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

This module prepares the student to function as a competent nurse practitioner. The student will be equipped with knowledge, skills, methods and techniques related to the needs of an individual, the family and community such as the scientific process, conditions of body systems over the life-span, altered immunity and care of patients having surgery, which will enable the student to practice safe comprehensive clinical nursing care. Knowledge and skills will be imparted which are responsive to the needs of the individual's life span, the family and the community in accordance to national ethical-legal and policy framework. In addition, a student is prepared to address the global community's health needs. Upon completion of this module, the student will be able to reveal in-depth understanding, application and evaluation of the fundamentals of nursing. (Total notional time: 240 hours, consisting of 90 hours of instructional time, 44 hours of practical and 106 hours of self-directed learning (including assessment time))

NURSING THEORY AND PRACTICE III (NTP307P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

This module prepares the student to function as a competent nurse practitioner. The student will be equipped with the knowledge, skills, methods and techniques related to the needs of an individual, the family and community such as the reproductive, cardiovascular endocrine haematology and peripheral vascular system, These competencies will enable the student to practice safe comprehensive clinical nursing care. Knowledge and skills will be imparted which are responsive to the needs of the individual's life span, the family and the community in accordance to national ethical – legal and policy framework. In addition, a student is prepared to address the global community's health needs. At exit level of this module, the student will be able to revel in-depth understanding, comprehensive explanations and application of nursing theory and practice. (Total notional time: 240 hours, consisting of 90 hours of instructional time, 39 hours of practical and 111 hours of self-directed learning (including assessment time))

NURSING THEORY AND PRACTICE IV (NTP408P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

This module prepares the student to design, implement and adjust a nursing care plan for the individual, a group or community. The student needs to demonstrate competency through integrating the knowledge and skills related to the bodily systems. For example, a nursing care plan for a client/patient suffering from heart failure is designed, implement and adjusted to address the individual, family and the community's needs, throughout lifespan. This plan would include competencies related to pharmacology, mental health, and ethical and legal matters, already acquired during previous years of theoretical and practical learning. Upon completion of this module, the student will be able to analyse and evaluate the health needs of an individual's life span, the family and the community and implement and evaluate comprehensive nursing care in accordance to the needs. (Total notional time: 200 hours, consisting of 75 hours of instructional time, 18 hours of practical and 107 hours of self-directed learning (including assessment time))

NUTRITION I (NUT105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Hospitality Management)

Study of the chemical structure, metabolism and physiological functions of each nutrient, as well as the interaction of nutrients in the body. (Total notional time: 120 hours)

NUTRITION I (NUT105P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Hospitality Management)

An introduction to the core nutrients that are recommended to maintain good health, to ensure the application of appropriate nutritional knowledge in the design of training programmes and the provision of advice on nutrition, health and exercise. (Total notional time: 120 hours)

NUTRITION I (NUT305D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Hospitality Management)

An introduction of the core nutrients to students that is recommended to maintain good health, to ensure the application of appropriate nutritional knowledge in the design of training programmes and the provision of advice on nutrition, health and exercise. (Total notional time: 120 hours)

NUTRITION II (NUT206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Hospitality Management)

Application of basic nutritional knowledge gained in the first year regarding energy metabolism, planning of nutritionally balanced meals and the nutrition of specific age groups. Basic knowledge of the modification of the normal diet when planning therapeutic menus. (Total notional time: 120 hours)

NUTRITION III (NUT306D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Hospitality Management)

Factors influencing dietary patterns. Dietary habits of ethnic, religious and other groups in Southern Africa. Nutrition and the food industry. Consumer education. (Total notional time: 120 hours)

NUTRITION IV (NUT107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Hospitality Management)

Nutrition for oral and dental health; Consistency of modified diets; Carbohydrates and fat modified diets for malabsorption; Energy, fat and protein modified diets for diseases; Candidiasis; Nutrition and menopause; and Nutrition and skin health. (Total notional time: 120 hours)

NUTRITION AND GASTROENTEROLOGY (NAG145P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

An anatomical and physiological overview of the liver and gastro-intestinal tract and their innervation, with particular emphasis on the absorption and metabolism of nutrients and drugs. Major problems of nutrition and metabolic or chronic disorders in which nutrition plays a pivotal role will be addressed, including diabetes, obesity, eating disorders, malabsorption, alcohol abuse and pancreatitis. The identification of the presence of risk factors for malnutrition. The chemistry, pharmaceutics and pharmacology of drugs affecting the gastro-intestinal tract and drugs used to treat common GI problems. (Total notional time: 210 hours)

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OCCUPATIONAL HEALTH AND SAFETY (CHEMICAL AND BIOLOGICAL) III (OHS307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

The occupational hygiene process; occupational toxicology; epidemiological aspects and occupational health; hazardous chemical substances in the workplace; processes and hazardous chemical substances in the work place; occupational exposure limits; occupational medicine; indoor air quality; health risk assessments; measurement of hazardous chemical substances in the work place; quality aspects of occupational hygiene; occupational hygiene report writing; ethical and professional considerations; relevant legislation and standards as well as biological agents. (Total notional time: 220 hours)

OCCUPATIONAL HEALTH AND SAFETY (PHYSICAL) II (OHS206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Occupational safety; approved inspection authorities (AIA) for occupational hygiene services; history of health/hygiene; stress factors in the occupational environment; the occupational hygiene process; workplace ergonomics; ionising and non-ionising radiation; abnormal pressure; psychological work factors; occupational noise and vibration; thermal factors in the work place; illumination; relevant legislation, codes and standards. (Total notional time: 200 hours)

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT IV (OHS408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

The occupational hygiene process; health risk assessment; occupational health and safety services and activities; ethics, professionalism, quality; medical surveillance; health risk assessment; occupational hygiene monitoring; occupational health control principles; hierarchy of control; development and testing of control systems; occupational health and safety programmes; occupational health management principles; epidemiological aspect and occupational diseases; AIA facilities; health promotion at work relevant legislation and standards. (Total notional time: 200 hours)

OCCUPATIONAL RADIATION PROTECTION I (ORP107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Introductory nuclear physics; Dosimetry quantities, units and calculations; Biological effects of ionizing radiation; Principles of radiation protection; International framework and regulatory control; Assessment of internal and external exposure doses; Protection against occupational exposure; Exposure due to practices. (Total notional time: 180 hours)

OPTICAL DESIGN I (OPD107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Foundation of Geometrical Optics; Mirrors and prism systems; Imaging with a thin lens; Gaussian imagery; Object-Image relationships; Paraxial optics; Gaussian reduction; Paraxial raytracing; Stops and pupils; Radiative transfer; Vignetting. (Total notional time: 180 hours)

OPTICAL DESIGN II (OPD108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Introduction: Lens designer work; Meridional ray tracing; Paraxial rays and 1st order optics; Diffraction in optical systems; Basics of lens design; Systems of several lenses and thick lenses; Simple optical systems and photographic lenses; Complex photographic lenses; Visual, telescope systems and microscopes; and Lens design optimisation. (Total notional time: 180 hours)

ORAL ANATOMY AND PATHOLOGY I (OAP105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Anatomical landmarks in dentistry, salivary glands, muscles, blood and nerve supply, development of the face and oral cavity, oral microbiology, oral pathology, elementary pharmacology, clinical emergencies. (Total notional time: 200 hours)

ORAL ANATOMY AND TOOTH MORPHOLOGY (OAT105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Students are provided with the theoretical knowledge to understand the landmarks and anatomy during dental appliance manufacturing procedures and to prepare them to work as an employee in a dental laboratory. (Total notional time: 240 hours)

ORAL PHYSIOLOGY AND PATHOLOGY (OPH117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Theoretical knowledge of the functions of the body and the diseases of the mouth, jaws and related structures. This is a part requirement to be registered with the SADTC as a Dental Technologist entitling the student to be a laboratory owner, be an employer, and supervise a dental laboratory. (Total notional time: 60 hours)

ORGANIC CHEMISTRY IIA (OCA216X) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Naming of organic compounds according to IUPAC rules. Stereochemistry of organic compounds. Structure and reactivity of: Alkanes and cycloalkanes, Alkenes and Alkynes, Aromatic Compounds, Alkyl halides, Alcohols, Ethers and Epoxides, Aldehydes and ketones, Carboxylic acids and their derivatives, Amines. (Total notional time: 120 hours)

ORGANIC CHEMISTRY IIB (OCB216X) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Electrophilic aromatic substitution reactions. Nucleophilic aromatic substitution reactions. Carbonyl nucleophilic addition reactions. Alpha- substitution reactions. Carbonyl condensation reactions. Biomolecules. (Total notional time: 180 hours)

ORIENTATION AND INTRODUCTION TO THE PRACTICE OF PHARMACY IN SOUTH AFRICA (OPP145P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

This module introduces students to the institution, acquainting them with the administration, student and general organisations and campus layout. Personal development by prompting students' social skills, academic skills, computer literacy, proficiency in English. Introduce students to Problem-Based Learning (PBL) method. Provide an overview of the nature and ethos of the pharmacy profession. National Drug Policy, selection, procurement, distribution, cold chain management. Applicable legislation. Drug information and rational drug use. Essential Medicines List and treatment protocols. Medicines pricing. Ethics. Good Pharmacy practice. Interaction with other health-care professionals. (Total notional time: 210 hours)

ORTHODONTICS (ORD107V) **1 X 3-HOUR PAPER AND PRACTICAL ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Theoretical knowledge and practical skills required design and manufacture advanced dental appliances, and is a part requirement to be registered with the SADTC as a Dental Technologist entitling the student to be a laboratory owner, an employer, and supervise a dental laboratory. (Total notional time: 120 hours)

ORTHOPAEDIC PATHOLOGY (ORY307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student to be a forefront clinician with respectable ethical values with the ability to communicate appropriately with the inter-disciplinary team and identifying and treating the orthotic and prosthetic patient that is diagnosed with an orthopaedic disorder. The student will be able to apply his/her knowledge of orthopaedic disorders concerning Orthotic and Prosthetic patient by identifying, diagnosing treat and manage the orthopaedic disorder within our scope of practice. (Total notional time: 120 hours)

ORTHOTICS AND PROSTHETICS MATERIAL SCIENCES (OPT206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Discussions and reviews on orthotics and prosthetics materials, including metals, leather and wood relevant to the needs and requirements. The student will be able to differentiate and give examples of plastics and present knowledge and understanding of current and future developments in orthotics and prosthetics. (Total notional time: 120 hours)

ORTHOTICS AND PROSTHETICS PRACTICE I (OPC206P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student to apply all skills developed in Principles of Orthotics and Prosthetics, such as to measure, manufacture and fit lower limb Orthotic devices; Foot orthosis (FO), ankle orthosis (AO), ankle foot orthosis (AFO), knee orthosis (KO), knee, ankle foot orthosis (KAFO) hip, knee, ankle foot orthosis (HKAFO), and upper limb Prosthetic devices; Partial hand, wrist disarticulation (WD), trans radial (TR), elbow disarticulation (ED), trans humeral (TH), shoulder disarticulation (SD). (Total notional time: 260 hours)

ORTHOTICS AND PROSTHETICS PRACTICE II (OPC307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student to apply all skills developed in Orthotics and Prosthetics on NQF 6 and 7, to measure, manufacture and fit upper limb Orthotic devices; hand orthosis (HO), wrist hand orthosis (WHO), elbow orthosis (EO), shoulder orthosis (SO), lower limb Prosthetic devices; Trans-metatarsal, Lisfranc's, Chopart's, ankle disarticulation or Symes, trans tibial (TT), knee dis-articulation, long trans-femoral (TF), short trans-femoral (TF), hip disarticulation and hemipelvectomy. (Total notional time: 260 hours)

ORTHOTICS AND PROSTHETICS PRACTICE III (OPC408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student to be an independent practitioner in the industry of Orthotics and Prosthetics. The various aspects of this module deal with the clinical and practical part of the profession. The student is placed in industry during this time and a supervisor at the centre in liaison with the university will monitor and evaluate the progress of the student. This module will round off the student to be able to treat a patient in this field holistically and provide them with the appropriate assistive devices. The student will be able to apply his/her knowledge and practical skills to rehabilitate Orthotics and Prosthetic patients that were taught in the previous years. Practical skills will include the assessment, evaluation, designing, measuring, casting, manufacturing, fitting, problem-solving and issuing of the orthotic or prosthetic device. (Total notional time: 720 hours)

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PARASITOLOGY I (PSL215P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

This module introduces the student to the study of parasites such as parasitic worms, arthropods and protozoa, and their relationships with their hosts. The student will be imparted with knowledge, skills and professional values required in the field of medical parasitology to the extent that they can identify various parasites that infect humans and the diseases they cause. Upon completion of this module, the student will be equipped to understand, explain and discuss the biology of parasites and parasitic diseases, including the immunological responses, physiology, molecular biology, ecology and clinical aspects of parasites. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time, 14 hours of practical and 23.5 hours of self-directed learning (including assessment time))

PASTURE SCIENCE I (PAE115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

An informed understanding of natural and planted pastures for the nutrition of farm animals is important in livestock improvement. Students will acquire knowledge, skills and applied competencies in the following areas: Plant morphology, growth and development; Natural pastures; Plant nutrition and fertilisation; Pasture establishment and management; Fodder conservation; Environmental effects; Weeds and poisonous plants; Pasture production systems; applicable Acts and regulations; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 120 hours)

PATHOPHYSIOLOGY II (PTS206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to obtain detailed knowledge, apply problem-solving skills, as well as to produce and communicate information in the field of pathophysiology. The student will be able to apply his/her knowledge of Anatomy and Physiology to the disordered anatomical and physiological processes associated with disease or injury. The module includes: Introduction and Basic Concepts of Disease Process, Defence/ Protective Mechanisms, and Pathophysiology of Body Systems. (Total notional time: 180 hours)

PATHOPHYSIOLOGY III IN: CARDIOLOGY (CYP307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Pathophysiology in Cardiology and covers; congenital heart disease, diseases of the pericardium, ischaemic heart disease, valvular heart disease, heart failure, and cardiac arrhythmias. (Total notional time: 180 hours)

PATHOPHYSIOLOGY III IN: CARDIOVASCULAR PERFUSION (VAP307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Pathophysiology in Cardiovascular Perfusion and covers; congenital heart disease, diseases of the pericardium, ischaemic heart disease, valvular heart disease, heart failure, and cardiac arrhythmias. (Total notional time: 180 hours)

PATHOPHYSIOLOGY III IN: CRITICAL CARE (CCP307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Pathophysiology in Critical Care and covers the following systemic diseases; respiratory, cardiovascular, nervous, renal, and gastrointestinal, as well as multi-system disorders. (Total notional time: 180 hours)

PATHOPHYSIOLOGY III IN: NEPHROLOGY (NEP307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Pathophysiology in Nephrology and covers; acid-base, fluid, and electrolyte disorders, acute and chronic kidney disorders, glomerular diseases, systemic disorders and the kidney, and hereditary kidney disease. (Total notional time: 180 hours)

PATHOPHYSIOLOGY III IN: NEUROPHYSIOLOGY (NRP307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate knowledge of Pathophysiology in Neurophysiology and covers; epileptic seizures, disorders of consciousness, electroencephalographic pathologies, cranial nerve pathologies, spinal cord pathologies, and muscular pathologies. (Total notional time: 180 hours)

PATHOPHYSIOLOGY III IN: PULMONOLOGY (PLP307P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to integrate knowledge of Pathophysiology in Pulmonology and covers; obstructive airway diseases, restrictive airway diseases, vascular diseases, environmental, neoplastic, and infectious diseases, respiratory failure, intrapulmonary shunting. (Total notional time: 180 hours)

PATHOPHYSIOLOGY III IN: REPRODUCTIVE BIOLOGY (RBP307P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to integrate knowledge of Pathophysiology in Reproductive Biology and covers; infectious disease, infectious sampling, sperm DNA damage and genetics, male congenital abnormalities. (Total notional time: 180 hours)

PATHOPHYSIOLOGY IV (PTS418P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to apply his/her specialised knowledge of Anatomy, Physiology, and Pathophysiology to the disordered anatomical and physiological processes associated with disease or injury in special populations (paediatrics, adolescent, aged, immobile) as well as specialised pathologies in the field of specialisation. This module will prepare the student to integrated knowledge and prepare them for engagement in the field of specialisation at the forefront of Clinical Technology. (Total notional time: 120 hours)

PETROLOGY (PEG206D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Environmental, Water and Earth Sciences)
Introduction to igneous petrology. Classification of igneous rocks. Igneous rocks textures and structures. Volcanic rocks in South Africa. Igneous rocks hand specimen identification and fieldwork. Metamorphic petrology. Contact metamorphism. Regional metamorphism. Organically formed sedimentary rocks. Summary of Petrology module. The module will further examine petrography of all rock types through practical sessions. (Total notional time: 120 hours)

PHARMACOLOGY (PMY315P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Pharmaceutical Sciences)
This module introduces the student to pharmacological principles and concepts related to drug administration, drug scheduling, legal aspects and drug allergies. Upon completion, the student will be able to demonstrate the basic competencies such as drug calculation, application of drug abbreviations and the listing of common drug side- and adverse effects and the supplication of the ethical and legal aspects, concerning nursing and midwifery. (Total notional time: 60 hours)

PHARMACOLOGY IN NURSING III: MIDWIFERY AND SPECIFICS (PMF317P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to demonstrate integrated knowledge of the pharmacological principles of drugs such as analgesics, antihistamines and drugs used during pregnancy, labour, post-partum, related midwifery conditions and the neonate. Upon completion of the module, the student will be able to apply and demonstrate the relevant competencies, including the application of appropriate guidelines, concerning pharmacology in nursing and midwifery. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time and 37.5 hours of self-directed learning (including assessment time))

PHARMACOLOGY IN NURSING IV: DISPENSING (PDS418P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to demonstrate integrated knowledge of the pharmacological principles of drugs. Upon completion of the module, the student will be able to apply and demonstrate the relevant competencies, including the application of appropriate guidelines, concerning pharmacology in common cardiovascular, respiratory, endocrine and central nervous system diseases or conditions. These competencies will be applied considering the personal and professional ethics of nursing and midwifery. (Total notional time: 120 hours, consisting of 45 hours of instructional time, 20 hours of practical and 55 hours of self-directed learning (including assessment time))

PHARMACEUTICAL DEVELOPMENT PROCESS (PHD107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
The steps in the Pharmaceutical Development Process of a drug into a pharmaceutical dosage form. The stages of preformulation, characterisation of the active pharmaceutical ingredient, the design and formulation of an appropriate dosage form and briefly the manufacturing process, record keeping, packaging and stability aspects. Various dosage forms, advantages, disadvantages, routes of administration, formulation development and rationale for choice of excipients, specifications, official and legal requirements for active pharmaceutical ingredients, excipients and finished products, manufacturing requirements specific to each dosage form. (Total notional time: 240 hours)

PHARMACOLOGY II (PMY206P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to acquire an informed understanding of the basic principles of pharmacology, common organ system conditions and their treatment. The student will be able to demonstrate the ability to select and apply the correct pharmacological agents for the appropriate disease profile. Through this module, students will obtain the ability to integrate aspects of anatomy, physiology, pathophysiology and pharmacology in their field of study. Relevance of pharmacology is in line with national clinical needs and biomedical professional policies and procedures, and suitable resources need to be critically evaluated and used to facilitate the pharmacology as a speciality on postgraduate level. (Total notional time: 180 hours)

PHARMACOLOGY III IN: CARDIOLOGY (CYH317P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to acquire an informed understanding of the basic principles of pharmacology in cardiology, common cardiovascular conditions and their treatment. The student will be able to demonstrate the ability to select and apply the correct pharmacological agents for the appropriate disease profile. Through this module, students will obtain the ability to integrate aspects of anatomy, physiology, pathophysiology and pharmacology in their field of study. Relevance of pharmacology in cardiology is in line with national clinical needs and health professional policies and procedures, and suitable resources need to be critically evaluated and used to facilitate cardiology as a speciality. (Total notional time: 60 hours)

PHARMACOLOGY III IN: CARDIOVASCULAR PERFUSION (VAH317P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to acquire an integrated knowledge and understanding of facts and principles related to the pharmacology in Cardiovascular Perfusion. The module content entails common cardiovascular conditions and their management. The student will be able to demonstrate the ability to select and apply the correct pharmacological agents for the appropriate disease profile. Through this module, students will obtain the ability to integrate aspects of human anatomy, human physiology, pathophysiology and pharmacology in this field of study. Relevance of pharmacology in cardiovascular perfusion is in line with national clinical needs and health professional policies and procedures, and suitable resources need to be critically evaluated and used to facilitate cardiovascular perfusion as a speciality. (Total notional time: 60 hours)

PHARMACOLOGY III IN: CRITICAL CARE (CCH317P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to acquire an informed understanding of the basic principles of pharmacology in critical care, common critical care conditions and their treatment. The student will be able to demonstrate the ability to select and apply the correct pharmacological agents for the appropriate disease profile. Through this module, students will obtain the ability to integrate aspects of anatomy, physiology, pathophysiology and pharmacology in their field of study. Relevance of pharmacology in critical care is in line with national clinical needs and health professional policies and procedures, and suitable resources need to be critically evaluated and used to facilitate critical care as a speciality. (Total notional time: 60 hours)

PHARMACOLOGY III IN: NEPHROLOGY (NEH317P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to acquire an informed understanding of the basic principles of pharmacology in nephrology, common nephrology conditions and their treatment. The student will be able to demonstrate the ability to select and apply the correct pharmacological agents for the appropriate disease profile. Through this module, students will obtain the ability to integrate aspects of anatomy, physiology, pathophysiology and pharmacology in their field of study. Relevance of pharmacology in nephrology is in line with national clinical needs and health professional policies and procedures, and suitable resources need to be critically evaluated and used to facilitate nephrology as a speciality. (Total notional time: 60 hours)

PHARMACOLOGY III IN: NEUROPHYSIOLOGY (NRH317P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to acquire an informed understanding of the basic principles of pharmacology in Neurophysiology, common Neurophysiology conditions and their treatment. The student will be able to demonstrate the ability to select and apply the correct pharmacological agents for the appropriate disease profile. Through this module, students will obtain the ability to integrate aspects of anatomy, physiology, pathophysiology and pharmacology in their field of study. Relevance of pharmacology in Neurophysiology is in line with national clinical needs and heath professional policies and procedures, and suitable resources need to be critically evaluated and used to facilitate Neurophysiology as a speciality. (Total notional time: 60 hours)

PHARMACOLOGY III IN: PULMONOLOGY (PLH317P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to acquire an informed understanding of the basic principles of pharmacology in pulmonology, common pulmonology conditions and their treatment. The student will be able to demonstrate the ability to select and apply the correct pharmacological agents for the appropriate disease profile. Through this module, students will obtain the ability to integrate aspects of anatomy, physiology, pathophysiology and pharmacology in their field of study. Relevance of pharmacology in pulmonology is in line with national clinical needs and health professional policies and procedures, and suitable resources need to be critically evaluated and used to facilitate pulmonology as a speciality. (Total notional time: 60 hours)

PHARMACOLOGY III IN: REPRODUCTIVE BIOLOGY (RBH317P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to acquire an informed understanding of the basic principles of pharmacology in Reproductive Biology, common Reproductive Biology conditions and their treatment. The student will be able to demonstrate the ability to select and apply the correct pharmacological agents for the appropriate disease profile. Through this module, students will obtain the ability to integrate aspects of anatomy, physiology, pathophysiology and pharmacology in their field of study. Relevance of pharmacology in Reproductive Biology is in line with national clinical needs and health professional policies and procedures, and suitable resources need to be critically evaluated and used to facilitate Reproductive Biology as a speciality. (Total notional time: 60 hours)

PSYCHOSOCIAL SCIENCE (PSY206P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student to apply knowledge, skills and attitudes in psychology to effectively, and professionally interact with individuals, families and communities, throughout their life span, in a variety of work, therapeutic and health care settings. The students will be able to apply their knowledge of the bio-psychological basis for human behaviour, human development, personality, language and through, learning and memory, intelligence, motivation and emotion, social behaviour, stress, coping and health. (Total notional time: 120 hours)

PHYSICAL CHEMISTRY (PHC118G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Chemistry)
Statistical thermodynamics. Kinetics of complex reactions. Crystallography. (Total notional time: 150 hours)

PHYSICAL CHEMISTRY IIA (PCA216X) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemistry)
States of Matter, gas laws and kinetic model of gases. Molecular speeds, kinetic energy, pressure, temperature, volumes and amount of substance. Unit Conversions. Calculations used in Physical Chemistry. Intermolecular forces, vapour pressure, boiling and melting points of substances. Surface Tension, Viscosity and Capillarity. Concentration of solutions. Vapor pressure difference, boiling point elevation, melting point depression and Osmotic pressure. Phase diagram and Phase changes. Colloids. Chemical Kinetics. Chemical Equilibria. Chemical Thermodynamics. (Total notional time: 120 hours)

PHYSICAL CHEMISTRY IIB (PCB216X) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemistry)
Chemical Thermodynamics. Phase Changes. Electrochemistry. Chemical Kinetics. Quantum Chemistry Surface Chemistry. (Total notional time: 180 hours)

PHYSICAL CHEMISTRY III (PCH317P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Surface Chemistry: physical and chemical behaviour of surfaces including interfaces such the solid-gas interface, liquid interface; Electrochemistry: electrical properties of interfaces, liquid interface, polarized and non-polarised electrode surfaces and their applications. (Total notional time: 120 hours)

PHYSICAL CHEMISTRY IV (PCH418P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Statistical Thermodynamics: thermodynamic properties of macroscopic systems from microscopic constituents; energy, entropy and temperature per average atom; statistical postulates of quantum mechanics; molecular interpretation to describe heat capacity, entropy, internal energy, Gibbs free energy; Kinetics of complex reactions: reactions approaching equilibrium; the Arrhenius equation; Lindemann-Hinshelwood mechanism; the RRK (Rice-Ramsperger-Kassel) model; the Rice-Herzfeld mechanism; catalysis. (Total notional time: 120 hours)

PHYSICS I (PHI105X) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Basic Mathematical Concepts for Physics and measurements. Kinematics in one dimension. Kinematics in a plane (projectile motion). Forces and Newton's Laws of Motion. Momentum and Impulse. Work, Energy and Power. Rotational Kinematics. Rotational Dynamics. Elasticity. Static and dynamic fluids. Temperature and 0th Law of Thermodynamics. Thermal Expansion and Thermal Stress. First Law of Thermodynamics. Heat transfer. Gas Laws. General properties of waves. Reflection. Refraction. Interference and Diffraction of waves. Electrostatics. Electric Potential Energy and Potential Difference. Electric Circuits. (Total notional time:240 hours)

PHYSICS I (PHY105P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Introduction to physics; basic mathematics for physics; measurements; motion in one dimension; forces and Newton's laws of motion; work and energy; impulse and momentum; rotational dynamics; fluids; temperature, heat and heat transfer; ideal gas law and kinetic theory; waves and sound; optics; electricity; nuclear physics and radioactivity. (Total notional time: 200 hours)

PHYSICS FOR HEALTH SCIENCES (PHN115P) **1 X 3-HOUR PAPER**
PHYSICS FOR HEALTH SCIENCES I (PHS115P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

This module is aimed at enhancing student knowledge in fundamental concepts in mechanics, mechanical properties of fluids, thermal properties of matter, general and geometrical properties of waves, static electricity and electric circuits and their applications thereof. (Total notional time: 120 hours)

PHOTONICS I (PTNH500) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Photonics Safety. Polarisation of light. Absorption and scattering of light. Basics of laser operation theory. Laser systems. Principles of fibre optics. Thin film coating. (Total notional time: 250 hours)

PHOTONICS II (PTNH601) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Solid-state lasers. Frequency multiplication of laser beams. Manufacturing photonics components and semi-conductor elements. Optical systems. (Total notional time: 150 hours)

PHOTOVOLTAIC TECHNOLOGY (PHO118G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Solar cell and PV modules; Current-voltage characterisation; PV system components; and PV system simulation. (Total notional time: 120 hours)

PIG PRODUCTION II (VPA206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students will acquire detailed knowledge, skills and applied competencies in areas such as: Pig Industry and Pig Performance and Improvement Schemes; Evaluation of pig breeds; Pig breeding plans, genetic evaluation and judging pigs for functional efficiency; Reproductive system; Production management of pigs; Nutritional practices in pigs; Pig handling equipment and housing; Pig diseases and disease control; Pork and products classification and marketing; applicable Acts and regulations; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 240 hours)

PLANNING FOR BUILT ENVIRONMENT II (PBE206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Town planning - aim of city planning, origin of towns and cities, limitations of town planning, the land-use question, the problems that manifest in the city environment, the intra-urban structure, ecological land-use planning, internal structure of the city; housing - concepts of housing and a house, inherent socio-economic challenges, general housing principles in terms of world health organisation, consideration of residential planning, role of ethics in housing development; building science - design of buildings, building plans, building styles, types of finishes of materials, building construction and building materials, foundations, national building regulations act); the role of environmental health practitioners and authorities in town planning, housing and building science. (Total notional time: 150 hours)

PLANT STUDIES I (PSU105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Introduction to the discipline of botany, botanical terminology, plant morphology, anatomy and physiology. Knowledge, skills and applied competencies in areas such as, but not limited to Botanical Taxonomy and Systematics, Plant Cytology, and Plant Physiology and Organography. (Total notional time: 240 hours)

PLANT STUDIES II (1SU206D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Horticulture)

Plant classification, definitions and terminology: Annuals and perennials. Geophytes. Groundcovers and climbers. Succulents. Ornamental grasses, reeds and sedges. Herbs and medicinal plants. Shrubs. Trees (fruit and ornamental). Vegetables (exotic and traditional). (Total notional time: 240 hours)

PLANT STUDIES II (PSU206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module introduces concepts and techniques related to vegetation monitoring and veld management in protected areas. Introduction to plant identification, vegetation sampling techniques, floristic parameters measured in the field, field data collection protocols, and management of plant species of interest. Detailed knowledge of the main areas of the discipline, including an understanding of, and an ability to apply, the key terms, concepts, facts, principles, rules and theories of the discipline to unfamiliar but relevant contexts, and knowledge of areas of specialisation. (Total notional time: 240 hours)

PLANT STUDIES III (1SU316D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Horticulture)

Functional uses of plants. Visual uses of plants. Plants for specific uses. Plant groupings. Plant biodiversity and habitat development. (Total notional time: 180 hours)

PLANT STUDIES III (PSU107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Biomes and the history of veld management and vegetation description in South Africa. Plant communities, phytosociology, and vegetation classification and mapping. Floristic parameters measured in the field, vegetation sampling, field measurement techniques and field data collection for vegetation monitoring. This is an integrated fundamental module aligned with a detailed body of knowledge, in articulation with the specific field of Nature Conservation and serves to resolve problems and introduce change within the area of Vegetation Science, Phytosociology and Plant Classification. (Total notional time: 240 hours)

PLANT STUDIES IV (PSU108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

The module deals with veld management, natural rangelands and related problems, veld condition, vegetation monitoring and adaptive management aspects in comprehensive detail. The focus is on vegetation classification recap and description at different scales, natural rangeland and related problems, veld condition, vegetation monitoring and adaptive management principles, the concept of carrying capacity, management of fires in wildlife areas, the control and management of problem plants in wildlife areas, the management of veld restoration and improvement and the management of veld replacement (cultivated pastures). (Total notional time: 240 hours)

POST-HARVEST TECHNOLOGY (PHA117V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Crop Sciences)

Fundamental knowledge of postharvest losses; Basic fruit and vegetable physiology and nutrition; Pre-harvest factors, maturity indices, and harvesting; Packhouse operation, precooling, and packaging; Ripening and degreening; Quality assurance and cold chain management; Refrigerated transport and retail shelf. (Total notional time: 120 hours)

POSTGRADUATE RESEARCH PROJECT (PBI108G, PBI118R) **PROJECT ASSESSMENT**

(Module custodian: Department of Biotechnology and Food Technology)

This module strengthens and deepens the range of skills and knowledge needed for research. The scope of knowledge within this module includes (but not limited to): The application of research statistics; Report writing skills; Laboratory methods; Time management; Ethics; and Research methodology to develop advanced reflection and critical thinking skills by applying and practicing research methods relevant to this field of study. (Total notional time: 240 hours)

POSTGRADUATE RESEARCH PROJECT (PCP108G, PCP118R) **PROJECT ASSESSMENT**

(Module custodian: Department of Crop Sciences)

This module will provide the student with the ability to perform a pilot project on a small scale to prepare the student for a full-scale research project when advancing to the Master of Agricultural Sciences: Identify and plan a research project, write a research proposal, do an oral presentation of proposal, execute a pilot study as planning for a Master's degree, write a final research report, and do an oral presentation of final report. (Total notional time: 240 hours)

POULTRY PRODUCTION II (PDN206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students will acquire detailed knowledge, skills and applied competencies in areas such as: Poultry industry and the Poultry Improvement Programmes; Evaluation of poultry breeds; Poultry breeding plans and genetic evaluation; Reproductive system, production management of poultry; Poultry nutrition; Poultry farm planning and housing systems; Poultry health and disease control and Strategic planning and marketing of poultry products; applicable Acts and regulations; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 240 hours)

PRIMARY HEALTH CARE WORK-BASED LEARNING (PHL246P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

Practical experience in aspects of pharmaceutical and related services at Primary Health Care level. (Total notional time: 180 hours)

PRINCIPLES AND PRACTICE OF PHARMACEUTICAL MANUFACTURING: MEDICINES PRODUCTION ON THE LARGE SCALE (PPP246P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

An overview of the manufacturing of pharmaceuticals. Physical, chemical and pharmaceutical principles in the production, packaging and labelling of pharmaceutical products. (Total notional time: 180 hours)

PRINCIPLES OF ORTHOTICS AND PROSTHETICS I (POP105P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Basic principle of orthotics and prosthetics; Health Profession Council of South Africa and Ethics; and Current and Innovative technologies in orthotics and prosthetics. (Total notional time: 120 hours)

PRINCIPLES OF ORTHOTICS AND PROSTHETICS IV (POP408P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module allows the student to conduct a basic research project approved by the ethics committee. The student will be able to gather and analyse the data within his/her practical placements. (Total notional time: 360 hours)

PRINCIPLES OF ORTHOTICS II (POT206P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student to be a forefront clinician with respectable ethical values with the ability to communicate appropriately with the inter-disciplinary team and treating the orthotic patient. The student will be able to apply his/her knowledge of Orthotic protocols towards the patients' management and lower extremity orthotics to conduct a successful treatment/rehabilitation plan as well as manufacturing of these rehabilitative devices. (Total notional time: 140 hours)

PRINCIPLES OF ORTHOTICS III (POT307P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module provides the student with the knowledge and skills to deal with all patients with head, trunk and upper limb deficiencies that require orthotic intervention. The student will be able to apply his/her knowledge in order to provide the care and understanding to diagnose and recognise the scientific procedures needed to be followed in order to effectively manage the orthotic client in all aspects of rehabilitation and the manufacturing of the correct orthotic device. (Total notional time: 200 hours)

PRINCIPLES OF PROSTHETICS II (POU206P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module in prepares the student to be a forefront clinician with respectable ethical values with the ability to communicate appropriately with the inter-disciplinary team and treating the upper limb and breast prosthetic patient. The student will be able to apply his/her knowledge of Prosthetic Clients, Prosthetic patient management and Upper extremity prosthetics including breast prosthetics, to assess, measure and design a successful treatment/rehabilitation plan including the manufacturing and issuing of the assistive device. (Total notional time: 140 hours)

PRINCIPLES OF PROSTHETICS III (POU307P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student to deal with all patients with lower limb amputations. The student will be able to apply his/her knowledge of Foot, Symes, Trans-Tibial, Through Knee, Trans-Femoral and Hemi-pelvectomy patients providing the care and understanding to diagnose and recognise the scientific procedures applicable. The student will be able to apply his/her knowledge of Prosthetic Clients, Prosthetic patient management and Lower extremity prosthetics to design a successful treatment/rehabilitation plan including the manufacturing and issuing of the assistive device. (Total notional time: 200 hours)

PROCESS CONTROL III (PCL317P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemical, Metallurgical and Materials Engineering)
Introduction to process control; Control incentives and strategies; Controller principles and Control modes; Process instrumentation; and application and analysis of process instrumentation. (Total notional time: 180 hours)

PROCESS TECHNOLOGY AND MANAGEMENT I (PEM216D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biotechnology and Food Technology)
Units, dimensions and definitions. Material balances. Energy and Energy balances. Steam and Steam tables. Psychrometrics. Fluid flow and properties. (Total notional time: 120 hours)

PROFESSIONAL PRACTICE IN FIRE TECHNOLOGY INVESTIGATIONS (FTI108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Physics)
Knowledge and skills to submit a written fire origin and cause report that will stand up in court as part of expert witness testimony. Effective investigation and testimony; documenting the event; fire investigation for fire officers; fundamentals of interviewing; fire flow analysis and compile a comprehensive scientific fire investigation report. (Total notional time: 180 hours)

PROFESSIONAL STANDARDS AND ETHICS (PSE418P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student within the field of Biokinetics to implement and manage health policy, health systems, and structures, capacity building and interdisciplinary healthcare as required in South African legislation. Apply basic management functions and competencies in private and public Biokinetics practice/health care facility contexts. The module should enable the student to apply relevant knowledge and understanding of the scope of practice and ethical rules concerning Biokinetics. To be able to apply entrepreneurial skills in establishing and managing a Biokinetics practice. The student should also demonstrate a systematic knowledge base and implementation skills of health related ethical and legal aspects within the profession of Biokinetics. This module equips students to implement public health policies, relevant legislative obligations, general practices according to human rights principles and the constitution. Students should also be able to manage the practice/facility with due consideration for and in collaboration/conjunction with policy makers. (Total notional time: 60 hours)

PROSTHETICS (PSH107V) **1 X 3-HOUR PAPER AND PRACTICAL ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Theoretical knowledge and practical skills required to design and manufacture fully balanced functional upper- and lower dentures and other advanced dental appliances. It is a part requirement to be registered with the SADTC as a Dental Technologist entitling the student to be a laboratory owner, an employer, and supervise a dental laboratory. (Total notional time: 180 hours)

PSYCHOLOGY: EMERGENCY SERVICES II (PES117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

Health care system; The health care professionalism; Developmental psychology; Understanding abnormal behaviour; Understanding the concept of pain; Understanding phases of life; and Stress and approaches to the study of stress. (Total notional time: 180 hours)

PSYCHO-SOCIAL SCIENCES I (PSS205D, PSS206P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

The purpose of this module is to prepare the student to apply knowledge, skills and attitudes in psychology to effectively, and professionally interact with individuals, families and communities, throughout their life span, in a variety of work, therapeutic and health care settings. A student will be able to apply his/her knowledge of the bio-psychological basis for human behaviour, human development, personality, language and through, learning and memory, intelligence, motivation and emotion, social behaviour, stress, coping and health, professional and therapeutic relationships to personal and professional relationship. Upon completion of the module, the student will be able to understand and apply the psychological perspectives to the in the field of kinesiology and coaching science. (Total notional time: 120 hours)

PSYCHO-SOCIAL SCIENCE II (PSS306P, PSS307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Adelaide Tambo School of Nursing Science)

This module prepares the student to apply knowledge of psycho-social sciences, throughout the life span, in a variety of work environments, therapeutic and health care settings and communities in response to population needs. The student will be able to apply his/her knowledge of the sociological perspectives, culture, religion, socialisation and social identity, family, race, class, gender, South African Population demographics, Social problems and their societal implications. On completion, the student will be able to understand and apply the sociological perspectives to the health promotion, prevention, treatment and rehabilitation in the world of work and health service delivery. (Total notional time: 120 hours, consisting of 45 hours of instructional time, 20 hours of practical and 55 hours of self-directed learning (including assessment time))

Q

QUALITY AND SAFETY MANAGEMENT SYSTEMS (QSM117V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biotechnology and Food Technology)

Overview of relevant ISO and SANAS standards; Occupational Health and Safety (OHSAS 18001); regulations and legislation; HACCP/Codex principles; and audit principles and practice. (Total notional time: 120 hours)

QUALITY AUDITING TECHNIQUES (QAT117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Development of ISO 19011, Auditing Integrated management systems, Auditor competency and auditor qualifications, Auditing Terms and Definitions, Principles of auditing, Managing an audit programme, Types and levels of audits, Audit planning and budgeting, Establishing the audit scope and objectives, The roles of audit team members, Establishing an audit programme, The process approach, Planning, preparing and conducting document review, Planning and preparing the audit documentation, Conducting the audit and recording findings, Preparing the audit report, Attributes of the auditor, Roles of the auditor and auditee, Maintaining and improving auditor competence, and preparing and conducting follow-up audits. (Total notional time: 120 hours)

QUALITY IMPROVEMENT TECHNIQUES (CQI) (QIT108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Quality in an organisational context; Management functions: planning, organising, directing and control; The quality planning process; The quality product life cycle and Juran Trilogy; Design for quality and Quality Leadership; Process approach and P-D-C-A; Process mapping tools; Process review tools and techniques; Gap analyses and CPA (critical path analyses); Establishing process monitoring and review methods and metrics; Systematic approach to problem-solving; The breakthrough process; Servqual-model; Self-assessment models for improvement; Innovation for improvement; and Managing organisational change. (Total notional time: 240 hours)

QUALITY MANAGEMENT SYSTEMS (QMA107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Origins of the ISO, History and development of ISO 9000 family of Standards. ISO High level structure (HLS) for International Standards, Types of Standards and scope of application, Overview of ISO 10000 series of Standards, Scope of ISO 9000. Standard ISO 9000. Fundamentals of Quality, ISO 90000 Quality Principles, ISO 9000 Quality definitions. Scope of ISO 9001, The process approach, Conformance clauses and text analyses from ISO 9001, Overview ISO 10004 Customer satisfaction guidelines, ISO/TS 16949 Overview and additional requirements, ISO 17025 Requirements for Laboratories, ISO 14000 Environmental Management System, ISO 18000+ISO18001 OSHAS, ISO 22000 Food Safety Management System. ISO 19011 Auditing Guidelines; Overview, ISO 9004 Managing Sustained Success. (Total notional time: 240 hours)

QUALITY OF MEDICINES (QMD107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

A wide range of topics associated with quality assurance, good manufacturing practices, quality control, validation, design and control of the manufacturing environment, including manufacturing procedures, documentation, raw materials, human resources and facilities and equipment for manufacturing of pharmaceutical products. Appropriate processes of information gathering within the field of drug development process and good manufacturing practices in order to produce quality medicinal products. Compliance with current Good Manufacturing Practices (cGMP). Differences between GMP, QA, and QC in pharmaceutical manufacturing. (Total notional time: 240 hours)

QUANTUM AND SOLID STATE PHYSICS II (QSS118G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

The time-independent Schrodinger Equation; Quantum mechanics in three dimensions; Identical particles, Crystallography; and Solid-state electronics: energy bands in crystals, carrier concentrations, mobility and conductivity, the p-n junction, semiconductor-metal junctions. (Total notional time: 120 hours)

R

RADIATION PHYSICS, PROTECTION, AND DIAGNOSTIC IMAGING EQUIPMENT II (RDQ206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

This module enables the student to apply his/her knowledge to recall and demonstrate an understanding of the major learning fields of general physics, radiation physics, electricity, basic physics of ultrasound, basic physics of MRI, physics of radiography and radiation safety and protection. (Total notional time: 240 hours)

RADIATION PROTECTION DOSIMETRY I (RPD107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Radiation-matter interactions; Ionising radiation in biological matter; Radiation detectors; Radiation dosimetry; Counting statistics and measurement uncertainty; Calibration of dosimeters; Non-ionising radiation; Non-ionising radiation protection dosimetry. (Total notional time: 240 hours)

RADIATION PROTECTION DOSIMETRY II (RPD108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Radiation-matter interactions; Ionising radiation in biological matter; Internal radiation dose assessment; Environmental radiation dosimetry; Occupational radiation dosimetry; and Non-ionising radiation and dosimetry. (Total notional time: 120 hours)

RADIOGRAPHIC IMAGING I (RDI105P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire, apply and demonstrate radiographic knowledge to ultimately become professional, competent radiographer who is able to work in a multi-disciplinary health environment. The student will be able to apply his/her knowledge and understanding of the fundamental aspects of analogue image formation, cassettes, films and intensifying screens, as well as chemical processing. Furthermore, the student will gain knowledge and understanding of image quality and image critique, digital image formation modalities, as well as basic research and computer literacy, within a simulated radiography environment in the radiography skills centre. (Total notional time: 120 hours)

RADIOGRAPHIC IMAGING II (RDI206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to apply, integrate, and demonstrate basic knowledge, skills and applicable attitudes to a range of advanced imaging modalities and associated advanced technology in the field of Diagnostic Radiography, to be able to understand the process of image formation at this level and also required for the student to become a skilled qualified diagnostic radiographer who can work independently in a multi-disciplinary health environment. (Total notional time: 180 hours)

RADIOGRAPHIC IMAGING III (RDI307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to apply, integrate, and demonstrate in-depth knowledge, skills and applicable attitudes to a range of advanced imaging modalities and associated advanced technology in the field of Diagnostic Radiography, to be able to independently work on the latest developments of technology such as clinical information system (CIS). (Total notional time: 240 hours)

RADIOGRAPHIC IMAGING IV (RDI408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to apply, integrate, and demonstrate in depth forefront knowledge, skills and applicable attitudes to a range of advanced imaging modalities and associated advanced technology in the field of Diagnostic Radiography, to be able to operate specified specialised digital radiography equipment required at this level and also required for the student to become a highly skilled and qualified diagnostic radiographer who can work independently in a multi-disciplinary health environment. (Total notional time: 120 hours)

RADIOGRAPHIC PATHOLOGY II (RPY206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire detailed knowledge of general pathology, as well as a wide range of pathologies with associated radiographic patterns as found in the respiratory-, skeletal-, gastrointestinal-and urinary systems. Furthermore, the student will acquire detailed knowledge of the diagnostic value of specialised imaging modalities and the imaging modality of choice to demonstrate specific disease processes. The student will be able to apply his/her knowledge of Radiographic Pathology in the field of Diagnostic Radiography. (Total notional time: 180 hours)

RADIOGRAPHIC PATHOLOGY III (RPY307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire integrated knowledge of a wide range of pathologies with associated radiographic patterns, as found in the Cardiovascular-, Nervous-, Endocrine-, Reproductive- and Hematopoietic Systems. Furthermore, the student will acquire integrated knowledge of specific internal devices. The student will be able to apply his/her knowledge of Radiographic Pathology in the field of Diagnostic Radiography. (Total notional time: 120 hours)

RADIOGRAPHIC PRACTICE I (RPT105P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to integrate basic radiographic knowledge to ultimately become professional, competent radiographer who is able to work in a multi-disciplinary health environment. The student will be able to apply his/her knowledge of the medication and infection control aspects; radiographic terminology and radiation protection; basic radiographic positioning of the skeleton and respiratory system; the principles of mobile and intra-operative radiography within simulated environments. (Total notional time: 120 hours)

RADIOGRAPHIC PRACTICE II (RPT206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate detailed radiographic knowledge of radiation effects and protection; specialised radiographic technique of the skeleton and body systems; fluoroscopy; contrast medium and the emergency procedure; contrast medium examinations; mobile and intraoperative examinations; other miscellaneous radiographic examinations, and ultimately become professional, competent radiographer who is able to work in a multi-disciplinary health environment. The student will be able to apply his/her knowledge of Radiographic Practice within simulated and familiar clinical environments. (Total notional time: 240 hours)

RADIOGRAPHIC PRACTICE III (RPT307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to attain, apply and integrate specialised radiographic knowledge to ultimately become professional, competent radiographer who is able to work in a multi-disciplinary health environment. The student will be able to apply and integrate his/her knowledge of Anatomy, Physiology, Advanced Pathology, Pattern Recognition, basic research and computer literacy, as well as specific knowledge regarding specialised skull radiography, paediatrics. Computerised Tomography (CT) and specialised contrast media procedures such as Sialography, Dacrocystography, Sinography, etc. In addition, integrated knowledge regarding other modalities will be obtained including Magnetic Resonance Imaging (MRI), Ultrasound, Nuclear Medicine and Radiation Oncology, as experienced in the clinical radiography environment. (Total notional time: 240 hours)

RADIOGRAPHIC PRACTICE IV (RPT408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire, apply, integrate, and demonstrate in depth forefront knowledge of a range of advanced imaging modalities, including Computerised Tomography, Angiography and Interventional Procedures and Ultrasound, as well as associated advanced technology in the field of Diagnostic Radiography, which are required at this level and also required for the student to become a highly skilled and qualified diagnostic radiographer who can work independently. (Total notional time: 240 hours)

RADIOMETRY AND PHOTOMETRY (RPB117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Fundamental concepts of radiometry; Fundamental concepts of photometry; Black bodies and other sources; Source/receiver flux transfer calculations; Optical properties of materials; Detection of radiation; Radiometers and photometers; Basic concepts of Colour Science. (Total notional time: 120 hours)

RANGELAND SCIENCE I (RSC205D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module contributes towards understanding of basic plant morphology (roots, stems and leaves), an introduction to the vegetation units of South Africa and basic rangeland management principles. Furthermore, Veld Management Principles will form a fundamental learning unit. (Total notional time: 180 hours)

RESEARCH (RDT117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Detailed knowledge as well as an ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories of research in related fields of study in Science. The module should further provide the student with competencies such as, but not limited to review, research, writing and reporting. (Total notional time: 120 hours)

RESEARCH II: RESEARCH METHODOLOGY IN NURSING (RNS317P) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

This module prepares the student to utilise research in investigating nursing, midwifery and health-related problems. The student will be able to apply his/her knowledge of research methods to the clinical areas of nursing, midwifery including mental health nursing practice and in the community. Upon completion of the module, the student will be able to demonstrate knowledge, comprehension and application of research methods understanding when identifying and writing research proposals; to demonstrate guided response in decision-making to write proposal, using academic writing skills in in ethical manner including citing and proper referencing using appropriate referencing style avoiding plagiarism. (Total notional time: 60 hours, consisting of 22.5 hours of instructional time and 37.5 hours of self-directed learning (including assessment time))

RESEARCH III: RESEARCH PROJECT IN NURSING (RNS408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Adelaide Tambo School of Nursing Science)

This module prepares the student to conduct research in nursing, midwifery and health-related problem specifically related to proposal writing, data gathering and analysis. Dissertation writing and reporting, and the dissemination of results. Knowledge such as conducting research in clinical areas of nursing, midwifery including mental health nursing practice and in the community. Upon completion of the module, the student will have achieved research skills in conducting, evaluating and valuing research while using research methods when writing research proposals; getting ethics clearance, collecting and analysing data writing report and disseminating the results and communicating recommendations and using appropriate referencing style to avoid plagiarism. (Total notional time: 260 hours, consisting of 60 hours of instructional time and 200 hours of self-directed learning (including assessment time))

RESEARCH METHODOLOGY (STATISTICS) (RFS118G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Mathematics and Statistics)

Upon completion of this module, a student will master the fundamental and basic gathering, summarising and analysing of data to report in a research project. Statistical concepts and sampling methods; descriptive statistics; basic probabilities; probability distributions; statistical inference for means and proportions; regression and correlation analysis and statistical inference for relations in qualitative data. (Total notional time: 120 hours)

RESEARCH METHODOLOGY (THEORY) (RTF118G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Physics)

The purpose of this module is for a student to understand, distinguish and apply the scientific research process in order to produce a research proposal. The adult student; scientific research; research ethics; elements of the research process; writing a research proposal; faculty of Science research proposal template; guidelines for the preparation of dissertations and theses and Occupational Health and Safety Act No. 85 of 1993. (Total notional time: 120 hours)

RESEARCH METHODOLOGY: BIOMETRY (RBI107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Animal Sciences)

Integrated knowledge of experimental designs and analysis, hypothesis testing, analysis of variance (ANOVA), mean separation procedures, linear regression and correlation, data analysis and reporting as well as an ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories thereof as applied to the related fields of study. (Total notional time: 240 hours)

RESEARCH METHODOLOGY AND BIOSTATISTICS II (RMB207P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental Health)

Identification of research topic and preparation of pre-proposal; preparation of full proposal; statistical methods (biostatistics, variables, population and sampling, data collection methods, validity, reliability and trustworthiness, data management, analysing and interpreting data; use of statistical software programs e.g. SPSS, Epi-Info. (Total notional time: 140 hours)

RESEARCH METHODOLOGY AND ETHICS (PRF118G, RET118G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biotechnology and Food Technology)
This module prepares the student to work effectively in a scientific research environment and apply the key terms, rules, theories, methodology and techniques utilised in the field of Food Technology, ethically and professionally. (Total notional time: 120 hours)

RESEARCH METHODOLOGY AND ETHICS (RTE108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Crop Sciences)
This module is aimed at providing students with the knowledge, skills and applied competencies to engage in agricultural sciences research and be at the forefront of research in the field of agricultural sciences. The module thus focuses on the development of a critical understanding and the ability to reflect on the importance of research, the various research tools available to the agricultural sciences, research management, research ethics in agricultural sciences, research proposal writing, research approaches and procedures, evaluation of research data and the effective presentation of research to peers applying and using the appropriate rules, skills and technology. (Total notional time: 120 hours)

RESEARCH METHODOLOGY (ERM108G) **1 X 3-HOUR PAPER**
(Module custodian: Department of Environmental, Water and Earth Sciences)
Upon completion of this module, students will be able to recognise and use the major tools used for research and writing skills. In addition, the student will demonstrate his/her writing skills, team working ability and presentation skills. (Total notional time: 120 hours)

RESEARCH METHODOLOGY (RGE107V) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Environmental, Water and Earth Sciences)
A student is prepared to work effectively in a scientific environment and apply the key terms, rules, theories and techniques of research in the field of geology science. Upon completion, the student will be able to recognise and use the major tools used for research and writing skills. In addition, the student will demonstrate his/her writing skills, team working ability and presentation skills. (Total notional time: 200 hours)

RESEARCH METHODOLOGY (RHO108G) **1 X 3-HOUR PAPER**
(Module custodian: Department of Horticulture)
The student will be able to select and apply qualitative and/or quantitative research skills in horticulture or related industries. This module will provide a student with sound knowledge on the important factors needed for research planning and processes, experimental design, and different research application techniques and strategies used in practice to solve problems and address industry related situations. The student will be able to demonstrate an ability to select a sample of participants from a population using sound research principles, and design a questionnaire taking into consideration the type of information/data sought and the population dynamics. The student will demonstrate an understanding and ability to analyse and interpret research data, including basic statistical analysis, in order to make sensible deductions and conclusions in practice to solve specific problems in the related green industry and the South African community according to sound research principles in a scientific, ethical manner. (Total notional time: 300 hours)

RESEARCH METHODOLOGY (RKS108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
To prepare the student to work effectively in a scientific environment and apply the key terms, rules, theories and techniques in the field of Kinesiology and Coaching Science. Upon completion of the module, the student will be able to recognise and use the major tools used for research and writing skills. In addition, the student will demonstrate his/her writing skills, team working ability and presentation skills. (Total notional time: 240 hours)

RESEARCH METHODOLOGY (RLT108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Horticulture)
This module will provide students with knowledge, skills and applied competencies to engage in and at the forefront of research in the field of Landscape Technology. This research module will provide a student with extensive knowledge and all relevant detail to conduct a research plan with a combination of techniques to solve extensive environmental problems in the context of landscape design. The student will be able to construct a questionnaire, observation sheets and transcribe interviews conducted in a qualitative descriptive manner. The student will comply with all ethical and professional values. (Total notional time: 180 hours)

RESEARCH METHODOLOGY I (RWI107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module enables the student to resolve problems and introduce change within the practice of applied research methodology and wildlife management; and integrates theoretical knowledge and requisites essential for the management of environmental parameters on a game farm. (Total notional time: 180 hours)

RESEARCH METHODOLOGY I (REM126P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Introduction to the scientific research; reasons for research related to environmental health and health services; types of research (basic, applied, quantitative, qualitative, combination of previous); research methods (experimental/intervention, observational/surveys, exploratory, overt and covert); research tools (library, computers, measuring techniques, statistics, language, human mind); methods of identifying research needs and the criteria for selecting research topics; research ethics, human rights and community participation; steps in a research process - identification of research needs (topics), planning, execution and reporting (research report, articles, posters, presentations); conducting of a literature review and the use of citation and referencing tools e.g., Endnote. (Total notional time: 100 hours)

RESEARCH METHODOLOGY I (RNC107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This core learning module enables the student to resolve problems and introduce change within the practice of applied research methodology and conservation management. Integrated theoretical knowledge and requisites essential for the management of environmental parameters in a conservation area will be demonstrated by the graduate. (Total notional time: 180 hours)

RESEARCH METHODOLOGY II (RCF108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Nature Conservation)

The module serves to enable the student to use specialised skills in identifying, conceptualising, designing and implementing methods of enquiry to address complex problems within the context of conservation management and presented as a research project. (Total notional time: 240 hours)

RESEARCH METHODOLOGY IV (RIY418P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Chemistry)

Purpose, nature and meaning of research; Structure of a research proposal: identify a research problem; literature review; research aims, objectives and hypotheses; research design types; sampling procedures; validating results; research budget; referencing styles; Types of quantitative data; Basic principles of non-parametric tests: introduction to descriptive statistics; Probability (p-values) and hypothesis testing, introduction to inferential statistics (student's t-test, ANOVA and correlations); Interpretation of graphs and tables; Basic principles of research ethics; Dissemination of research findings. (Total notional time: 120 hours)

RESEARCH METHODOLOGY AND BIO-STATISTICS I (RBS118G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

Literature Review; Hypotheses and Research Objectives; Research methods; Data Collection Methods; Statistical Methods and Data Analysis; Research Ethics; and Creative Writing. (Total notional time: 120 hours)

RESEARCH METHODOLOGY AND SKILLS (RWS108G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

The module focuses on the development of the research capacity and scientific writing skills based on: Literature Review, Hypothesis and research objectives, Research methods, Data collection methods, Data analysis and interpretation, Research ethics and Research report writing. (Total notional time: 120 hours)

RESEARCH PROJECT IN FIRE TECHNOLOGY (RFI118G, RFI118R) **PROJECT ASSESSMENT**
(Module custodian: Department of Physics)
This module, integrates knowledge in the fire phenomenon and some equipment used to investigate material behaviour in a fire situation. It aims at preparing students to integrate knowledge in possible quantitative experimental techniques in fire measurements. It highlights the various experimental methods and equipment that have their bases in the Fire Chemistry IV, Fire Physics IV and Fire Technology IV (core module in the Advanced Diploma in Fire Technology). Measurement, data and log book; basic electronic equipment; thermal conductivity and thermal diffusivity measurements; specific heat measurement; thermomechanical measurements (coefficient of thermal expansion); thermal imaging cameras, gas detectors, thermal detectors, and voice amplifiers; cone calorimeter measurements; thermogravimetric analysis (TGA); the production and movement of smoke; analysing fire experimental data from cone calorimeter, TGA, etc. (Total notional time: 180 hours)

RESEARCH METHODOLOGY IN LIFE SCIENCES (RLS108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
This module is aimed at providing students with the knowledge, skills and applied competencies to engage in life sciences research and be at the forefront of research in the field of life sciences. The module thus focuses on the development of a critical understanding and the ability to reflect on the importance of research, the various research tools available to the life sciences, research management, research ethics in life sciences, research proposal writing, research approaches and procedures, evaluation of research data and the effective presentation of research to peers applying and using the appropriate rules, skills and technology. (Total notional time: 120 hours)

RESEARCH PROJECT (RCH108G, RCH118R) **PROJECT ASSESSMENT**
(Module custodian: Department of Chemistry)
Preparation of research proposal; presentation of research proposal; experimental methods; oral research presentations and preparation of research project report. (Total notional time: 300 hours)

RESEARCH PRINCIPLES I (RPH115P, RPI115P, RPL115P, RPN115P, RPV115P) **CONTINUOUS ASSESSMENT**
(Module custodian: Departments of Biomedical Sciences and Sport, Rehabilitation and Dental Sciences)
This module prepares the student to acquire an informed understanding of the basic principles of research and academic writing to include definitions, characteristics, as well as the concepts of scholarly writing, scholarly literature, the methodologies and designs. The student will be able to demonstrate the ability to select and apply the correct academic writing principles, citation methods, and procedures in order to avoid any form of plagiarism. Through this module, students will obtain the ability to integrate aspects of research principles and methodology in their field of study. Relevance of research is in line with national needs and biomedical ethical policies and procedures, and suitable resources need to be critically evaluated and used to facilitate the research project at postgraduate level. (Total notional time: 60 hours)

RESEARCH PRINCIPLES I (RPR115P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student to utilise research in investigating Biokinetics problems. The student will be able to apply his/her knowledge of research to the clinical areas of biokinetics with reference to the introduction to research, the research process, ethics and finding information. Upon completion, the student will be able to demonstrate knowledge, comprehension and application of research understanding when providing evidence-based care; to demonstrate guided response in gaining the skill of academic reading, use of academic writing skills in writing assignment including citing and proper referencing using appropriate referencing style. (Total notional time: 60 hours)

RESEARCH PRINCIPLES II (RPH216P, RPI216P RPL216P RPN216P, RPR216P, RPV216P,) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences and Sport, Rehabilitation and Dental Sciences)

This module prepares the student to demonstrate detailed understanding and knowledge of the main areas of research principles and the ability to apply concepts, principles and theories related to the framework of a research proposal, the different research methodologies and designs, as well as data collection principles, analysis, reliability, validity, rigour, trustworthiness, budget and funding. Through this module, the student will demonstrate understanding of the research problem and objectives within the context of a particular research methodology, as well as the ability to evaluate, select and apply the optimal sampling procedures, data collection principles relevant to a research methodology and design. The knowledge and ability to analyse, synthesise, and evaluate information from different sources of scholarly academic information, including definitions, criteria, purposes, questionnaire designs, data collection principles and methods for the application during the research process will be obtained in preparation to the next level of research principles and procedures to follow. (Total notional time: 60 hours)

RESEARCH PRINCIPLES III (RPH307P, RPL307P, RPN307P, RPV307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate integrated knowledge of the central and crucial areas of research principles and methodologies including the ability to apply concepts, principles and theories necessary for the compilation of a research proposal in the context of an academic and/or health science related environment. Through this module, students will gain understanding of the roles and responsibilities pertaining to the research supervisor and researcher. Students will learn to differentiate between research methods and their suitability and ability to resolve specific research enquiries, act ethically and professionally with dignity and integrity, as well as to manage the processing of gathered data through advanced bio-statistical methods. (Total notional time: 60 hours)

RESEARCH PRINCIPLES IV AND PROJECT (RPH408P, RPL408P, RPN408P, RPV408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to demonstrate knowledge of and engagement in the advanced aspects of research principles and techniques at the forefront of a particular medical field of study or specialisation. Students should further be able to demonstrate understanding of the analysis and interpretation of research results, the structure and composition of a research report, as well as publications and presentations. Students will gain knowledge in the use of specialised skills to identify, analyse and address abstract problems related to a research project in a field of study or specialisation, as well as to incorporate body of knowledge and methods during the problem-solving process. On completion of this module, students should show their ability to present and communicate scientific research results to a range of audiences in the format of a research article for a given journal, poster design, as well as in the form of a verbal and visual research presentation. (Total notional time: 300 hours)

RESEARCH/PRODUCT DEVELOPMENT PROJECT (RFT108G, RFT118R) **PROJECT ASSESSMENT**

(Module custodian: Department of Biotechnology and Food Technology)

This module prepares the student to function effectively in a scientific environment and apply the key terms, and techniques in the field of Food Technology. The student will identify a relevant research topic, write a proposal and conduct research according to sound scientific principles, summarise, interpret and communicate in a scientific way. Content will include, but not be limited to: Introduction and Identification of Research Topic; Motivation; Objectives and Experimental Design; Literature Review; Data Collection; Data Analysis; Interpretation; and Discussion and Conclusions. The module will include conducting a research/product development project. (Total notional time: 240 hours)

RESEARCH PROJECT (RBK408P) **PROJECT ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module prepares the student to be an independent practitioners and researchers in the industry of Biokinetics. The purpose of this module is to provide the student with an excellent opportunity to implement ideas and knowledge gathered in theory and practical courses and conduct, supervised research in the field of Biokinetics. (Total notional time: 300 hours)

RESEARCH PROJECT (RJP108G/R) **PROJECT ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

This module will provide the student with the ability to investigate physical, emotional and social aspects to improve quality of life, symptom surveillance and patient interventions, to develop systems for tracking trends in life-threatening illness symptoms and symptom management; Perform a pilot project on a small scale to prepare the student for a full-scale research project when advancing to the Master of Health Sciences: Identify and plan a research project, write a research proposal (motivation and rationale, aim and objectives, literature study, materials and methods, expected outputs, budget, planning schedule, results and discussion, conclusion, references), an oral presentation of proposal, execute a pilot study as planning for a Master's degree, write a final research report, present an oral presentation of final report, present a research poster. (Total notional time: 300 hours)

RESEARCH PROJECT (RPG108G, RPG118R) **PROJECT ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Identification of a geological problem. Literature review. Set out objectives and an experimental design. Write a research project proposal. Fieldwork and experimental work. Data Collection; Data Analysis; Interpretation; Discussion and Conclusions. Submitting a thesis. (Total notional time: 400 hours)

RESEARCH PROJECT (RPQ107V, RPQ117R) **PROJECT ASSESSMENT**

(Module custodian: Department of Mathematics and Statistics)

Project IV, and Colloquium. (Total notional time: 240 hours)

RESEARCH PROJECT (RQP108G, RQP118R) **PROJECT ASSESSMENT**

(Module custodian: Department of Mathematics and Statistics)

The module will contribute towards the development of the research capacity and scientific writing in all the related fields of study in the faculty and will thus contribute to the enhancement of the cognitive level and the scopes of knowledge involved. (Total notional time: 240 hours)

RESEARCH PROJECT IV (REW108G, REW118R) **PROJECT ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Content will include, but not limited to: Introduction and Identification of Research Topic, Motivation, Objectives and Experimental Design, Literature Review, Data Collection, Data Analysis, Interpretation, Discussion and Conclusions. The module will include conducting a research project. (Total notional time: 300 hours)

RESEARCH PROJECT IV (REP408P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental Health)

Finalisation of the research topic and full proposal developed in the previous module (including research tools and ethics approval); execution of research (including literature review) within the parameters of a prepared proposal; writing of research report (prescribed format); writing of a research article based on the requirements of a related scientific journal; preparation of posters for presentation at conferences/seminars/congresses; preparation and presentation of Power Point presentations to conferences/seminars/congresses. (Total notional time: 250 hours)

RESOURCE MANAGEMENT I (RSG105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Introduction to the ecological principles involved in natural resource management. Integrated theoretical knowledge underpin the practical management considerations for a wide range of topics, all central to the wise use and management of resources in conservation areas. Knowledge, skills and applied competencies in areas such as, but not limited to the management of resources in conservation areas. (Total notional time: 180 hours)

RESOURCE MANAGEMENT II (RSG206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Demonstrate an understanding and familiarity with principles involved in setting up an ecological management plan for a conservation area. Integrated theoretical knowledge and requisites essential for the monitoring and management of environmental parameters on a conservation area. Detailed knowledge of the main areas of the discipline, including an understanding of and an ability to apply the key terms, concepts, facts, principles, rules and theories of that discipline to unfamiliar but relevant contexts; and knowledge of areas of specialisation and how that knowledge relates to Conservation Management and Game Ranch planning. (Total notional time: 180 hours)

RESOURCE MANAGEMENT III (RSG107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

The purpose of this module is to enable the student to resolve problems and introduce change within the practice of ecological management for a conservation area. Integrated theoretical knowledge and requisites essential for the monitoring and management of environmental parameters in a conservation area will be demonstrated by the graduate. (Total notional time: 180 hours)

RESOURCE MANAGEMENT IV (RSG108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

The module serves to enable the student to resolve complex problems and introduce practical solutions within the practice of resource management. The focus is on decision support, theory of management, philosophical paradigms, decision support models, counting wildlife: theory techniques for counting wildlife, practical implications of counting, the statistics of counting, designing a count programme, genetics in conservation and modelling. (Total notional time: 240 hours)

RESPIRATORY SYSTEM, EAR AND EYE (RSE246P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

The structure and functioning of the respiratory system, ear and eye. The role of the nervous system in controlling the functioning of the respiratory system, ear and eye. Important disorders of the respiratory system, ear and eye and their prevention, non-pharmacological and pharmacological management. (Total notional time: 300 hours)

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SAMPLING AND SAMPLE PREPARATION (SSP117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Handling and processing of real samples. Sampling of liquids, solids, gases, volatiles and particulate matter. Sample preparation, analyte extraction and pre-concentration; and sample preservation techniques. Validating the extraction efficiency of an extraction method and analyte recovery. Advanced sample preparation techniques: microwave digestion, decomposition by fusion. (Total notional time: 120 hours)

SCIENCE FOR OCCUPATIONAL PURPOSE I (SOR105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

The role and importance of chemistry in everyday life. Classification and properties of matter. Atoms, molecules and ions. General properties of aqueous solutions and reactions in aqueous solutions. Motion. Forces. Energy and power. Density. Pressure. Temperature and heat. Basic Electricity. Basic Magnetism. Waves. (Total notional time: 120 hours)

SCIENCE FOR OCCUPATIONAL PURPOSES (SOI105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

The role and importance of chemistry in everyday life. Classification and properties of matter. Atoms, molecules and ions. General properties of aqueous solutions and reactions in aqueous solutions. Motion. Forces. Energy and power. Density. Pressure. Temperature and heat. Basic Electricity. Basic Magnetism. Waves. (Total notional time: 120 hours)

SECTIONAL ANATOMY AND PATTERN RECOGNITION III (SAP307P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Biomedical Sciences)

This module prepares the student to acquire integrated knowledge of sectional/slice images that demonstrate different regions of the body and a range of abnormal patterns associated with diseases as demonstrated on CT images. The module will furthermore prepare the student to distinguish between normal and abnormal radiographic patterns associated with disease. The student will be able to apply his/her knowledge of mentioned components of the module in the field of Diagnostic Radiography. (Total notional time: 120 hours)

SECTIONAL ANATOMY AND PATTERN RECOGNITION IV (SAP408P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Biomedical Sciences)
This module prepares the student to acquire, apply, integrate, and demonstrate in-depth forefront know-ledge of Sectional Anatomy of different regions of the body as demonstrated on CT images, as well as to recognise abnormal radiographic patterns associated with diseases demonstrated on these images. The module will, furthermore, prepare the student to acquire, apply, integrate, and demonstrate in-depth forefront knowledge of radiographic pattern recognition to distinguish between normal and a wide range of abnormal radiographic patterns associated with a variety of diseases. (Total notional time: 120 hours)

SEPARATION SCIENCE (SSI118G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Chemistry)
Voltammetry. Hyphenated gas chromatography methods. Liquid chromatography. Extraction. Multivariate analysis. (Total notional time: 150 hours)

SEPARATION SCIENCE III (SRS317P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Chemistry)
Fundamentals of separation processes; Separation by phase addition or creation; Separation by barriers and solid agents; Separations that involve solid phase; and Extractions. (Total notional time: 180 hours)

SEROLOGY II (SER216P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Biomedical Sciences)
This module prepares students to acquire detailed knowledge and understanding of the main areas in serology, but with specific reference to the general introduction to serological tests, antibody and antigen, enzyme-linked immunosorbent assay (ELISA), fluorescent antibody techniques. Through this module, students will acquire the necessary knowledge and skills to be able to select and apply appropriate methods and techniques related to basic test performance measurements and the evaluation of diagnostic test results during practical training on campus. (Total notional time: 120 hours)

SKILLED TOUCH PRINCIPLES AND TECHNIQUES I (STT105D) **1 X 3-HOUR PAPER AND PRACTICAL EXAMINATION**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares students to demonstrate skills and competencies to conduct an assessment of the physical and emotional state of the client and perform the appropriate massage technique. Apply knowledge in massage treatments such as Swedish massage, thermal, hydro and mechanical massage, aromatherapy and reflexology. Skills to incorporate hygienic practices, relevant professional products, adequate home-care, nutritional and lifestyle guidelines. (Total notional time: 240 hours)

SKILLED TOUCH PRINCIPLES AND TECHNIQUES II (STT206D) **1 X 3-HOUR PAPER AND PRACTICAL EXAMINATION**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares students to demonstrate skills and competencies to conduct an assessment of the physical and emotional state of the client and perform the appropriate massage therapy treatments. Apply knowledge in massage therapy treatments such as massage techniques for therapeutic and non-therapeutic purposes, advanced aromatherapy, advanced reflexology and sports massage. Skills to incorporate hygienic practices, relevant professional products, adequate home-care, nutritional and lifestyle guidelines. (Total notional time: 240 hours)

SKILLED TOUCH PRINCIPLES AND TECHNIQUES III (STT306D) **1 X 3-HOUR PAPER AND PRACTICAL EXAMINATION**
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares students to demonstrate skills and competencies to conduct and perform the appropriate massage therapy within their scope of practice and that adhere to Occupational Health and Safety regulations and professional ethics. Apply knowledge in massage therapy such as holistic health management, Manual Lymph Drainage and Advanced Sports Massage. Skills to incorporate hygienic practices, relevant professional products, adequate home-care, nutritional and lifestyle guidelines. (Total notional time: 150 hours)

SKILLED TOUCH PRINCIPLES AND TECHNIQUES IV (STT107V) **1 X 3-HOUR PAPER AND PRACTICAL EXAMINATION**

(Module custodian: Department of Pharmaceutical Sciences)

Specialised massage therapies; Manual lymph drainage massage; Mechanical lymph drainage massage; and Traditional Thai massage. (Total notional time: 300 hours)

SMALL STOCK PRODUCTION II (SSA206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students will acquire detailed knowledge, skills and applied competencies in areas such as: Small stock Industry and Small Stock Improvement Schemes; Evaluation of Small stock breeds; Small stock breeding plans, genetic evaluation and visual appraisal; Reproductive system; Production management of Small stock; Nutritional practices in Small stock; Small stock handling equipment and housing; Small stock diseases and disease control; Product description, classification and marketing; applicable Acts and regulations; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 240 hours)

SOCIO-PSYCHOLOGY I (SOP206D) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

Apply knowledge, skills and attitudes in psychology to effectively, and professionally interact with individuals, families and communities, throughout their life span, in a variety of work, therapeutic and health care settings. (Total notional time: 120 hours)

SOCIO-PSYCHOLOGY II (SOP306D) **1 X 3-HOUR PAPER**

(Module custodian: Adelaide Tambo School of Nursing Science)

Knowledge of psycho-social sciences, throughout the life span, in a variety of work environments, therapeutic and health care settings and communities in response to population needs. (Total notional time: 120 hours)

SOCIOLOGY I (SOC105P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Introduction to sociological concepts. Ethnocentrism and group dynamics. Communication skills. Human development and social psychology. Public participation and consultation processes. (Total notional time: 170 hours)

SOIL AND IRRIGATION SCIENCE (SIC117V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Crop Sciences)

Mineral N in soils; Plant available P in soils; Exchangeable K in soils; Soil pH; Soil salinity; Soil water content and potential; Irrigation systems; Irrigation efficiency. (Total notional time: 120 hours)

SOIL SCIENCE I (SOS115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Crop Sciences)

Basic principles of chemistry: a basic introduction to the structure of an atom and the properties of the periodic table, including the naming of inorganic compounds, properties and the influence of soil pH on nutrient availability with special emphasis on the sources and properties of different fertilisers used. (Total notional time: 120 hours)

SOIL SCIENCE II (SOS206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Crop Sciences)

Part A: Plant nutrients. Microorganisms and plant nutrition. Fertiliser recommendations. Irrigation. Part B: Soil forming processes. Soil classification. Soil surveys. Land capability and its assessment. Farm planning. (Total notional time: 210 hours)

SOMATIC EXERCISE THERAPY I (SET105D) **1 X 3-HOUR PAPER AND PRACTICAL ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

This module prepares the student to demonstrate skills and competencies to conduct a somatic analysis of the body and perform the appropriate somatic exercise therapy within their scope of practice and that adhere to Occupational Health and Safety regulations and professional ethics. Apply somatic exercise therapy such as health maintenance, body assessment and measurements and appropriate exercise therapy for specific physical benefit. Provided with skills to incorporate hygienic practices, relevant professional products, adequate home-care, nutritional and lifestyle guidelines. (Total notional time: 120 hours)

SOMATIC EXERCISE THERAPY II (SET206D) 1 X 3-HOUR PAPER AND PRACTICAL ASSESSMENT
(Module custodian: Department of Pharmaceutical Sciences)
This module prepares the student to demonstrate skills and competencies to conduct a fitness and health evaluation of the body and perform the appropriate somatic exercise treatments related to health management, body assessment and body therapy. Gain insight into exercise physiology in health maintenance and effectively identify and perform various types of exercise activities designed and prescribed for specific physical benefit. (Total notional time: 120 hours)

SOMATIC THERAPY (STY108G) 1 X 3-HOUR PAPER
(Module custodian: Department of Pharmaceutical Sciences)
Palliative Care in Somatic Therapy; Communication in Palliative Care; Physical and Psychosocial Aspects of Care; and Bioavailability of Product Administration. (Total notional time: 240 hours)

SOMATIC THERAPY IN PRACTICE (SYP108G) 1 X 3-HOUR PAPER
(Module custodian: Department of Pharmaceutical Sciences)
Palliative Care Management; Auditing Complementary Therapies in Palliative Care; Complementary Therapy to Improve Quality Care and Support Health Care; and Complementary Therapy for Serious Disease and Chronic Illness. (Total notional time: 360 hours)

SOMATIC RESEARCH PROJECT (SCR108G, SCR118R) PROJECT ASSESSMENT
(Module custodian: Department of Pharmaceutical Sciences)
Identify and Plan a Research Project; Write a Research Proposal; and Execute a Pilot Study as Planning for a Master's Degree. (Total notional time: 240 hours)

SPECIAL TOPICS IN AGRONOMY (AGR108G) CONTINUOUS ASSESSMENT
(Module custodian: Department of Crop Sciences)
This module will provide the student with knowledge, skills and applied competencies in areas such as, but not limited to: in-depth understanding on the characteristics of the production of varying field crops; crop husbandry techniques; identification and solving of complex challenges that are overwhelming in large-scale commercial production of field crops; and effective communication with peers in a variety of modes in the discourse of activities in agronomy. (Total notional time: 360 hours)

SPECIAL TOPICS IN CROP PROTECTION (CPT108G) CONTINUOUS ASSESSMENT
(Module custodian: Department of Crop Sciences)
This module will provide the student with knowledge, skills and applied competencies in areas such as, but not limited to: identification of pests, diseases and weeds; managing and utilising equipment and techniques used in plant pathology laboratories; proposing and designing innovative solutions to plant pathology problems; and effective communication with peers in a variety of modes in the discourse of activities in crop protection. (Total notional time: 360 hours)

SPECIAL TOPICS IN FRUIT AND VEGETABLE CROPS (FVC108G) CONTINUOUS ASSESSMENT
(Module custodian: Department of Crop Sciences)
This module will provide the student with knowledge, skills and applied competencies in areas such as, but not limited to: procedures and practices used in fruit and vegetable production research field trials and laboratory work; fruit and vegetable production problem assessment and situation analysis; propose and design innovative solutions to fruit and vegetable production problems; and effective communication with peers in a variety of modes in the discourse of activities in fruit and vegetable crops. (Total notional time: 360 hours)

SPECIAL TOPICS IN POST-HARVEST TECHNOLOGY (PHA108G) CONTINUOUS ASSESSMENT
(Module custodian: Department of Crop Sciences)
This module will provide the student with knowledge, skills and applied competencies in areas such as, but not limited to: technologies used in postharvest research; problem-solving and decision-making; propose innovative technologies to reduce food waste (fruit and vegetables); and effective communication with peers in a variety of modes in the discourse of activities in post-harvest technology. (Total notional time: 360 hours)

SPECIAL TOPICS IN SOIL AND IRRIGATION SCIENCE (SIC108G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Crop Sciences)
This module will provide the student with knowledge, skills and applied competencies in areas such as, but not limited to: plant nutrition and soil fertility; irrigation; and effective communication with peers in a variety of modes in the discourse of activities in soil and irrigation science. (Total notional time: 360 hours)

SPECIALISED PHARMACY AND HOSPITAL PHARMACY PRACTICE (SPH448P) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Pharmaceutical Sciences)
Major managerial and clinical areas of pharmacy, e.g. logistics and financial management, including cold chain management, standard operating procedures, control of bulk compounding and preparation of sterile products, pharmacy and therapeutic committees, pharmacoeconomics in drug selection, drug information, infection control, clinical nutrition, (parenteral and enteral feeding and stoma care), oncology, radiopharmacy and radioisotopes, transplants and related drug therapy, handling of pharmaceutical waste, the role of the consultant pharmacist. (Total notional time: 240 hours)

SPECIALISED RADIOGRAPHIC IMAGING EQUIPMENT III (SRI307P) **1 X 3-HOUR PAPER**
(Module custodian: Department of Physics)
This module prepares the student to demonstrate integrated knowledge in the fundamental concepts and functioning of x-ray apparatus used in various specialised diagnostic radiographic imaging modalities: Fluoroscopy, Dentistry, Mammography, Digital Radiography, Digital Tomography, MRI, Ultrasound, Bone Densitometry and Nuclear Medicine. In addition, it seeks to help students develop a conceptual understanding of the diagnostic x-ray imaging components per each modality; develop the ability to reason and compare in an organised manner; and this is essential in optimising modalities. (Total notional time: 180 hours)

SPECTROSCOPY (SCY118G) **CONTINUOUS ASSESSMENT**
(Module custodian: Department of Chemistry)
Mass spectrometry. Inductively coupled plasma mass spectrometry. X-ray diffraction spectrometry. Magnetic resonance spectroscopy. (Total notional time: 150 hours)

SPORT AND EXERCISE PSYCHOLOGY I (SEP306D) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
To prepare the student to independently design basic outcome-specific psychological skill training interventions and provide advisory service on psychological aspects affecting sport participation and performance. The student will be able to apply/import his/her knowledge of general psychological theories and research related to sport and exercise behaviour to individual and team sport participants at recreation, competitive, novice, and/or professional level. (Total notional time: 180 hours)

SPORT AND EXERCISE PHYSIOLOGY IV (SXP107V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
This module prepares the student to independently design basic outcome-specific cognitive behaviour modification interventions and provide advisory services related to the role of personality, arousal regulation, training environments, group processes, and leader behaviour in sport and exercise. The student will also be able to apply/import knowledge of anecdotal reports, theoretical frameworks and scientific findings concerning the facilitation of psychological growth, development, health and well-being of sport participants at recreation, competitive, novice, and/or professional level. (Total notional time: 210 hours)

SPORT AND EXERCISE PSYCHOLOGY IV (SEP107V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
The purpose of this module is to provide a focused and applied approach to students interested in sport science. Students will learn the importance of an evidence-based approach in developing exercise prescriptions with regards to conditioning and performance of athletes. It will provide students with an in-depth discussion of physiological adaptation from exercise and provides a thorough review of all components of an athlete's training program. (Total notional time: 210 hours)

SPORT INJURIES IV (SIJ107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

The module will focus on the anatomy, functional anatomy, assessment, injury prevention and the rehabilitation of each musculoskeletal condition. It will also cover the disorders of the skin within a sporting context. On successful completion of this module, the student will be able to apply these new skills to the sporting environment. (Total notional time: 180 hours)

SPORT PERFORMANCE ANALYSIS IV (SPA107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module provides students with a theoretical knowledge and skills to analyse the tactical, technical, and physical aspects of sport in order to improve the performance of athletes. (Total notional time: 210 hours)

SPORT PRACTICAL I (SPL105D) **CONTINUOUS ASSESSMENT**
SPORT PRACTICAL II (SPL206D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

A practical learning module which equips a student with knowledge, skills and values to safely promote physical activity, participation and performance in four nationally-recognised sporting codes. The purpose of this module is to offer a student the needed theoretical knowledge, practical experience and relevant designation to render services as an Apprentice Coach and/or Coach Assistant. (Total notional time: 200 hours for SPL105D and 240 hours for SPL206D)

SPORT PRACTICAL III (SPL306D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

A practical learning module which equips a student with knowledge, skills and values to safely promote physical activity, participation and performance in four nationally-recognised sporting codes. The purpose of this module is to offer students the needed theoretical knowledge, practical experience and relevant designation to render services as a coach. (Total notional time: 260 hours)

SPORT SCIENCE I (SSC105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

The purpose of this module is to provide the student with insight into the basic concepts of health, wellness and fitness. A wide range of topics pertaining to motor- and health-related fitness components, and an introduction to a number of basic exercises which will form the basis for Sport Science II and III. (Total notional time: 200 hours)

SPORT SCIENCE II (SSC206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

A module which combines the concepts central to periodisation and training theory with contemporary advances in sport science, physiology, and coaching. This will provide the students with a better understanding of the principles, objectives, and components of a successful long-term training programme and how to plan the right programme to achieve optimal athlete performance goals. The module will also provide a sound understanding of proven strategies for optimal peaking and specifics on training for better motor ability, working capacity skill effectiveness, and psychological adaptability. (Total notional time: 180 hours)

SPORT SCIENCE III (SSC306D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

A module that builds on knowledge of exercise physiology I and Sport Science II by exploring in greater depth how the body adapts to chronic exercise, the mechanisms responsible and the impact on sports performance. This module evaluates current practice with respect to training and athlete's sport performance. Students will have the opportunity to conduct sport assessments in the form of field tests following international sport testing guidelines. An understanding of this module will allow the student to identify the strengths and weaknesses of an athlete and to interpret test data effectively in order to prescribe the necessary interventions. (Total notional time: 200 hours)

SPORT SCIENCE IV (SSC107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module comprehensively covers the principles associated with safe and effective physical training and conditioning. In addition, a wide variety of case studies and the latest article and journal investigations enable the student to adopt an eclectic and pragmatic approach to the dynamic field of physical fitness, exercise and the science of sport conditioning. Competent qualifying students will also be able to analyse, design and adapt exercise prescriptions and exercise techniques in order to promote specific performance improvements as well as an increase in the physical safety of performance in general. Lastly, the student will be well positioned to extend their learning and practice to other areas where sport and exercise science is applied to training programmes, or to strive toward unit standards and practice at higher levels. (Total notional time: 210 hours)

SPORT STUDIES I (SPS105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

The student learns to appreciate the Sociological, Philosophical and Historical aspects of human behaviour in the broad field of Sport Studies. With this knowledge, he/she will be able to distinguish and identify between psychology of sport, sociology of sport, philosophy of sport and the history of sport as well as identify and discuss the controversies in sport. (Total notional time: 120 hours)

SPORT STUDIES II (SPS216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

The student learns to appreciate the Sociological aspects of human behaviour in the broad field of Sport Studies, and specifically in Sport and Recreation. It enables him/her to appreciate the social significance of sport and recreation in modern societies, recognise the structures, understand relationships and problems in sport and work within this social framework for a better understanding of the phenomenon sport. Identify and solve problem by using critical and creative thinking. With this knowledge, the students will be able to describe the processes of participation in sport and be able to explore equity issues regarding gender in sport; be able to explain the impact of social class in sport; the relationship between sport and economy; and discuss the role of media and politics and other controversies in sport. (Total notional time: 60 hours)

STABLE MANAGEMENT I (SMA115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students are capacitated with a detailed knowledge of equine stable management and horse husbandry principles and practice. Students will acquire knowledge, skills and applied competencies in areas such as: Stable complex design and construction; Equestrian training and riding arenas design and construction; Paddock management and field-kept horses; Modern equine stable management principles and practice; Care of stable-kept horses and organisation of equestrian facilities; Equine and equestrian enterprise administration and record keeping; Equine and equestrian enterprise personnel management; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 120 hours)

STALLION MANAGEMENT II (STM216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Animal Sciences)

Students are capacitated with a detailed knowledge of equine stable management and horse husbandry principles and practice. Students will acquire knowledge, skills and applied competencies in areas such as: Stallion reproductive biology and semen evaluation; Stallion selection practices and applied theories; Stallion infertility and impotency; Stallion management protocols for reproductive efficiency and welfare of breeding stock; Breeding methods and procedures; Semen preservation techniques and protocols for transportation; and how that knowledge relates to other fields, disciplines or practices. (Total notional time: 120 hours)

STERILE PHARMACEUTICAL PRODUCTS (SPP347P) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Pharmaceutical Sciences)

An overview of the manufacturing of sterile pharmaceutical products. Sterilisation. The control of contamination. The manufacturing of sterile pharmaceutical products. The principles and practice of quality assurance, including good manufacturing practices and quality control, as applied to sterile pharmaceutical products. (Total notional time: 120 hours)

STRATEGIC MANAGEMENT I (SWI107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Organisational Management and the diversity in South African organisations. It further enables the student to resolve problems and introduce change within the field of Organisational Management, specifically in the wildlife and ecotourism industry. The focus of the module is to provide the student with the knowledge to understand management in the context of the Wildlife Management and other industries. (Total notional time: 180 hours)

STRATEGIC QUALITY MANAGEMENT (SQM108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Establishing the context of the organisation; The strategic management process; Strategic planning and goal setting; Leadership and change management; Organisational culture: Empowering employees for change; Strategic planning tools; The House of Quality/Voice of the customer; Strategic planning in an integrated management context; Strategic value chain management; Strategic planning and Quality Function Deployment; Assessing organisational performance using performance models; SWOT analysis/FMEA and managing risk; Data collection management and decision-making; Approaches to problem-solving /tools; Continual Improvement and Benchmarking; Integrating ISO 14000, ISO 18000, ISO 16949, ISO 17025, and ISO 22000 into strategy implementation. (Total notional time: 240 hours)

STRATIGRAPHY (STG115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Principles of stratigraphy. Introduction to strata and basin formation. Types of stratigraphic correlations including lithostratigraphy, biostratigraphy, magnetostratigraphy, chronostratigraphy. Discussion of geologic timescale and basic rock dating principles. (Total notional time: 60 hours)

STRUCTURAL GEOLOGY (SGG216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction to the nature of structural geology. Introduction to geologic structures - their classification. Displacement and strain. Force and stress in rocks and strength of rocks. Deformation mechanisms. Joints. Faults and faulting. Folds and folding. Fault-fold interactions. Foliation and lineation. Shear zones and progressive deformation. Tectonism and active tectonics. Geologic mapping. (Total notional time: 120 hours)

SYNTHETIC CHEMISTRY (SCH117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Substitution reactions and mechanisms. Elimination reactions and mechanisms. Addition reactions and mechanisms. Organometallic Chemistry and Coordination Chemistry. (Total notional time: 150 hours)

SYNTHETIC CHEMISTRY (SCH118G) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Chemistry)

Chiral organic synthesis. Organometallic chemistry. Natural products. Medicinal chemistry. Coordination Chemistry. (Total notional time: 150 hours)

T

THEORY OF ENVIRONMENTAL RESEARCH (TER117V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

The application of the key terms, rules, theories and techniques of research in the field of environmental science. Upon completion, the student will be able to recognise and use the major tools used for research and writing skills. In addition, the student will demonstrate his/her writing skills, team working ability and presentation skills. (Total notional time: 240 hours)

THERMAL ANALYSIS AND KINETIC METHODS (THM117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Chemistry)

Principles of phase transformation and thermal analysis of solids. Polymorphism, allotropy, superheating, supercooling, metastable and equilibrium states. Thermodynamics and kinetics of phase transformation. Thermogravimetric analysis (TGA), Differential Thermal Analysis (DTA) and Differential Scanning Calorimetry (DSC). Kinetic variables and parameters affecting efficient TGA, DTA and DSC techniques for the determination of endotherms, exotherms and weight loss on heating or cooling of materials and quantitative analysis. (Total notional time: 120 hours)

THERAPEUTIC RECREATION (TPR206P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

This module teaches the student an understanding of community recreation and health care settings as well as the provision of professional services by Biokineticist/Therapeutic recreation professionals to special groups in the community fostering inclusivity. Students are expected to show independent research and studies at this level with depth knowledge about the related issues and the application in practice. (Total notional time: 150 hours)

V

VEGETABLE PRODUCTION II (VGP206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Crop Sciences)

Vegetable production planning. Vegetable classification. Seed quality and germination. Seed treatments and manipulation. Soil preparation. Seedling production. Transplanting. Vegetable production systems. Fertilisers and fertigation. Irrigation and mulching. Vegetable production under protection. Vegetable crop rotation, hygiene, and crop protection. Quality and marketing management. Vegetable production (Tomato, beetroot, lettuce, cabbage, onions and pumpkins). (Total notional time: 210 hours)

VETERINARY HAEMATOLOGY II (VHT216P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Biomedical Sciences)

This module prepares students to acquire detailed knowledge and understanding of normal and abnormal erythrocytes, leucocytes and haemostasis. The student will master the ability to demonstrate and apply his/her knowledge and understanding of the fundamental principles and concepts of Veterinary Haematology, as well as the analytical techniques to determine these parameters pertaining to the field of veterinary laboratory science. (Total notional time: 120 hours)

W

WASTE MANAGEMENT IV (WMA408P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

History of solid waste management; South African waste profile; environmental impact of waste; legislation, conventions and international management; classification, analysis and sampling of waste; hierarchy of waste; waste collection and transportation; waste transfer and disposal; role of government and private institutions; resource recovery and waste processing such as re-use, recycling, reduces and composting; waste information systems; waste management plans; hazardous waste management, health care risk waste management, disposal for the diseased animal and the dead; monitoring and analysis of waste generation, storage, collection, storage and disposal in various institutions and sectors; economic impact, business model and marketing on solid waste management in private and public sector. (Total notional time: 210 hours)

WASTEWATER TREATMENT I (WWT105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

This module prepares the student to demonstrate an understanding of wastewater treatment practice in ways that produce good quality wastewater effluents. The student will be able to apply his/her knowledge of the various unit processes to produce wastewater effluents that comply with the effluents standards as set by the custodian (Department of Water Affairs and Forestry). Upon completion of this module, the student will be equipped to understand, explain and discuss the roles of a process controller such as to safely operate and maintain wastewater treatment facilities. This will include correct handling of machinery and chemicals; safe and effective performance of the control tests, and their interpretation and application in the plant operation; as well as the regular reporting and recording of day to day activities. (Total notional time: 210 hours)

WASTEWATER TREATMENT I (WWT215D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Composition of wastewater, sources of wastewater and flow rates variations. Preliminary wastewater treatment, primary sedimentation, secondary wastewater treatment (attached and suspended growth processes), disinfection. Wastewater treatment for small communities (types works, applications, operation and maintenance). (Total notional time: 210 hours)

WASTEWATER TREATMENT II (WWT106A) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Characteristics of nutrients in domestic wastewater, advanced wastewater treatment processes: biological nutrient removal including nitrification, denitrification and enhanced phosphate removal and chemical phosphate removal, tertiary wastewater treatment including wetland treatment, sludge treatment processes including: thickening, stabilisation, conditioning and dewatering. Sludge management and utilisation. (Total notional time: 180 hours)

WASTEWATER TREATMENT II (WWT316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Characteristics of nutrients in domestic wastewater, advanced wastewater treatment processes: biological nutrient removal including nitrification, denitrification and enhanced phosphate removal and chemical phosphate removal, tertiary wastewater treatment including wetland treatment, sludge treatment processes including: thickening, stabilisation, conditioning and dewatering. Sludge management and utilisation. (Total notional time: 180 hours)

WASTEWATER TREATMENT PROCESS DESIGN IV (WWP108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

The module content includes classification of biological processes, basic principles of biological processes, stoichiometry and kinetics in aerobic/anoxic reactors, modelling suspended growth systems and design of biological treatment processes. (Total notional time: 240 hours)

WATER ANALYSIS I (WAN206D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Application of the following methods on potable water, wastewater, industrial effluents and mine water samples: preparation and standardisation of solutions, physical parameters, titrimetric analysis, gravimetric analysis, colorimetric analysis and chemical dosages. (Total notional time: 210 hours)

WATER ANALYSIS I (WAN106A) **PRACTICAL EVALUATION**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Application of the following methods on potable water, wastewater, industrial effluents and mine water samples: preparation and standardisation of solutions, physical parameters, titrimetric analysis, gravimetric analysis, colorimetric analysis and chemical dosages. (Total notional time: 210 hours)

WATER ANALYSIS II (WAN316D) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Application of the following methods on potable water, wastewater, industrial effluents and mine water samples: Ion selective electrodes analysis, spectrophotometric and colorimetric analysis, wastewater treatment control tests, chemical dosage for phosphate removal and sludge dewatering practical tests. (Total notional time: 120 hours)

WATER ANALYSIS III (WAN107V) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Application of the following methods on potable water and wastewater, industrial effluents and mine water samples: Atomic Spectroscopy, Chromatographic and Electrophoretic Methods, Water Softening, Breakpoint Chlorination, Biological Oxygen Demand (BOD), Introduction to Molecular Biology, Introduction to bioinformatics, Molecular Laboratory Techniques. (Total notional time: 120 hours)

WATER CHEMISTRY I (WCH216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction: Chemical equations, type of chemical reactions, calculations from chemical reaction equations, solutions and concentrations, chemical equilibrium and thermodynamics, factors affecting chemical equilibrium. Acid/base equilibria. Solubility equilibria. Oxidation-reduction equilibria. General principles of the chemical water analysis: sample preparation, titrimetric, gravimetric, turbidity, conductivity, pH, colour, tastes and odours. (Total notional time: 210 hours)

WATER CHEMISTRY I (WCH106A) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction: Chemical equations, type of chemical reactions, calculations from chemical reaction equations, solutions and concentrations, chemical equilibrium and thermodynamics, factors affecting chemical equilibrium. Acid/base equilibria. Solubility equilibria. Oxidation-reduction equilibria. General principles of the chemical water analysis: sample preparation, titrimetric, gravimetric, turbidity, conductivity, pH, colour, tastes and odours. (Total notional time: 210 hours)

WATER CHEMISTRY II (WCH316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Basic concepts of organic chemistry, common food related organic compounds, detergents, pesticides, trace organic compounds, behaviour of organic compounds in the environment, natural organic matter. Chemical process kinetics. Analytical techniques (ion selective electrodes, spectroscopy and colorimetric. Weathering of rocks and the influence of water quality). (Total notional time: 120 hours)

WATER CHEMISTRY III (WCH117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Atomic and Molecular Spectroscopy: Atomic Absorption Spectroscopy (AAS), Flame Photometer, Ultraviolet-Visible (UV) and Infrared Spectrophotometry, Fourier Transform Infrared (FTIR) Spectroscopy, Chromatographic and Electrophoretic Methods, Selecting an Analytical Method and Checking the Correctness of Analysis Results. (Total notional time: 120 hours)

WATER CHEMISTRY IV (WCH108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Analytical techniques included are: Spectroscopic Methods (Ultraviolet and Visible Fluorescence, Fourier Transform Infrared, Nuclear magnetic resonance (NMR, H NMR, C NMR, N NMR, 1- D NMR and 2-D NMR), Other Characterization Methods (ICP AES, GC–MS, FIFFF, FTICR-MS), Chromatographic Methods (Adsorption chromatography, Ion exchange chromatography, Ion pair chromatography, Size exclusion chromatography (gel permeation chromatography), Affinity chromatography, Gradient separation, Analytical HPLC, Gas Chromatography-Mass Spectrometry (Gas Chromatography-Mass Spectrometry(GC- MS), Flow Field-Flow Fractionation (FFFF), Kinetics (Adsorption Kinetic, Adsorption Isotherms Adsorption Thermodynamics). (Total notional time: 150 hours)

WATER DISTRIBUTION AND WASTEWATER COLLECTION III (WCD117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Knowledge regarding the general principles and practices of water distribution and wastewater collection. The module focuses on understanding the hydraulics of water distribution and wastewater collection networks operation, maintenance, and designing of distribution systems/wastewater collection networks. (Total notional time: 120 hours)

WATER LEGISLATION (WLG106A) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction and background to legislation. National Water Act, 1998 (Act No. 36 of 1998). Water Services Act, 1997 (Act No. 108 of 1997). Blue and green drop certification. Water safety and wastewater risk abatement plan. (Total notional time: 120 hours)

WATER MICROBIOLOGY I (WMB115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

History and scope of microbiology (outlining the historical background of microbiology). Study of microbial structure, microbial nutrition, growth and control. Microbial diversity (Microbial taxonomy, Bacteria, Protozoa, Algae, Viruses). Water-related diseases (Water born, Water based, Water washes, Water-related insect vectors, Airborne diseases). Practical (Detection and identification of water and wastewater microorganisms indicator organisms (E.coli, Faecal coliforms, Total coliform) using membrane filtration technique. Identification of microorganisms using gram staining and microscope. (Total notional time: 120 hours)

WATER MICROBIOLOGY II (WMB216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Water and Wastewater Microorganisms (Origin of microbes, types and characteristics of water wastewater, E.coli, Total coliforms, Faecal coliforms, Salmonella and Shigella spp, and growth). Microbial metabolism (Nutritional biochemical pathway used by microbes in water and wastewater). Environmental Water Quality Management. Microbiology and process control. Introduction to molecular microbiology (Synthesis of nucleic acids - DNA, RNA, and proteins in cells). Practical (Detection and identification of water and wastewater microorganisms using biochemical analysis. Identification of indicator organisms (Coliphages, Salmonella and Shigella spp), Preparation of media. (Total notional time: 180 hours)

WATER OPERATIONS I (WAO106A) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Water treatment plant safety; sampling and monitoring of unit processes; chemical handling and dosing; efficiency of each unit operation/process and compliance of effluent/product water with standards. Estimation of treatment costs. (Total notional time: 120 hours)

WATER PLANT MANAGEMENT I (WPM106A) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Principles of general management, human resource management, employment relations and labour legislation, managing people and teams. Operations management. Inventory management, Safety management. Budgeting (types of budgets, drafting an annual budget, the use of budgeting to control costs). (Total notional time: 180 hours)

WATER PLANT MANAGEMENT I (WPM216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Principles of general management, human resource management, employment relations and labour legislation, managing people and teams. Operations management. Inventory management, Safety management. Budgeting (types of budgets, drafting an annual budget, the use of budgeting to control costs). (Total notional time: 180 hours)

WATER QUALITY I (WQU105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

This module prepares the student to apply knowledge and skills about maintaining water quality from water sources and evaluating the quality of water produced by water and wastewater treatment plants. The student will be able to apply his/her knowledge of various laboratory techniques to evaluate the performance of water treatment plants in order to produce effluents which are acceptable according to water quality guidelines. Upon completion of the module, the student will be able to apply his/her knowledge and skills to evaluate the quality of water from different water sources and treatment plant unit processes. The student will also have knowledge and skills to perform basic water analysis. (Total notional time: 180 hours)

WATER QUALITY AND WASTEWATER MANAGEMENT III (WQW307P) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental Health)

Principles of water quality management; sources of water supply, gender mainstreaming and protection; water quality control, standards and legislation; water sampling and examination; water safety plans such as blue drop and green drop strategies (waste water); industrial waste water pollution and management; sanitation technologies and gender mainstreaming; water resource and hygiene management; prevention and control of water related diseases using participatory education strategies; sanitary and water inspections in community facilities, ports and harbours. (Total notional time: 150 hours)

WATER RESOURCES MANAGEMENT II (WRM117V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Policy, legislation and institutional framework; Evaluation of regional institutions; Environmental sustainability and water resources management; Framework for mainstreaming the Environment in Water Resources Management; Water quality management and pollution control; and Water and economy. (Total notional time: 120 hours)

WATER RESOURCES MANAGEMENT III (WRM108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

The content will include (but not limited to): Watershed degradation and management, Valuing the environment in water resources management, The role and importance of aquatic ecosystems in water resources management and Environmental flows, requirements and assessments, Water quality and the environment. (Total notional time: 150 hours)

WATER SCIENCE I (WSC105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

This module prepares the student to apply basic science knowledge and skills in the production of drinking water and the treatment of wastewater. The student will be equipped with knowledge of chemical reactions which take place in water, and microbial processes in water treatment, as well as basic mathematics and physics concepts and competencies relevant to water treatment operations. Upon completion, the student will be able to apply his/her knowledge of chemistry, microbiology, mathematics and physics to operate and control water and wastewater treatment plants. (Total notional time: 180 hours)

WATER SERVICES MANAGEMENT III (WSG108G) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Water services contracts and the law, Strategic Management, Benchmarking, Customer Management, Managing technology and innovation, Environmental management and sustainable development concepts. (Total notional time: 150 hours)

WATER TECHNOLOGY I (WTE115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Water cycle, influence of climate and topography, rainfall mechanisms, availability of water and groundwater in South Africa, users of water sources, alternative water sources. Basic water quality. Introduction to water and wastewater treatment. Decentralised water and sanitation. Pollution (types of pollution, Point and non-point source pollution, Heat pollution, Influence of pollution on a water source). (Total notional time: 120 hours)

WATER TREATMENT I (WTR105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

This module prepares the student to apply knowledge and skills about water treatment unit processes and equipment to produce drinking water from a variety of raw water sources. The student will be able to apply his/her knowledge of the various unit processes to produce effluents that comply with the relevant legislation and water quality guidelines in a sustainable manner. Upon completion of the module, the student will be able to apply his/her knowledge and skills to treat potable water in a conventional treatment process by making use of the following unit processes: coagulation, flocculation, sedimentation, filtration and disinfection. The student will also have knowledge and skills about a range of unit processes that can be used to treat water to address specific water quality problems such as stability, hardness, fluoride and salinity. (Total notional time: 210 hours)

WATER TREATMENT I (WTR215D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Introduction, abstraction and pre-treatment, coagulation and flocculation, sedimentation filtration, and disinfection. Operation and monitoring of the unit processes, including process related calculations and equipment. (Total notional time: 210 hours)

WATER TREATMENT II (WTR106A) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Water stabilisation, Water softening. Desalination. Ion exchange. Iron and manganese removal. Fluoridation and Defluoridation. Water treatment residues. Water storage. Quality control in distribution systems (Theoretical conditions for complete attainment of water quality control, causes of poor water quality in distribution systems, operation and maintenance practices). (Total notional time: 180 hours)

WATER TREATMENT II (WTR316D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Environmental, Water and Earth Sciences)

Water stabilisation, Water softening. Desalination. Ion exchange. Iron and manganese removal. Fluoridation and Defluoridation. Water treatment residues. Water storage. Quality control in distribution systems (Theoretical conditions for complete attainment of water quality control, causes of poor water quality in distribution systems, operation and maintenance practices). (Total notional time: 180 hours)

WATER TREATMENT PROCESS DESIGN IV (WTP108G) **1 X 3-HOUR PAPER**
(Module custodian: Department of Environmental, Water and Earth Sciences)
The contents of this module: Predesign Considerations, Plant Setting, Facilities Design, Special Plant Hydraulics, Construction and Operating Cost Estimation and Modelling. (Total notional time: 240 hours)

WATER UTILITY MANAGEMENT II (WUM117V) **1 X 3-HOUR PAPER**
(Module custodian: Department of Environmental, Water and Earth Sciences)
Maintenance management. Principles of Total Quality Management. Principles of Project Management. Ethics for professionals. Cost recovery. (Total notional time: 120 hours)

WIL HORTICULTURE (WHI316D, WHO316D) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Horticulture)
Propagation of annuals. Preparation seed, germination mix, sanitation. Seed sowing techniques. Pricking out and transplanting, annual identification. Vegetative propagation. Preparation of propagation medium, greenhouse sanitation, propagation by cuttings: different types. Cultivation and maintenance of cuttings, disease and pest management, transplanting rooted cuttings. Interior plantscaping. Maintenance of office plants, maintenance of greenhouse plants, transplanting, fertilizer application, pest control sanitation. Propagation, cultivation and maintenance of plants (trees, shrubs, perennials, grasses, groundcovers, etc.). Seed harvesting and sowing, transplanting and division. Maintenance and fertilizing, plants, batching, staking. pruning, mulching, sanitation. Identification of plants. Identification: trees, palms, shrubs, perennials, ground covers, climbers, ornamental grasses, indoor foliage plants, etc. Related horticultural practices, pest and disease management, greenhouse management, irrigation, hydroponics. Research. Research projects, data collection, report writing etc. Basic management and record-keeping. WHI316D is subject to Industry memorandum of understanding (MOA). (Total notional time: 600 hours)

WIL IN ANALYTICAL CHEMISTRY I (WAC316D) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Chemistry)
This module includes: Introduction to Work-Integrated Learning; Laboratory organisation and management, sampling and sample handling, volumetric analysis, gravimetric analysis, instrumental analysis; Quality management; Reporting results; and WIL reflection. (Total notional time: 600 hours)

WIL IN ANIMAL PRODUCTION (WAP306D, WAP316R) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Animal Sciences)
The module is designed to prepare students to function effectively in a working environment, which may include animal production units, research or any relevant work environment associated in the cognitive field. The students will demonstrate detailed knowledge, skills and applied competencies such as livestock production systems and improvement whilst placed in the range of livestock industries. (Total notional time: 1200 hours)

WIL IN BIOTECHNOLOGY I (WBT316D) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Biotechnology and Food Technology)
The student is exposed to as many techniques (microbiology, molecular technology and chemical analysis) and apparatus and as much industrial experience as possible in order to further prepare the student for the industry. (Total notional time: 600 hours)

WIL IN CROP PRODUCTION I (WCP306D) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Crop Sciences)
A practical internship of one semester at an approved agriculture-related enterprise. A report on the internship, as well as tasks relating to the specialisation field of the student. An oral examination is taken at the end of the period. (Total notional time: 1200 hours)

WIL IN DENTAL TECHNOLOGY III (WDY326D) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)
A Cooperative Education programme that will enhance and enrich the student's knowledge and practice skills that were acquired in the simulated work environment in a real-world setting. The student is also exposed to the tasks and practices found in such a place of work. (Total notional time: 240 hours)

WIL IN ENVIRONMENTAL SCIENCES I (WES316D) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Environmental, Water and Earth Sciences)
Introduction to WIL (WDTL): WIL unpacked (purpose, outcomes, procedures-timeframe etc.) Roles and responsibilities (TUT staff, students, institutions). Action learning (Observation, problem-solving, action plans, Reflection practices). Development of applied competencies (PJBL and WBL): Producing and Communicating Information, specifically conducting stakeholder participation. Problem-solving. Collection of baseline environmental data and managing this data. Report writing such as is required for background information documents or basic assessment reports. Reflection. (Total notional time: 600 hours)

WIL IN EQUINE SCIENCES I (WEQ306D, WEQ316R) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Animal Sciences)
A scientific body of knowledge within an international, but mainly in a South African context; and how that knowledge relates to other fields, disciplines or practices. Upon completion of the module, the student will be able to function in a working environment, which can include equine breeding operations, competitive and/or instructional stable yards, ecotourism and equine health care facilities as well as research or any relevant work environment associated in the cognitive field. (Total notional time: 1200 hours)

WIL IN FIRE TECHNOLOGY I (EXF216D, EXF216U) **WORK-INTEGRATED LEARNING**
WIL IN FIRE TECHNOLOGY II (EXF316D, EXF316U) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Physics)
Training and experience necessary to achieve a specific position or rank. Students are evaluated in the critical tasks necessary to safely and adequately function in the required position. Practical training includes: human resource management, community and government relations, administration, inspection and investigation, emergency service delivery, communication and radio procedures, safety and facility management. (Total notional time: 300 hours)

WIL IN FOOD TECHNOLOGY I (WFT316D) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Biotechnology and Food Technology)
The student is exposed to as many techniques and apparatus and as much industrial experience as possible in order to further prepare for the industry. The student must be exposed to many aspects relevant to the field of food technology and the food industry as a whole. Students must be subjected to at least two of the following areas relevant to the food industry: Research and product development, production, processing, manufacturing and quality control and quality assurance (70%). Stock Control and Marketing can form a minor part (30%) of the training programme. (Total notional time: 600 hours)

WIL IN GEOLOGY I (WGD316D/R) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Environmental, Water and Earth Sciences)
Introduction to WIL (WDTL): WIL unpacked (purpose, outcomes, procedures-timeframe, etc.) Roles and responsibilities (TUT staff, students, institutions). Action learning (observation, problem-solving, action plans, Reflection practices). Development of applied competencies (PJBL and WBL): Producing and Communicating Information. Problem-solving. Geological report writing. (Total notional time: 240 hours)

WIL IN LANDSCAPE TECHNOLOGY I (WLI316D, WLT316D) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Horticulture)
This module involves maintenance practices such as pest and disease identification, staking, pruning, mulching and other related maintenance according to the standard norms as highlighted by South African Landscape Institute (SALI). Design and quantifying of materials for designs will be a priority. Basic construction skills such as paving, building of steps and water features is explored. Planting of trees, shrubs, groundcovers and lawn in a landscape setup is managed. Basic report writing of findings and problem-solving skills will be applied. Basic management skills and developing of planning documents in a design setup is part of the work integrated learning programme. WLI316D is subject to Industry memorandum of understanding (MOA). (Total notional time: 600 hours)

WIL IN SOMATIC THERAPY I (WSM206D) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Pharmaceutical Sciences)
Simulated learning on campus which prepares the student to integrate academic learning and real-life experience with its application at the university as part of the fulfilment of the learning programme towards a qualification. (Total notional time: 120 hours)

WIL IN SOMATIC THERAPY II (WSM306D) **WORK-INTEGRATED LEARNING**

(Module custodian: Department of Pharmaceutical Sciences)

Work-based learning to integrate academic learning and real-life experience at an approved hospital, health clinic or medical clinic as part of the fulfilment of the learning programme towards a qualification. (Total notional time: 300 hours)

WILDLIFE ECOLOGY I (WEY105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module looks at the ecology of individual organisms in terms of the abiotic component of the ecosystem as well as population ecology dynamics with regards to ecological co-actions such as competition, predation, mutualism, amensalism, commensalism and parasitism. Furthermore, the learning module will introduce students to water as a crucial resource for all living organisms. It will contribute to new knowledge regarding water sources, water quality and infrastructure based on ecological principles relevant for wildlife ranches in Southern Africa. These all-form fundamental core competencies for game farm managers in the wildlife ranch industry. (Total notional time: 240 hours)

WILDLIFE ECONOMICS I (WLC105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module provides fundamental basics on general management, financial management, public administration and legislation applicable to South Africa's conservation estate and game farm industry including basic computer skills. These are fundamental core competencies for game farm managers and resource managers entering the wildlife industry. (Total notional time: 240 hours)

WILDLIFE ECONOMICS II (WLC206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module provides students with the necessary knowledge and techniques to make effective financial and marketing management decisions. The syllabus covers various aspects of management processes, economic principles, budgets, marketing management processes and marketing instruments as well as consumer behaviour and marketing research. (Total notional time: 240 hours)

WILDLIFE ECONOMICS III (WLC107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Marketing instruments, product mix in perspective and product decisions, distribution management and marketing communication, market analysis, direct marketing, sales promotions and publicity, pricing decisions and the product life cycle. The module enables the student to resolve problems and introduce change within the field of Wildlife Economics, specifically in the Wildlife Industry. The focus of the module is to provide the student with the knowledge to effectively implement the marketing management process and to demonstrate integrated understanding of principles of marketing management and marketing instruments. The module will be assessed through integrated assessment strategies, and will contribute to the promotion mark of the qualification. (Total notional time: 180 hours)

WILDLIFE MANAGEMENT I (WMG105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module covers basic planning, infrastructure development and maintenance of infrastructure for wildlife undertakings. The module also contributes to an understanding of the nature and extent of the South African wildlife industry, role-players, game harvesting and meat processing. These all-form fundamental core competencies for game farm managers and other technical personnel in wildlife industries. (Total notional time: 240 hours)

WILDLIFE MANAGEMENT II (WMG206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module covers the management principles of large predators, mega-herbivores and high-value game species within the contest of behaviour, intensive and extensive ranching systems, genetics, nutrition and diseases, that are fundamental core competencies for wildlife managers within the wildlife ranching industry. (Total notional time: 240 hours)

WILDLIFE MANAGEMENT III (WMG107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Veld Management and History of vegetation description and analysis; Plant Communities, Phytosociology and classification; Vegetation classification and mapping; Floristic parameters measured in the field; Vegetation Sampling - subjective versus objective and descriptive versus quantitative; Field measurement techniques and field data collection as well as Statistics and Vegetation monitoring. This module serves to resolve problems and introduce change within the area of Veld Management, Phytosociology and Plant Classification on a Game Ranch. (Total notional time: 240 hours)

WILDLIFE SCIENCE I (WLS105D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module examines wildlife population dynamics and monitoring of wildlife populations. The module also includes an introduction to the feeding anatomy and physiology of different game species, supplementary feeding, reproductive cycles of game species and genetic principles and implications on a game ranch. These are fundamental core competencies for game ranchers and resource managers in the game industry and provide support to further studies in the field of Wildlife Management. (Total notional time: 240 hours)

WILDLIFE SCIENCE II (WLS206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module examines the principles of animal behaviour, including habitat selection, and social, feeding and reproductive behaviour, and how these can be applied in the management of a game farm. The module includes a general introduction to ethology, and the behavioural mechanisms influencing animal distribution and density, with a view to detection and interpretation for tourism. In addition, the module also includes an introduction to social behaviour and groupings. These are fundamental core competencies for game farmers and resource managers in the conservation and game industry and provide support to further studies in the field of Wildlife Management. (Total notional time: 240 hours)

WILDLIFE SCIENCE III (WLS107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

Animal nutrition, home range use, spacing patterns, foraging and selectivity; species selection and reproduction on game farms; predation and ecological principles of predator management as well as wildlife disease ecology. Wildlife Science III contributes to an improved understanding of protected area management, more specifically with respect to the digestive physiology of ungulates, water requirements of wildlife, activity patterns and home range use, predator management and the ecology of wildlife diseases. (Total notional time: 240 hours)

WILDLIFE TECHNIQUES I (WTQ107V) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module contributes towards an integrated understanding of planning, infrastructure development and maintenance of infrastructure for wildlife undertakings. The module also contributes to a detailed understanding of the nature and extent of the South African wildlife industry and role-players and form core competencies for game ranch middle managers and other technical personnel in the wildlife industries. This core learning module covers ancillary wildlife techniques for design, construction and maintenance of game farms and reserves including the Biological Environment; Physical Environment; Project Management and Planning as well as Wildlife Disease Epidemiology and Control. (Total notional time: 180 hours)

WILDLIFE UTILIZATION I (WUT206D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Nature Conservation)

This module contributes towards the understanding of how to effectively utilise game farms and nature reserves, and focus on both consumptive and non-consumptive utilisation, which are fundamental core competencies for game farmers and wildlife ranching managers. (Total notional time: 120 hours)

WORK-INTEGRATED LEARNING (WDA105C) **WORK-INTEGRATED LEARNING**

(Module custodian: Department of Sport, Rehabilitation and Dental Sciences)

Practical application in a work situation of theoretical modules in the first year. (Total notional time: 360 hours)

WORK-INTEGRATED LEARNING I (EXPH601) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Physics)
Observing industrial working conditions. Safety measures at work and reports on work. Sample preparation. Principles of operating various kinds of equipment. Taking measurements and readings on working samples. Using industrial Geiger Muller radiation counter. Procedures and measurements in film coating on lenses. Industrial vacuum creating: pumps and gauges. Safe handling of radioactive sources; application of various industrial lasers. Monitoring of radioactive sources, NDT techniques in operations. (Total notional time: 600 hours)

WORK-INTEGRATED LEARNING I (WNC306D, WWI306D) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Nature Conservation)
Practical understanding of the principles involved in setting up an ecological management plan for a conservation area associated with work-integrated learning. Ability to apply the key terms, concepts, facts, principles, rules and theories of conservation to unfamiliar but relevant contexts; and knowledge of areas of specialisation. (Total notional time: 1200 hours)

WORK-INTEGRATED LEARNING: WATER SCIENCE AND TECHNOLOGY (WIL316D) **WORK-INTEGRATED LEARNING**
(Module custodian: Department of Environmental, Water and Earth Sciences)
Work-Integrated Learning will be done with an accredited employer and is overseen by a mentor and departmental lecturer. A compulsory syllabus will be followed and monthly reports and a final assignment must be submitted. Students will be visited at their place of employment and will be subjected to an oral assessment. (Total notional time: 600 hours)