



UNIVERSITY OF  
ZULULAND

# HANDBOOK 2021

## FACULTY OF SCIENCE AND AGRICULTURE

- Undergraduate -



# **UNIVERSITY OF ZULULAND**

## **FACULTY OF SCIENCE AND AGRICULTURE**

**2021**

## **UNDERGRADUATE PROSPECTUS**

### **Vision**

To be a leading Faculty of Science and Agriculture, nationally and globally, in a rural-based, comprehensive University, providing quality career focussed programmes through teaching, research, scholarship and community outreach.

### **Mission**

1. To provide access to students from diverse backgrounds to an enabling and caring learning and teaching environment.
2. To respond to the global demand for human resource development by training graduates in relevant programmes.
3. To generate knowledge through research in the pure and applied sciences and to disseminate it through publications, teaching and development, in partnership with the community and other constituencies.

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## INTRODUCTION AND OVERVIEW

The Faculty of Science and Agriculture, herein called the Faculty, is one of four Faculties at the University of Zululand. It consists of thirteen academic departments and a Science Access Department:

Agriculture  
Biochemistry and Microbiology  
Botany  
Chemistry  
Computer Science  
Consumer Sciences  
Geography and Environmental Studies  
Human Movement Science  
Hydrology  
Mathematical Sciences  
Nursing Science  
Physics and Engineering  
Science Access  
Zoology

## Change of Codes

As of 2019 the programme and modules codes were changed from "S" to "4". Programmes have changed for example: SBSC01 has become 4BSC01 and modules SZOL111 has become 4ZOL111. Note: Senior students will continue with the "S" codes.

## Qualifications

The Faculty offers the following qualifications:

### UNDERGRADUATE QUALIFICATIONS (all semesterised).


The following undergraduate programmes are offered by the Faculty:

- (a) A three-year **double major programme** leading to the award of a B.Sc. degree. This permits students to study certain combinations of disciplines in accordance with their interests and requirements. Curricula are designed so that graduates are equipped with the necessary skills to pursue careers in various fields.
- (b) A three-year **focussed programme** leading to the following degrees:  
B. Consumer Science (Hospitality and Tourism).
- (c) A four-year **focussed programme** leading to the following degrees:  
B.Sc. Agriculture (Plant Science),  
B.Sc. Agriculture (Animal Science),  
B.Sc. Agriculture (AGRIBUSINESS AND MANAGEMENT),  
B. Consumer Science (Extension and Rural Development), and  
B.N. (Bachelor of Nursing) – **No new first year entrants** – only existing pipeline students
- (d) A three-year **diploma programme** leading to the following diplomas:  
Diploma in Sport and Exercise Technology  
Diploma in Hospitality Management

All the above qualifications are accredited by the Council on Higher Education (CHE) and registered with the South African Qualifications Authority (SAQA) and relevant Professional bodies i.e. HPCSA and SANC.

Students are advised that even though a module or programme may be included in this Handbook the Faculty of Science and Agriculture is not compelled to offer it.

The **Rules** and **Syllabi** sections contain outlines of each qualification and programme offered by the Faculty.



## Career Opportunities

Among potential employers of graduates are the commercial and industrial sectors, the education sector, healthcare sector, government departments and research institutes. Please contact individual departments for information on career opportunities in specific fields.

## Meanings of Terms Used

<b>Module</b>	Unit of study. Each such unit is given a code. The code structure is as follows:
<b>First letter</b>	Faculty indicator (4 = Science and Agriculture).
<b>Next three letters</b>	Department or discipline indicator (BOT = Botany, CHM = Chemistry, etc.).
<b>First number</b>	Year-level (1, 2, 3 or 4).
<b>Second number</b>	Numeric to distinguish between modules offered in the same year and semester (1, 2, 3, etc.).
<b>Third number</b>	Semester (1 = first semester, 2 = second semester, 0 = module offered in both semesters, 9 = year length module).
<b>Elective (module)</b>	A module selected from a given list.
<b>Prerequisite</b>	A module which must be passed before the registration of a module having the prerequisite.
<b>Co-requisite</b>	A module which must be passed before, or registered together with, the module having the co-requisite.
<b>Curriculum</b>	The modules that comprise a qualification.
<b>Programme</b>	A structured curriculum leading to a qualification.
<b>Assessment</b>	The evaluation of a student's work in a module. This will include a combination of tests, seminars, assignments, projects, examinations (formal official evaluations) and other methods.
<b>Continuous Assessment Mark (CAM)</b>	The mark awarded to a student and arises from assessments conducted within a module but excludes the final summative examination. The syllabus for each module indicates how the CAM mark is calculated.
<b>Notional study hours</b>	The learning time required for a student of average ability to meet the outcomes for a module.
<b>Credit points (credits)</b>	One credit point is the value assigned to ten notional study hours of learning and assessment.
<b>Major</b>	In a discipline consists of: 64 credits, modules in that discipline are at year-level 3, At least 30 credits, modules in that discipline are at year-level 2, and At least 30 credits, modules in that or in closely allied disciplines are at year-level 1.
<b>Senate</b>	The Senate of the University of Zululand.
<b>University</b>	University of Zululand.
<b>Year of study</b>	A student will be deemed to be in the (a) <i>First year of study</i> If: s/he has not yet obtained a minimum of 64-degree credit points (b) <i>Second year of study</i> If S/he has obtained at least 64-degree credit points but has not yet achieved a minimum of 180-degree credit points (c) <i>Third year of study</i> If, either



- (i) in a three year programme, s/he has obtained 180-degree credit points
- (ii) in a four year programme, s/he has obtained at least 180-degree credit points but has not yet achieved a minimum of 300-degree credit points.
- (d) *Fourth year of study* if s/he is in a four-year programme and has passed a minimum of 300 degree credit points.

### Curriculum Design

- (a) Each subject is made up of a number of modules each having a credit rating based on the number of lectures, practical's, tutorials and other related learning activities. A semester-long module is usually worth 16 credit points.
- (b) All three-year degrees and diplomas require at least 384 credit points and all four-year degrees require at least 480 credit points. A student normally takes 120 credit points per year.
- (c) The choice of modules for a programme is subject to the constraints of the timetable.
- (d) Some modules have prerequisite and/or co-requisite requirements. These are listed under **Syllabi** below.
- (e) Curricula must be designed to lead to year-level 2 and year-level 3 modules which are necessary for the completion of a qualification.
- (f) In Double Major qualifications the first year of study students usually take modules in four different disciplines. At the second level of study students must choose modules from two, three or four different subjects (major subjects) from which they will then take two subjects as majors in their third year.
- (g) In Focussed Programmes, students will follow a fixed curriculum that specifies which modules are taken and in what sequence they are taken.

### Procedure for External Moderation / Examination

#### DEPARTMENTAL REVIEWS

Each department in the Faculty of Science and Agriculture will be reviewed by an External Reviewer(s) on a periodic basis. The External Reviewer(s) will be academic staff member(s) from a similar department at another university and qualified industry representative(s) who have a wide knowledge of the discipline offered by the department. External Reviewers will be appointed by the Faculty Board for a particular review. The minimum qualifications of reviewers will be a PhD in a field directly relevant to the department being reviewed; Reviewers who are or have been Heads of Department are preferred. The External Reviewer(s) will be expected to spend at least two days at the University and will assess the following aspects of Departmental activities:

1. Content of programmes offered.
2. Content of the modules offered.
3. Student study guides / work schedules.
4. Assessments: standard, variety, mark allocation, applicability, fairness of marking, etc.
5. General academic administration of department.
6. Identification of weak and / or strong areas concerning the department.
7. Department productivity (Research and Community Service).

## 8. Departmental equipment and facilities.

The External Reviewer(s) will submit a written report to the Dean of the Faculty with recommendations of how possible weak areas can be corrected. The Dean will implement appropriate action in conjunction with or after the review in consultation with departmental staff members.

All final-year modules will have their final examination papers and completed scripts sent to external examiners approved by the Faculty Board for moderation and review.

All other modules will have their final examination papers moderated internally for review.

## **Recognition of Prior Learning**

### **RECOGNITION OF COURSES PASSED AT OTHER INSTITUTIONS**

The onus to apply for recognition of courses passed elsewhere, to be used as credit for a degree at the University of Zululand, rests on the candidate in accordance with University rules found in the general calendar. This is done through the Student Affairs Section. Heads of Departments at the University of Zululand will, on request, evaluate the relevant courses. The candidate must supply any information needed to evaluate each course e.g. the prospectus or course descriptions as published by the former institution. Only after the faculty board has approved the applications will they be entered on the students' record. If a course is not approved the student has to do the relevant modules at the University of Zululand.

## **Learner Guides / Mode of Delivery**

Every student will receive a learner guide for each module that will be distributed as a hardcopy or a soft copy online.

This document will contain at least the following information:

1. Title and code of the module.
2. Brief description of the module.
3. The learning outcomes to be reached in the module.
4. Details of the Lecturer / s who present the module.
5. All details of the study material for the module and where it is available.
6. A module time schedule, e.g., what work will be covered per week, when assessments take place or when work needs to be handed in, etc.
7. A description of the assessment methods and assessment criteria, the schedules for assessments and a breakdown of the composition of the final mark for the module.
8. How feedback of assessments is to be given to students.

The content may be delivered face –to – face using the traditional classroom structure or virtually using an on online platform. Students further need to have compatible devices in order to participate in all virtual learning platforms and activities.

## **Format of Cover for Examination Papers**

All Examination papers must contain the following information:

**UNIVERSITY OF ZULULAND  
FACULTY OF SCIENCE AND AGRICULTURE**

**DEPARTMENT OF ... ..**

*Type of Assessment (e.g., Assessment 1, Final Assessment, etc.)*

**MODULE CODE AND TITLE**

Examiner

:

Internal Moderator

External Examiner/Reviewer

:

DURATION:

DATE:

TOTAL MARKS:

---

Instructions: ... ..

## Matriculation Points System

The Faculty has adopted the matriculation points system as used by the Central Applications Office and other Universities as part of the entrance requirements for qualifications in the Faculty. Points are awarded as follows:

### Under the old (pre 2008) matriculation system (only using the six best results)

Higher Grade			Standard Grade		
A	>80%	8 points	A	>80%	6 points
B	70-79%	7 points	B	70-79%	5 points
C	60-69%	6 points	C	60-69%	4 points
D	50-59%	5 points	D	50-59%	3 points
E	40-49%	4 points	E	40-49%	2 points
F	33-40%	3 points	F	33-40%	1 point

### Under the new National School Certificate (2008 onwards) (only using the six best subjects and excluding Life Orientation)

Level 7	>80%	7 points
Level 6	70-79%	6 points
Level 5	60-69%	5 points
Level 4	50-59%	4 points
Level 3	40-49%	3 points
Level 2	30-39%	2 points
Level 1	<30%	1 point

### TIMETABLE FOR UNDERGRADUATE SCIENCE COURSES

The University follows a standardised timetable structure which for the Faculty of Science and Agriculture is organised such that each module is allocated three 50-minute lecture periods and one three-hour practical period per week. There are eight timetable groups; these are labelled alphabetically (A to H). These groups are distributed according to the following schedule. No student may register in any semester for more than one course in any of these groups.

Time	M ON DA Y	TU ES DA Y	WE DN ES DA Y	TH UR SD AY	FR ID AY
7h30 to 8h20	A	D	B	E	C
8h20 to 8h30					
8h30 to 9h20	B	E	C	A	D
9h20 to 9h30					
9h30 to 10h20	C	A	D	B	E
10h20 to 10h30					
10h30 to 11h20	F	F	G	H	F
11h20 to 11h30					
11h30 to 12h20	G	PA	PD	PB	G
12h20 to 12h30					
12h30 to 13h20	H				H
13h20 to 13h30					
13h30 to 14h20	PC	PF	PG	PH	PE
14h20 to 14h30					
14h30 to 15h20					
15h20 to 15h30					
15h30 to 16h20					
16h20 to 16h30					
16h30 to 17h30					

The timetable has been arranged such that for all of the recommended double-major combinations and for all of the focussed programmes there are no timetable clashes. If however, students need to take courses from different year-levels as a result of failing modules, then clashes might occur. In all cases such as these, the student must take the lower year-level course in preference to the higher year-level course.

## FACULTY RULES

The Faculty and Departmental Rules contained in this Handbook and the relevant General Academic Rules of the University are applicable to all students registered in the Faculty of Science and Agriculture. Unless otherwise stated, any exceptions to these rules require the approval of the Faculty Board. In all instances, Departmental Rules may not relax the requirements stipulated in the Faculty Rules, and Faculty Rules may not relax the requirements stipulated in the General Rules. Departmental Rules may only replace Faculty Rules which in turn replace General Rules in instances where more stringent requirements are specified.

### A UNDERGRADUATE QUALIFICATIONS

#### S1 ENTRY REQUIREMENTS

Please note that the achievement of the minimum requirements for admission does not guarantee an applicant admission to the Faculty. Applications should be channelled through the Central Applications Office and offers will be made taking into account the academic achievements of applicants and the available spaces in the courses of study.

##### S1.1 Streams for all B.Sc. Programmes

The faculty offers entry to one of three academic streams.

The **Mainstream** allows direct entry to the regular B.Sc. programmes and students in this stream will be assumed to be adequately prepared for University level study, and should therefore be in a position to complete the programme in the minimum time prescribed for the qualification.

The **Augmented** stream (see rule S17.1) will enable students to complete the first academic year over a period of two years and they will receive substantial additional tuition and support. This stream will add an additional year to the minimum time required for the completion of a programme.

The **Foundation** stream (see rule S17.2) will enable students to spend their first year in a dedicated programme designed to improve their academic grounding. This stream will add an additional year to the minimum time required for the completion of a programme.

##### S1.2 Under the former Senior Certificate Examinations (completed prior to 2008)

The minimum requirements for entry into the **B.Sc. programmes**

#### (a) **Mainstream**

- (i) A full matriculation endorsement, exemption or conditional exemption or its approved foreign equivalent,
- (ii) A minimum of 30 matriculation points,
- (iii) A pass of at least 50 % (D symbol) at the higher grade (HG) or 60% (C symbol) at the standard grade (SG) in Mathematics. For programmes that require Calculus 1 (4MTH111) and Calculus 2 (4MTH112) the minimum requirement for Mathematics at the higher grade (HG) is 60% (C symbol) and at standard grade (SG) is 70% (B symbol), and
- (iv) A pass of at least 50% (D symbol) at the higher grade (HG) or 70% (B symbol) at the standard grade (SG) in at least one of Computer Studies, Physical Science, Biology or Agriculture.

#### (b) **Augmented Stream**

Candidates who do not satisfy (a) (ii) and/or (a) (iii) and/or (a) (iv) and/or (a) (v) above, but have at least 28 matriculation points and a minimum 40%(E symbol) at the higher grade (HG) or 60% (C symbol) at the standard grade (SG) in mathematics and in one of

Computer Studies, Physical Science, Biology or Agriculture may be placed in the Science Augmented stream.

(c) **Foundation Stream**

Candidates who do not satisfy (a) and (b) but have a full matriculation endorsement, exemption or conditional exemption or its approved foreign equivalent, with at least 26 matriculation points and have attempted Mathematics and at least one of Computer Studies, Physical Science, Biology or Agriculture may be placed in the Science Foundation stream.

(d) The minimum requirements for entry into the **Consumer Sciences programmes** are:

**B. Consumer Science (Extension and Rural Development)**

- (i) a full matriculation endorsement, exemption or conditional exemption or its approved foreign equivalent,
- (ii) a minimum of 30 matriculation points,
- (iii) A pass in Biology or Physiology of at least 40% (E symbol) at the higher grade (HG) or 50% (D symbol) at the standard grade (SG), and
- (iv) A pass in English of at least 40% (E symbol) at the higher grade (HG) or 50% (D symbol) at the standard grade (SG).

**B. Consumer Science (Hospitality and Tourism)**

- (i) A full matriculation endorsement, exemption or conditional exemption or its approved foreign equivalent,
- (ii) A minimum of 26 matriculation points, and
- (iii) A pass in English of at least 40% (E symbol) at the higher grade (HG) or 50% (D symbol) at the standard grade (SG).

(e) **Bachelor of Nursing – will only be offered to existing pipeline students**

***(No new first year entrants- programme phasing out)***

- (i) A full matriculation endorsement, exemption or conditional exemption or its approved foreign equivalent, A minimum of 30 matric points,
- (ii) A pass in English of at least 40% (E symbol) at the higher grade (HG) or 50% (D symbol) at the standard grade (SG), and
- (iii) A pass in Biology of at least 40% (E symbol) at the higher grade (HG) or 50% (D symbol) at the standard grade (SG).

(f) The minimum requirements for entry into the **Diploma in Sport and Exercise Technology** are

- (i) A matriculation certificate or a school leaving certificate issued by the Joint Matriculation Board or a Senior Certificate issued by any of the authorized examining authorities.

**Vertical articulation from Diploma in Sport and Exercise Technology to BSc. Human Movement Science Degree**

- (ii) NSC with a pass of at least 50% (level 4) in mathematics, life sciences & physical sciences;
- (iii) sciences;
- (iv) An average of 60% for the three-year Sport and Exercise Technology diploma programme.

(g) The minimum requirements for entry into the **Diploma in Hospitality Management** are

- (i) A matriculation certificate or a school leaving certificate issued by the Joint Matriculation Board or a Senior Certificate issued by any of the authorized examining authorities.

- (ii) A pass in English of at least 40% (E symbol) at the higher grade (HG) or 50% (D symbol) at the standard grade (SG).

### **S1.3 Under the New National Senior Certificate Examinations (as from 2008 grade 12)**

#### **S1.3.1 Minimum requirements for entry into the B.Sc. programmes:**

Note 1: Mathematical Literacy is not deemed acceptable for direct entry into a B.Sc. programme.

Note 2: Life Orientation is not considered when calculating entrance points.

Note 3: In a case where more than 7 subjects were taken, only the best 6 will be considered.

Note 4: Where majors are chosen from different groupings below (groups (a) to (f)), both sets of entrance criteria must be achieved.

#### **(a) Mainstream (Applied Mathematics, Mathematics or Statistics as a major)**

- (i) A National Senior Certificate (NSC) with passes allowing entry to degree studies is required. (NSC-Deg) or its approved foreign (equivalent).
- (ii) A minimum of 28 NSC points.
- (iii) A pass of at least 60% (level 5) in Mathematics.
- (iv) A pass of at least 50% (level 4) in English.
- (v) A pass of at least 50% (level 4) in Physical Sciences.

#### **(b) Mainstream (Physics or Chemistry as a major)**

- (i) A National Senior Certificate (NSC) with passes allowing entry to degree studies is required. (NSC-Deg) or its approved foreign (equivalent).
- (ii) A minimum of 28 NSC points.
- (iii) A pass of at least 60% (level 5) in Mathematics.
- (iv) A pass of at least 50% (level 4) in English.
- (v) A pass of at least 50% (level 4) in Physical Sciences.

#### **(c) Mainstream (Biochemistry, Microbiology, Botany, Human Movement Science or Zoology as a major)**

- (i) A National Senior Certificate (NSC) with passes allowing entry to degree studies is required. (NSC-Deg) or its approved foreign equivalent,
- (ii) A minimum of 28 NSC points,
- (iii) A pass of at least 50% (level 4) in Mathematics.
- (iv) A pass of at least 50% (level 4) in English
- (v) A pass of at least 50% (level 4) in Life Sciences or Agricultural Science.
- (vi) A pass of at least 40% (level 3) in Physical Science

#### **(d) Mainstream (Agriculture)**

- (i) A National Senior Certificate (NSC) with passes allowing entry to degree studies is required. (NSC-Deg) or its approved foreign equivalent,
- (ii) A minimum of 28 NSC points,
- (iii) A pass of at least 50% (level 4) in Mathematics.
- (iv) A pass of at least 50% (level 4) in English
- (v) A pass of at least 50% (level 4) in Agricultural Science or Life Sciences.
- (vi) A pass of at least 40% (level 3) in Physical Science

#### **(e) Mainstream (Geography as a major)**

- (i) A National Senior Certificate (NSC) with passes allowing entry to degree studies is required. (NSC-Deg) or its approved foreign (equivalent).
- (ii) A minimum of 28 NSC points.



- (iii) A pass of at least 50% (level 4) in Mathematics.
- (iv) A pass of at least 50% (level 4) in English.
- (v) A pass of at least 50% (level 4) in Life Sciences or Physical Sciences.
- (vi) A pass of at least 50% (level 4) in Geography.

**(f) Mainstream (Hydrology as a major)**

- (i) A National Senior Certificate (NSC) with passes allowing entry to degree studies is required. (NSC-Deg) or its approved foreign (equivalent).
- (ii) A minimum of 28 NSC points.
- (iii) A pass of at least 50% (level 4) in Mathematics.
- (iv) A pass of at least 50% (level 4) in English.
- (v) A pass of at least 50% (level 4) in Physical Sciences.

**(g) Mainstream (Computer Science as a major)**

- (i) A National Senior Certificate (NSC) with passes allowing entry to degree studies is required. (This is referred to as a NSC-Deg) or it's approved foreign (equivalent).
- (ii) A minimum of 28 NSC points.
- (iii) A pass of at least 60% (level 5) in Mathematics.
- (iv) A pass of at least 50% (level 4) in English.
- (v) A pass of at least 50% (level 4) in Physical Sciences.

**(h) Augmented Stream**

Candidates who do not satisfy the requirements for direct entry to a B.Sc. programme (a-g above), but have a National Senior Certificate (NSC) with pass allowing entry to degree studies (NSC-Deg) or its approved foreign equivalent, and have at least 28 NSC points and the following:

**Life Science**

- (i) Have attained a minimum of 40% (level 3) in Mathematics.
- (ii) Have attained a minimum of 40% (level 3) in one of Agricultural Science or Life Sciences
- (iii) Have attended a minimum of 40% (level 3) in Physical Sciences.
- (iv) Have attained at least 40% (level 3) in English as First Additional Language or 50% (level 4) in English Home Language.

**Physical Science**

- (i) Have attained a minimum of 40% (level 3) in Mathematics.
- (ii) Have attained a minimum of 40% (level 3) in one of Physical Sciences.
- (iii) Have attained at least 40% (level 3) in English as First Additional Language or 50% (level 4) in English Home Language.

**(i) Foundation Stream**

Candidates who do not satisfy the requirements for direct entry to a B.Sc. programme (a through to h(ii) above) but do have a National Senior Certificate (NSC) with pass allowing entry to degree studies (NSC-Deg) or its approved foreign equivalent, and have at least 26 NSC points may be accepted provided they also have the following:

- (i) Have at least 40% (level 3) in Mathematics.
- (ii) Have at least 40% (level 3) in at least one of the following Agricultural Science or Life Sciences
- (iii) Have at least 40% (level 2) in Physical Science
- (iv) Have attained at least 40% (level 3) in English First Additional Language or 50% (level 4) in English Home Language may be placed in the Science Foundation stream.

### **S1.3.2 Minimum requirements for entry into the Consumer Sciences programmes:**

- (a) **B. Consumer Science (Extension and Rural Development)**
- (i) A National Senior Certificate (NSC) with passes allowing entry to degree studies is required. (This is referred to as a NSC-Deg) or its approved foreign equivalent,
  - (ii) a minimum of 28 NSC points, and
  - (iii) A pass of at least 50% (level 4) in English and Life Orientation.
  - (iv) A pass of at least 50% (level 4) in Life Sciences or Agricultural Science
- (b) **B. Consumer Science (Hospitality and Tourism)**
- (i) A National Senior Certificate (NSC) with passes allowing entry to degree studies is required. (This is referred to as a NSC-Deg) or its approved foreign equivalent,
  - (ii) A Minimum of 28 NSC points, and
  - (iii) A pass of at least 50% (level 4) in English and Life Orientation

### **S1.3.3 Minimum requirements for entry into Diploma programmes:**

- (a) **Diploma in Sport and Exercise Technology**
- (i) A pass in the National Senior Certificate (NSC-Dip) with at least 26 NSC points,
  - (ii) A pass of at least 40% (level 3) in four recognized NSC 20-credit subjects,
  - (iii) A pass of at least 40% (level 3) for English as First Additional Language or a pass of at least 50% (level 4) for English as Home language.
- (b) **Diploma in Hospitality Management**
- (i) a pass in the National Senior Certificate (NSC-Dip) with at least 26 NSC points,
  - (ii) a pass of at least 40% (level 3) in four recognized NSC 20-credit subjects,
  - (iii) A pass of at least 50% (level 4) for English and Life Orientation.

## **S2 REGISTRATION RESTRICTIONS**

- (a) Candidates may register for a module only if all prerequisite requirements for that module have been satisfied.
- (b) In all semesters of registration, for undergrad degree programs the maximum load will be 64 credits (4 modules of 16 credits each). Students who have passed at least 7 modules in their previous academic year, and require only one additional module to complete their degree, may register for one additional module in one of the semesters of their final year of study. Any deviation from this will require the approval of the Dean. Please note that the compulsory computer literacy and UNIZULU101 modules where they are included in the first year curricula do not contribute to the maximum number of modules stated above.
- (c) For augmented programmes candidates may not register for more than 3 modules (16 credits each) per semester for the first two years and may not repeat a module more than once.
- (d) Students may only register for
- (i) Year-level 2 modules after they have obtained at least 64 credits at year-level 1 including 32 credits which are compulsory for their chosen programme or major, and
  - (ii) Year-level 3 modules after they have passed all year-level 1 modules and at least four year-level 2 modules (64 credits) including 32 credits which are compulsory for their chosen programme or major.

At registration, students must register for outstanding year-level 1 modules before they register for any year-level 2 modules and they must register for outstanding year-level 2 modules before they register for any year-level 3 modules.

- (e) Students who have failed any module more than one time will need the approval of the Dean before they can register for this module for a further attempt.
- (f) Any module published in this prospectus may, in any particular year, not be offered if the demand for the module does not warrant it or if qualified staff to teach it are not available. Students may defer their registration for this module to the following year or an appropriate module will be officially offered in its place.

### S3 ASSESSMENT

**(a) Assessment types**

- (i) Continuous assessment marks (CAM) derived from assignments, practical's, tests and other activities while a module is being taught,
- (ii) Final examinations conducted at the end of a module,
- (iii) Re-examinations conducted subject to admittance after the final mark of a module is determined,
- (iv) Aegrotat examinations held if special circumstances prevented a student from attending final examinations, and
- (v) Special examinations held to enable a student to graduate if the examination is passed.

**(b) Continuous assessment mark (CAM)**

The components that contribute to the CAM for each module and the requirements for admittance to the final examination, *the Duly Performed (DP) requirement*, for each module are indicated in the syllabi of each module.

**(c) Final Examinations**

There shall be two periods for final examinations, one at the end of each semester.

- (i) The final examinations for a module normally comprise a final written or computer based examination. Some modules may include a final practical examination and research based modules are assessed through the production of a research report.
- (ii) A subminimum of 40% is required for each of the final examinations in a module.

**(d) Re-Examinations**

Re-examinations are held to allow a student who failed a module by a small margin to re-attempt the examination. The primary purpose of such an examination is to confirm whether a student has or has not met the outcomes specified for the module. The exam is treated as a separate entity and the continuous assessment mark is not used in the determination of the final mark.

There shall be a re-examinations period each semester after the final examinations have been completed. These examinations are normally written but may include oral and/or practical components.

- (i) Candidates who fail a module with a final mark of between 40% and 48% shall be permitted to write a re-examination in that module.
- (ii) Students who write re-examinations in a module may not be awarded a final mark for that module of more than 50 %.
- (iii) Students who write re-examinations will have their re-examination mark recorded separately on their academic record.

- (iv) No further examination (re-examination or Aegrotat examination) will be granted after the completion of the re-examinations period. (i.e. the module must be registered again in a subsequent year).

**(e) Aegrotat examinations**

The General rules for admission to an Aegrotat examination apply.

**(f) Special Re-examinations**

Please refer to the General rules.

**(g) Final Mark Calculations**

- (i) The final mark for a module is derived from the CAM and the final examination (or Aegrotat examination) mark.
- (ii) The CAM may not comprise more than 50% of the final mark.
- (iii) A final mark of below 50% constitutes a fail.
- (iv) Re-examinations and Special Re-examinations may not result in a final mark of more than 50%.
- (v) The General Rules that relate to the classification of the final mark of a module (distinction, merit, pass) apply.

**S4 ATTAINMENT AND CONFERMENT OF DEGREE**

- (a)** A qualification must be completed in no more than two years beyond the minimum prescribed time for that qualification. Only years that have been registered are used in determining the number of years taken by a student.
- (b)** Students who have satisfied all of the academic requirements of a programme, including all of the compulsory modules specified for that qualification, will be deemed to have completed the degree.
- (c)** The conferral of the degree at a graduation ceremony will only occur once all administrative and financial requirements have been met in addition to the academic requirements.
- (d)** The General Rules that relate to the classification of a degree (distinction, first class etc.) apply.
- (e)** The General Rules that relate to the attainment and conferment of degrees apply.

**S5 EXCLUSION RULES**

Students who fail to obtain the minimum number of credits at the end of each semester, as tabulated below, and are unable to propose an academic plan acceptable to the Dean to address their slow progress, shall be excluded from the Faculty.

SE M	MAINSTREAM	AUGMENTED	YEA R
1	32 (2 semester modules)	32 (2 semester modules)	1
2	64 (4 semester modules)	64 (4 semester modules)	
3	96 (6 semester modules)	96 (6 semester modules)	2
4	144 (9 semester modules)	128 (8 semester modules)	
5	177 (11 semester modules)	160 (10 semester modules)	3
6	224 (14 semester modules) (64 at level-2)	192 (12 semester modules) (32 at level-2)	
7	256 (16 semester modules)	224 (14 semester modules)	4
8	304 (19 semester modules) (96 at level-2 and 48 at level-3)	256 (16 semester modules) (96 at level-2 or level-3)	
9	336 (21 semester modules)	288 (18 semester modules)	5
10	384 (24 semester modules) <b>(3-year qualification complete)</b> (4-year qualification: 90 at level-3)	320 (20 semester modules) (64 at level-3)	
11	420 (28 semester modules)	330 (22 semester modules)	6
12	480 (32 semester modules) <b>(4-year qualification complete)</b>	384 (24 semester modules) <b>(3-year qualification complete)</b> (4-year qualification: 90 at level-3)	
13		420 (28 semester modules)	7
14		480 (32 semester modules) <b>(4-year qualification complete)</b>	

- (a) The number of semesters spent in other universities or faculties may be used in the above calculations.
- (b) The University General rules apply for any appeals of exclusion

## **S6 TRANSITION FROM PRE-2007 to POST-2008 QUALIFICATIONS**

The Faculty has phased out all qualifications based on term-length 8 credit modules that were offered prior to 2008. As from 2008, these have been replaced by qualifications based on semester-length 16 credit modules.

- (a) Since the pre-2008 qualifications are no longer accredited, students who wish to register will have to do so under the new qualifications, starting from the first year.

## **S7 STRUCTURE OF QUALIFICATIONS**

The structure of qualifications in the Faculty as outlined below follow the Higher Education Qualifications Framework (HEQF) as published in the Government Gazette (30 August 2013).

### **S7.1 Undergraduate Diplomas**

- (a) The minimum duration of a three-year diploma is six semesters.  
The total credit value of a diploma is at least 360 credits provided that at least 120 credits are at NQF level 6  
The exit level of the Diploma is NQF 6

### **S7.2 Undergraduate Degrees**

- (a) The minimum duration of a three-year qualification is six semesters.

The total credit value of a three-year qualification is at least 384 credits, provided that at least 120 credits are at NQF level 7.

The exit level of these qualification is NQF Level 7

- (b) The minimum duration of a four-year qualification is eight semesters.

The total credit value of a four-year qualification is at least 480 credits, provided that at least 120 credits are at NQF level 8

The exit level of these qualifications is NQF level 8

- (c) Within any undergraduate degree offered by the Faculty, credits gained for the modules indicated in Column A in the table below may not be used together with credits gained for the paired modules indicated in Column B.

COLUMN A		COLUMN B	
4CHM111	General Chemistry 111	4CHM121	Basic Chemistry 121
		4CHM132	Chemistry for Consumer Sciences
4CHM112	General Chemistry 112	4CHM122	Basic Chemistry 122
		4CHM132	Chemistry for Consumer Sciences
4CHM121	Basic Chemistry 121	4CHM132	Chemistry for Consumer Sciences
4CHM122	Basic Chemistry 122	4CHM132	Chemistry for Consumer Sciences
4MTH111	Calculus I	4MTH122	Mathematics and Statistics for the Earth and Life Sciences
		4STT121	Mathematics and Statistics for Commerce Students
4MTH112	Calculus II	4MTH122	Mathematics and Statistics for the Earth and Life Sciences
		4STT121	Mathematics and Statistics for Commerce Students
4MTH122	Mathematics and Statistics for the Earth and Life Sciences	4STT121	Mathematics and Statistics for Commerce Students
4PHY111	Classical Mechanics and Properties of Matter	4PHY121	Classical Mechanics and Properties of Matter for Biological Sciences
		4PHY131	Physics for Consumer Sciences
4PHY112	Nuclear Physics, Electromagnetism, Modern Physics	4PHY122	Nuclear Physics, Electromagnetism, Modern Physics for Biological Sciences
		4PHY131	Physics for Consumer Sciences

4PHY121	Classical Mechanics and Properties of Matter for Biological Sciences	4PHY131	Physics for Consumer Sciences
4PHY122	Nuclear Physics, Electromagnetism, Modern Physics for Biological Sciences	4PHY131	Physics for Consumer Sciences
4CPS111	Introductory Computing	4CPS121	Computer Literacy I
		4CPS122	Computer Literacy II
4STT111	Elementary Statistics for Science Students	4STT121	Mathematics and Statistics for Commerce Students
		4STT122	Elementary Statistics for Commerce Students

## **S8 EXTERNAL CREDITS**

Modules passed at another University, if deemed equivalent by the Faculty Board, may count for up to a maximum of 50% of the candidate's curriculum. However, year-level 3 modules may not be substituted for those passed at any another University.

## **S9 COMMON CURRICULUM (DEGREE BASED ON MAJORS)**

Programmes offered in the Faculty are divided into three broad groups, the Life Sciences, the Physical & Mathematical Sciences and the Earth Sciences. In many cases students will pursue a qualification having majors that are in the same broad group but it is also possible for students to have majors from two different groups, provided that this combination is deemed acceptable by the Faculty and that it is possible to study the subjects within the timetable.

The Life Sciences group incorporates the disciplines of Biochemistry, Botany, Human Movement Science, Microbiology and Zoology.

The Physical and Mathematical Sciences group incorporates the disciplines of Applied Mathematics, Chemistry, Computer Sciences, Mathematics, Physics and Statistics.

The Earth Sciences group incorporates the disciplines of Geography and Hydrology.

## **S10 STRUCTURE OF DEGREE BASED ON MAJORS**

- i. 64 year-level 3 credits (NQF level 7) shall be in modules for each major subject.
- ii. At least 32 year-level 2 credits (NQF level 6) must be specified for each major.

## **S11 MAJOR SUBJECTS OFFERED BY THE FACULTY**

Applied Mathematics  
Biochemistry  
Human Movement Science  
Botany  
Chemistry  
Computer Science  
Geography  
Hydrology  
Mathematics  
Microbiology  
Physics  
Statistics  
Zoology



## S12 RULES FOR COMBINATION OF MAJORS

The Faculty of Science and Agriculture recommends 37 double major combinations as outlined below. No other combinations will be allowed.

Applied Mathematics and	Computer Science, Hydrology, Mathematics, Physics, or Statistics
Biochemistry and	Botany, Chemistry, Human Movement Science, Microbiology, or Zoology
Botany and	Biochemistry, Geography, Hydrology, Microbiology, or Zoology
Chemistry and	Biochemistry, Computer Science, Hydrology, Mathematics, Physics or Zoology
Computer Science and	Applied Mathematics, Chemistry, Hydrology, Mathematics, Physics or Statistics
Geography and Zoology	Botany, Hydrology, Physics, Statistics or
Human Movement and Science	Biochemistry, Microbiology, Physics or Zoology
Hydrology and	Applied Mathematics, Botany, Chemistry, Computer Science, Geography, Microbiology, Physics, Statistics or Zoology
Mathematics and	Applied Mathematics, Chemistry, Computer Science, Physics or Statistics
Microbiology and	Biochemistry, Botany, Human Movement Science, Hydrology or Zoology
Physics and	Applied Mathematics, Chemistry, Computer Science, Geography, Hydrology, Human Movement Science, or Mathematics
Statistics and Geography,	Applied Mathematics, Computer Science, Hydrology or Mathematics
Zoology and	Biochemistry, Botany, Chemistry, Geography, Human Movement Science, Hydrology or Microbiology

### S13 CURRICULA FOR RECOMMENDED DOUBLE MAJOR COMBINATIONS

The following tables outline the curricula of the 37 recommended double major combinations. Where elective choices are indicated by shading, a choice must be made between the specified options. NO other module may be used instead. Students are advised to choose their elective subjects taking into account their academic background and their interests.

Pre-requisites and Co-requisites are indicated and these must be adhered to.

The following substitute modules for modules indicated in the curricula as both modules to be taken and modules that are pre- and co- requisites are applied wherever they appear in all qualifications offered by the Faculty:

Module	Substitute Module(s)
4BOT111	4LBT111
4BOT112	4LBT112
4CHM111	4LCH111
4CHM112	4CH112
4CHM121	4CH121/4CHM111/4LCH111
4CHM122	4LCH122/4CHM112/4LCH112
4MTH111	4LMH111
4MTH112	4LMH112
4MTH122	4LMH122/4MTH111/4MTH112/4LMH111/4LMH112
4PHY111	4LPH111/4PHY121 with 60%/4LPH121 with 60%
4PHY112	4LPH112/4PHY122 with 60%/4LPH122 with 60%
4PHY121	4LPH121/4PHY111/4LPH111
4PHY122	4LPH122/4PHY112/4LPH112
4ZOL111	4LZL111
4ZOL112	4LZL112
4LBT111	4BOT111
4LBT112	4BOT112
4LCH111	4CHM111
4LCH112	4CHM112
4LCH121	4CHM121/4CHM111/4LCH111
4LCH122	4CHM122/4CHM112/4LCH112
4LMH111	4MTH111
4LMH112	4MTH112
4LMH122	4MTH122/4MTH111/4LMH111/4MTH112/4LMH112
4LPH111	4PHY111/4PHY121 with 60%/4LPH121 with 60%
4LPH112	4PHY112/4PHY122 with 60%/4LPH122 with 60%
4LPH121	4PHY121/4PHY111/4LPH111
4LPH122	4PHY122/4PHY112/4LPH112
4LZL111	4ZOL111
4LZL112	4ZOL112

In addition to these, if a module is in brackets in the tables below, it is a substitute module that may be used in place of the module immediately preceding it.

The timetable group for each module is indicated by a letter immediately after the module code. Students may not register for modules that clash on the timetable (i.e. the lower year level module must be registered)

M = Major subject  
C = Compulsory module  
E = Elective module

4BSC01 APPLIED MATHEMATICS AND COMPUTER SCIENCE						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	MATHEMATICAL SCIENCES AND COMPUTER SCIENCE					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	APPLIED MATHEMATICS			COMPUTER SCIENCE		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC01					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE OR INFO TECHNOLOGY					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
DISCRETE MATHEMATICS	4AMT111 G	M	16	5		4MTH111
CALCULUS I	4MTH111 F	C	16	5		
INTRODUCTORY COMPUTING	4CPS111 B	M	16	5		
EITHER CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	E	16	5		4MTH111
OR ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
FURTHER DISCRETE MATHEMATICS	4AMT122 G	M	16	6		4MTH112 4AMT111
CALCULUS II	4MTH112 F	C	16	6		4MTH111

INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	M	16	6		4CPS111
EITHER ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	E	16	6		
OR STATISTICS FOR SCIENCE STUDENTS	4STT112 E	E	16	6		4STT111 4MTH112
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
DYNAMICAL SYSTEMS & MATHEMATICAL MODELLING	4AMT211 E	M	16	6		4MTH221
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112	
DATA STRUCTURES AND ALGORITHMS	4CPS211 D	M	16	6	4CPS111 4CPS112	
COMPUTER COMMUNICATIONS & NETWORKS	4CPS231 A	C	16	6	4CPS111	
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO OPERATIONS RESEARCH	4AMT212 E	M	16	6	4AMT112	4MTH222
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	C	16	6		4MTH221
SOFTWARE ENGINEERING	4CPS212 D	M	16	6	4CPS112	4CPS211
DATABASE INFORMATION MANAGEMENT I	4CPS232 A	C	16	6	4CPS111	
<b>THIRD YEAR SEMESTER 1</b>						
TENSOR ANALYSIS	4AMT331 B	M	16	7	4AMT212	
APPLIED MATHEMATICAL METHODS	4AMT321 D	M	16	7	4AMT212	
ADVANCED PROGRAMMING TECHNIQUES	4CPS311 E	M	16	7	4CPS211 4CPS212	
SYSTEMS PROGRAMMING (OS & COMPILERS)	4CPS321 G	M	16	7	4CPS211 4CPS212	
<b>THIRD YEAR SEMESTER 2</b>						
ADVANCED CLASSICAL MECHANICS	4AMT312 B	M	16	7	4AMT212	
NUMERICAL METHODS	4AMT322 D	M	16	7	4AMT212	
DISTRIBUTED SYSTEMS DEVELOPMENT	4CPS312 E	M	16	7	4CPS211 4CPS212	
FINAL YEAR PROJECT	4CPS322 G	M	16	7	4CPS211 4CPS212	4CPS311 4CPS321

4BSC02 APPLIED MATHEMATICS AND HYDROLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	MATHEMATICAL SCIENCES AND HYDROLOGY					
DEGREE(DSIGNATOR)	BACHELOR OF SCIENCE					
MAJORS	APPLIED MATHEMATICS			HYDROLOGY		
ABBREVIATION	BSC					
UNIZULU CODE	4BSC02					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	C	16	5		
CALCULUS I	4MTH111 F	C	16	5		
DISCRETE MATHEMATICS	4AMT111 G	M	16	5		4MTH111
CLASSICAL MECHANICS AND PROPERTIES OF MATTER	4PHY111 A	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
INTRO TO GEOLOGY	4HYD112 D	M	16	6		
CALCULUS II	4MTH112 F	C	16	6		4MTH111
FURTHER DISCRETE MATHEMATICS	4AMT122 G	M	16	6		4MTH112 4AMT111

ELEMENTARY STATISTICS FOR COMMERCE STUDENTS	4STT122 C	C	16	6		
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	M	16	6	4GES111	
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112	
DYNAMICAL SYSTEMS & MATHEMATICAL MODELLING	4AMT211 E	M	16	6	4AMT122	4MTH221
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	C	16	6	4GES111	
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO SUBSURFACE HYDROLOGY	4HYD212 F	M	16	6	4HYD112	
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	C	16	6		4MTH221
INTRO TO OPERATIONS RESEARCH	4AMT212 E	M	16	6	4AMT122	4MTH222
GEOGRAPHICAL INFORMATION SYSTEMS	4HYD222 PE/PH	C	16	6		4GES211
<b>THIRD YEAR SEMESTER 1</b>						
SURFACE WATER HYDROLOGY	4HYD311 A	M	16	7	4HYD211 4STT122	
GROUNDWATER HYDROLOGY	4HYD321 C	M	16	7	4HYD212	
TENSOR ANALYSIS	4AMT331 B	M	16	7	4AMT212	
APPLIED MATHEMATICAL METHODS	4AMT321 D	M	16	7	4AMT212	
<b>THIRD YEAR SEMESTER 2</b>						
HYDROLOGICAL MODELLING	4HYD332 A	M	16	7	4HYD211 4HYD212	
WATER RESOURCES MANAGEMENT	4HYD342 C	M	16	7	4HYD211	
ADVANCED CLASSICAL MECHANICS	4AMT312 B	M	16	7	4AMT212	
NUMERICAL METHODS	4AMT322 D	M	16	7	4AMT212	

4BSC03 APPLIED MATHEMATICS AND MATHEMATICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	MATHEMATICAL SCIENCES					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	APPLIED MATHEMATICS			MATHEMATICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC03					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE OR INFO TECHNOLOGY OR LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
CALCULUS I	4MTH111 F	M	16	5		
DISCRETE MATHEMATICS	4AMT111 G	M	16	5		4MTH111
EITHER INTRODUCTORY COMPUTING	4CPS111 B	E	16	5		
OR CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	E	16	5		4MTH111
OR GENERAL CHEMISTRY 111	4CHM111 E	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
FURTHER DISCRETE MATHEMATICS	4AMT122 G	M	16	6		4MTH112 4AMT111

CALCULUS II	4MTH112 F	M	16	6		4MTH111
INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	C	16	6		4CPS111
EITHER ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	E	16	6		
OR GENERAL CHEMISTRY 112	4CHM112 E	E	16	6		4CHM111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
DYNAMICAL SYSTEMS & MATHEMATICAL MODELLING	4AMT211 E	M	16	6	4MTH122	4MTH221
ADVANCED CALCULUS	4MTH221 H	M	16	6	4MTH112	
DATA STRUCTURES AND ALGORITHMS	4CPS211 D	E	16	6	4CPS111	
EITHER MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4PHY211 C	E	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
OR DISTRIBUTION THEORY	4STT211 C	E	16	6	4STT112	4MTH221
OR COMPUTER COMMUNICATIONS NETWORKS	4CPS231 A	E	16	6		4CPS111
OR ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM211 G	E	16	6	4CHM111, 4CHM112 4MTH111	
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO OPERATIONS RESEARCH	4AMT212 E	M	16	6	4AMT122	4MTH222
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	M	16	6		4MTH221
SOFTWARE ENGINEERING	4CPS212 D	E	16	6	4CPS112	4CPS211
EITHER MODERN PHYSICS, PHOTONICS AND WAVES	4PHY212 C	E	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
OR DATABASE INFORMATION MANAGEMENT I	4CPS232 A	E	16	6		4CPS111
OR ORGANIC & PHYSICAL CHEMISTRY 2	4CHM212 G	E	16	6	4CHM111 4CHM112 4MTH111	
<b>THIRD YEAR SEMESTER 1</b>						
TENSOR ANALYSIS	4AMT331 B	M	16	7	4AMT212	
APPLIED MATHEMATICAL METHODS	4AMT321 D	M	16	7	4AMT212	
ABSTRACT ALGEBRA	4MTH311 A	M	16	7	4MTH222	
REAL ANALYSIS	4MTH321 C	M	16	7	4MTH222	



THIRD YEAR SEMESTER 2						
ADVANCED CLASSICAL MECHANICS	4AMT312 B	M	16	7	4AMT212	
NUMERICAL METHODS	4AMT322 D	M	16	7	4AMT212	
GRAPH THEORY	4MTH312 A	M	16	7	4MTH222	
COMPLEX ANALYSIS	4MTH322 C	M	16	7	4MTH222	

4BSC04 APPLIED MATHEMATICS AND PHYSICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	MATHEMATICAL SCIENCES AND PHYSICS & ENGINEERING					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	APPLIED MATHEMATICS			PHYSICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC04					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
CALCULUS I	4MTH111 F	M	16	5		
DISCRETE MATHEMATICS	4AMT111 G	C	16	5		4MTH111
CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	M	16	5		4MTH111
EITHER INTRODUCTORY COMPUTING	4CPS111 B	E	16	5		
OR GENERAL CHEMISTRY 111	4CHM111 E	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
FURTHER DISCRETE MATHEMATICS	4AMT122 G	M	16	6		4MTH112 4AMT111
CALCULUS II	4MTH112 F	C	16	6		4MTH111

ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	M	16	6		
EITHER INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	E	16	6		4CPS111
OR ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM112 G	E	16	6	4CHM111 4CHM112 4MTH111	
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
DYNAMICAL SYSTEMS & MATHEMATICAL MODELLING	4AMT211 E	M	16	6	4AMT122	4MTH221
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112	
MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4PHY211 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
EITHER DATA STRUCTURES AND ALGORITHMS	4CPS211 D	E	16	6	4CPS111	
OR ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM211 G	E	16	6	4CHM111 4CHM112 4MTH111	
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO OPERATIONS RESEARCH	4AMT212 E	M	16	6	4AMT122	4MTH222
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	C	16	6		4MTH221
MODERN PHYSICS, PHOTONICS & WAVES	4PHY212 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
ELECTROMAGNETISM	4PHY222 A	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
<b>THIRD YEAR SEMESTER 1</b>						
TENSOR ANALYSIS	4AMT331 B	M	16	7	4AMT212	
APPLIED MATHEMATICAL METHODS	4AMT321 D	M	16	7	4AMT212	
QUANTUM AND STATISTICAL PHYSICS	4PHY311 H	M	16	7	4PHY212	
ELECTRONIC CIRCUITS AND DEVICES	4PHY321 F	M	16	7	4PHY211 4PHY212 4PHY222	
<b>THIRD YEAR SEMESTER 2</b>						
ADVANCED CLASSICAL MECHANICS	4AMT312 B	M	16	7	4AMT212	

NUMERICAL METHODS	4AMT322 D	M	16	7	4AMT212	
NUCLEAR PHYSICS AND APPLICATIONS	4PHY312 H	M	16	7	4PHY211 4PHY212	
SOLID STATE PHYSICS & MATERIAL SCIENCE	4PHY322 F	M	16	7	4PHY211 4PHY212	

4BSC05 APPLIED MATHEMATICS AND STATISTICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	MATHEMATICAL SCIENCES					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	APPLIED MATHEMATICS			STATISTICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC05					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE OR INFO TECHNOLOGY OR LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
CALCULUS I	4MTH111 F	C	16	5		
DISCRETE MATHEMATICS	4AMT111 G	M	16	5		4MTH111
INTRODUCTORY COMPUTING	4CPS111 B	C	16	5		
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	M	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
FURTHER DISCRETE MATHEMATICS	4AMT122 G	M	16	6		4MTH112 4AMT111
CALCULUS II	4MTH112 F	C	16	6		4MTH111
INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	C	16	6		4CPS111
STATISTICS FOR SCIENCE STUDENTS	4STT112 E	M	16	6		4STT111 4MTH112
COMPUTER LITERACY II	4CPS122 X	C	16	5		

SECOND YEAR SEMESTER 1						
DYNAMICAL SYSTEMS & MATHEMATICAL MODELLING	4AMT211 E	M	16	6	4AMT122	4MTH221
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112	
DATA STRUCTURES AND ALGORITHMS	4CPS211 D	C	16	6	4CPS111	
DISTRIBUTION THEORY	4STT211 C	M	16	6	4STT112	4MTH221
SECOND YEAR SEMESTER 2						
INTRO TO OPERATIONS RESEARCH	4AMT212 E	M	16	6	4AMT122	4MTH222
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	C	16	6		4MTH221
SOFTWARE ENGINEERING	4CPS212 D	C	16	6	4CPS112	4CPS211
STATISTICAL INFERENCE	4STT212 C	M	16	6		4STT211 4MTH221
THIRD YEAR SEMESTER 1						
TENSOR ANALYSIS	4AMT331 B	M	16	7	4AMT212	
APPLIED MATHEMATICAL METHODS	4AMT321 D	M	16	7	4AMT212	
RANDOM PROCESSES	4STT311 F	M	16	7	4STT211 4MTH222	
EXPERIMENTAL DESIGN	4STT321 H	M	16	7	4STT212	
THIRD YEAR SEMESTER 2						
ADVANCED CLASSICAL MECHANICS	4AMT312 B	M	16	7	4AMT212	
NUMERICAL METHODS	4AMT322 D	M	16	7	4AMT212	
LINEAR MODELS	4STT312 F	M	16	7	4STT212	
TIME SERIES	4STT322 H	M	16	7	4STT212	

4BSC06 BIOCHEMISTRY AND BOTANY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BIOCHEMISTRY & MICROBIOLOGY AND BOTANY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
MAJORS	BIOCHEMISTRY			BOTANY		
ABBREVIATION	BSC					
UNIZULU CODE	4BSC06					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	M	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	M	16	6		4BOT111
INTRO TO ZOOLOGY II	4ZOL112 A	C	16	6		4ZOL111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
SECOND YEAR SEMESTER 1						

BIOMOLECULES & ENZYMOLOGY	4BCH211 H	M	16	6	4CHM121 4CHM122	
PROKARYOTES STRUCTURE AND ENVIRONMENTAL MICROBIOLOGY	4MCB221 A	C	16	6	4CHM121 4CHM122	
PLANT GROWTH & DEVELOPMENT	4BOT211 G	M	16	6	4BOT111 4BOT112	
PROKARYOTES CLASSIFICATION & MICROBIAL TECHNIQUES	4MCB211 D	C	16	6	4CHM121 4CHM122	
<b>SECOND YEAR SEMESTER 2</b>						
METABOLISM	4BCH212 H	M	16	6	4CHM121 4CHM122	
BIOCHEMISTRY: PRINCIPLES & TECHNIQUES	4BCH222 A	M	16	6	4CHM121 4CHM122	
PLANT ANATOMY & BIODIVERSITY	4BOT212 G	M	16	6	4BOT111 4BOT112	
MICROBIAL GROWTH & MEDICAL MICROBIOLOGY	4MCB212 D	C	16	6	4CHM121 4CHM122	4MCB211
<b>THIRD YEAR SEMESTER 1</b>						
GENE EXPRESSION AND REPLICATION	4BCH311 A	M	16	7	4BCH212	
METABOLIC REGULATION	4BCH321 C	M	16	7	4BCH212	
CYTOLOGY GENETICS AND PLANT BIOCHEMISTRY	4BOT311 B	M	16	7	4BOT211 4BOT212	
AQUATIC BOTANY AND LOWER PLANT TAXONOMY	4BOT321 D	M	16	7	4BOT211 4BOT212	
<b>THIRD YEAR SEMESTER 2</b>						
RECOMBINANT DNA TECHNOLOGY	4BCH312 A	M	16	7	4BCH211	
BIOCHEMISTRY OF NUTRITION	4BCH322 C	M	16	7	4BCH212 4BCH211	
PEOPLE & PLANTS	4BOT312 B	M	16	7	4BOT211 4BOT212	
PLANT CONSERVATION AND MANAGEMENT & TERRESTRIAL ECOLOGY	4BOT322 D	M	16	7	4BOT211 4BOT212	



4BSC07 BIOCHEMISTRY AND CHEMISTRY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BIOCHEMISTRY & MICROBIOLOGY AND CHEMISTRY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
MAJORS	BIOCHEMISTRY			CHEMISTRY		
ABBREVIATION	BSC					
UNIZULU CODE	4BSC07					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
GENERAL CHEMISTRY 111	4CHM111 E	M	16	5		
CALCULUS I	4MTH111 F	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
GENERAL CHEMISTRY 112	4CHM112 E	M	16	6		4CHM111
CALCULUS II	4MTH112 F	C	16	6		4MTH111
ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS(BIO)	4PHY122 C	C	16	6		
INTRO TO ZOOLOGY II	4ZOL112 A	C	16	6		4ZOL111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
SECOND YEAR SEMESTER 1						

BIOMOLECULES & ENZYMOLOGY	4BCH211 H	M	16	6	4CHM111 4CHM112	
INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	C	16	5		
ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM211 G	M	16	6	4CHM111 4CHM112 4MTH111	
ANIMAL ANATOMY & PHYSIOLOGY	4ZOL211	CC	16	6	4ZOL111 4ZOL112	
<b>SECOND YEAR SEMESTER 2</b>						
METABOLISM	4BCH212 H	M	16	6	4CHM111 4CHM112	
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	C	16	6		4BOT111
ORGANIC & PHYSICAL CHEMISTRY 2	4CHM212 G	M	16	6	4CHM111 4CHM112 4MTH111	
BIOCHEMISTRY: PRINCIPLES & TECHNIQUES	4BCH222 A	M	16	6	4CHM111 4CHM112	
<b>THIRD YEAR SEMESTER 1</b>						
GENE EXPRESSION AND REPLICATION	4BCH311 A	M	16	7	4BCH212	
METABOLIC REGULATION	4BCH321 C	M	16	7	4BCH212	
ORGANIC CHEMISTRY 3	4CHM311 B	M	16	7	4CHM212 4MTH112	
PHYSICAL CHEMISTRY 3	4CHM321 D	M	16	7	4CHM212 4MTH112	
<b>THIRD YEAR SEMESTER 2</b>						
INORGANIC CHEMISTRY 3	4CHM312 B	M	16	7	4CHM211 4MTH112	
ANALYTICAL CHEMISTRY 3	4CHM322 D	M	16	7	4CHM211 4MTH112	
RECOMBINANT DNA TECHNOLOGY	4BCH312 A	M	16	7	4BCH211	
BIOCHEMISTRY OF NUTRITION	4BCH322 C	M	16	7	4BCH212	

4BSC08 BIOCHEMISTRY AND HUMAN MOVEMENT SCIENCE						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BIOCHEMISTRY & MICROBIOLOGY AND BIOKINETICS & SPORT SCIENCE					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	BIOCHEMISTRY		HUMAN MOVEMENT SCIENCE			
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC08					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
HUMAN MOVEMENT SCIENCE 1A	4HMS111 H	M	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
HUMAN MOVEMENT SCIENCE 1B	4HMS112 H	M	16	6		
INTRO TO ZOOLOGY II	4ZOL112 A	C	16	6		4ZOL111

COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
BIOMOLECULES & ENZYMOLGY	4BCH211 H	M	16	6	4CHM121 4CHM122	
PROKARYOTES CLASSIFICATION & MICROBIAL TECHNIQUES	4MCB211 D	C	16	6	4CHM121 4CHM122	
HUMAN MOVEMENT SCIENCE 2A	4HMS211 F	M	16	6	4HMS111 4HMS112	
HUMAN ANATOMY & PHYSIOLOGY I	4ZOL121 B	C	16	5		
<b>SECOND YEAR SEMESTER 2</b>						
METABOLISM	4BCH212 H	M	16	6	4CHM121 4CHM122	
BIOCHEMISTRY: PRINCIPLES & TECHNIQUES	4BCH222 A	M	16	6	4CHM121 4CHM122	
HUMAN MOVEMENT SCIENCE 2B	4HMS212 F	M	16	6	4HMS111 4HMS112	
HUMAN ANATOMY & PHYSIOLOGY II	4ZOL122 B	C	16	6		
<b>THIRD YEAR SEMESTER 1</b>						
GENE EXPRESSION AND REPLICATION	4BCH311 A	M	16	7	4BCH212	
METABOLIC REGULATION	4BCH321 C	M	16	7	4BCH212	
HUMAN MOVEMENT SCIENCE 3A	4HMS311 B	M	16	7	4HMS211 4HMS212	
HUMAN MOVEMENT SCIENCE 3C	4HMS321 D	M	16	7	4HMS211 4HMS212	
<b>THIRD YEAR SEMESTER 2</b>						
RECOMBINANT DNA TECHNOLOGY	4BCH312 A	M	16	7	4BCH211	
BIOCHEMISTRY OF NUTRITION	4BCH322 C	M	16	7	4BCH212 4BCH211	
HUMAN MOVEMENT SCIENCE 3B	4HMS312 B	M	16	7	4HMS211 4HMS212	
HUMAN MOVEMENT SCIENCE 3D	4HMS322 D	M	16	7	4HMS211 4HMS212	

4BSC09 BIOCHEMISTRY AND MICROBIOLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BIOCHEMISTRY & MICROBIOLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
MAJORS	BIOCHEMISTRY			MICROBIOLOGY		
ABBREVIATION	BSC					
UNIZULU CODE	4BSC09					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	C	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	C	16	6		4BOT111
INTRO TO ZOOLOGY II	4ZOL112 A	C	16	6		4ZOL111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
SECOND YEAR SEMESTER 1						

BIOMOLECULES & ENZYMOLOGY	4BCH211 H	M	16	6	4CHM121 4CHM122	
PROKARYOTES CLASSIFICATION & MICROBIAL TECHNIQUES	4MCB211 D	M	16	6	4CHM121 4CHM122	
PROKARYOTES STRUCTURE AND ENVIRONMENTAL MICROBIOLOGY	4MCB221 A	M	16	6	4CHM121 4CHM122	
EITHER PLANT GROWTH & DEVELOPMENT	4BOT211 G	E	16	6	4BOT111 4BOT112	
OR HUMAN ANATOMY & PHYSIOLOGY I	4ZOL121 B	E	16	5		
<b>SECOND YEAR SEMESTER 2</b>						
METABOLISM	4BCH212 H	M	16	6	4CHM121 4CHM122	
BIOCHEMISTRY: PRINCIPLES & TECHNIQUES	4BCH222 A	M	16	6	4CHM121 4CHM122	
MICROBIAL GROWTH & MEDICAL MICROBIOLOGY	4MCB212 D	M	16	6	4CHM121 4CHM122	4MCB211
EITHER PLANT ANATOMY & BIODIVERSITY	4BOT212 G	E	16	6	4BOT111 4BOT112	
OR HUMAN ANATOMY & PHYSIOLOGY II	4ZOL122 B	E	16	6		
<b>THIRD YEAR SEMESTER 1</b>						
GENE EXPRESSION AND REPLICATION	4BCH311 A	M	16	7	4BCH212	
METABOLIC REGULATION	4BCH321 C	M	16	7	4BCH212	
FOOD MICROBIOLOGY	4MCB311 E	M	16	7	4MCB212	
EPIDEMIOLOGY	4MCB321 G	M	16	7	4MCB212	
<b>THIRD YEAR SEMESTER 2</b>						
RECOMBINANT DNA TECHNOLOGY	4BCH312 A	M	16	7	4BCH211	
BIOCHEMISTRY OF NUTRITION	4BCH322 C	M	16	7	4BCH212 4BCH211	
ENVIRONMENTAL INFLUENCES ON MICRO-ORGANISMS & INDUSTRIAL MICROBIOLOGY	4MCB312 E	M	16	7	4MCB212	
BIOTECHNOLOGY	4MCB322 G	M	16	7	4MCB212	

4BSC10 BIOCHEMISTRY AND ZOOLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BIOCHEMISTRY & MICROBIOLOGY AND ZOOLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
MAJORS	BIOCHEMISTRY			ZOOLOGY		
ABBREVIATION	BSC					
UNIZULU CODE	4BSC10					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	C	16	5		
INTRO TO ZOOLOGY I	4ZOL111 AM	M	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	C	16	6		4BOT111
INTRO TO ZOOLOGY II	4ZOL112 AM	M	16	6		4ZOL111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
SECOND YEAR SEMESTER 1						
BIOMOLECULES & ENZYMOLOGY	4BCH211 H	M	16	6	4CHM121 4CHM122	

PROKARYOTES CLASSIFICATION & MICROBIAL TECHNIQUES	4MCB211 D	C	16	6	4CHM121 4CHM122	
ANIMAL ANATOMY & PHYSIOLOGY	4ZOL211 C	M	16	6	4ZOL111 4ZOL112	
EITHER PROKARYOTES & EUKARYOTES	4MCB221 A	E	16	6	4CHM121 4CHM122	
OR PLANT GROWTH & DEVELOPMENT	4BOT211 G	E	16	6	4BOT111 4BOT112	
<b>SECOND YEAR SEMESTER 2</b>						
METABOLISM	4BCH212 H	M	16	6	4CHM121 4CHM122	
MICROBIAL GROWTH & MEDICAL MICROBIOLOGY	4MCB212 D	C	16	6	4CHM121 4CHM122	4MCB211
ANIMAL DIVERSITY	4ZOL212 C	M	16	6	4ZOL111 4ZOL112	
EITHER BIOCHEMISTRY: PRINCIPLES AND TECHNIQUES	4BCH222 A	E	16	6	4CHM121 4CHM122	
OR PLANT ANATOMY & BIODIVERSITY	4BOT212 G	E	16	6	4BOT111 4BOT112	
<b>THIRD YEAR SEMESTER 1</b>						
GENE EXPRESSION AND REPLICATION	4BCH311 A	M	16	7	4BCH212	
METABOLIC REGULATION	4BCH321 C	M	16	7	4BCH212	
ANIMAL ECOLOGY I	4ZOL311 F	M	16	7	4ZOL212	
ECOPHYSIOLOGY & ECOTOXICOLOGY	4ZOL321 H	M	16	7	4ZOL211	
<b>THIRD YEAR SEMESTER 2</b>						
RECOMBINANT DNA TECHNOLOGY	4BCH312 A	M	16	7	4MCB212	
BIOCHEMISTRY OF NUTRITION	4BCH322 C	M	16	7	4BCH211 4BCH212	
ANIMAL ECOLOGY II	4ZOL312 F	M	16	7	4ZOL212	
RESEARCH DESIGN & APPLICATION	4ZOL322 H	M	16	7	4ZOL211	



4BSC11 BOTANY AND GEOGRAPHY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BOTANY AND GEOGRAPHY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
MAJORS	BOTANY			GEOGRAPHY		
ABBREVIATION	BSC					
UNIZULU CODE	4BSC11					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN GEOGRAPHY					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	384					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	M	16	5		
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	M	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	M	16	6		4BOT111
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
HUMAN GEOGRAPHY	4GES112 H	M	16	6		

BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
PLANT GROWTH & DEVELOPMENT	4BOT211 G	M	16	6	4BOT111 4BOT112	
INTRO TO ZOOLOGY I	4ZOL111 A	C	16	5		
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	M	16	6	4GES111	
INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	C	16	6		4GES111
<b>SECOND YEAR SEMESTER 2</b>						
PLANT ANATOMY & BIODIVERSITY	4BOT212 G	M	16	6	4BOT111 4BOT112	
INTRO TO ZOOLOGY II	4ZOL112 A	C	16	6		4ZOL111
GEOGRAPHICAL INFORMATION SYSTEMS	4HYD222 PE/PH	C	16	6		4GES211
EITHER DEMOGRAPHICS, HEALTH & SUSTAINABLE DEVELOPMENT	4GES212 C/D	EM	16	6	4GES112	
OR HYDROMETEOROLOGY	4GES222 B	EM	16	6	4GES111	
<b>THIRD YEAR SEMESTER 1</b>						
CYTOLOGY GENETICS AND PLANT BIOCHEMISTRY	4BOT311 B	M	16	7	4BOT211 4BOT212	
AQUATIC BOTANY AND LOWER PLANT TAXONOMY	4BOT321 D	M	16	7	4BOT211 4BOT212	
EITHER URBAN ENVIRONMENT & RECREATION PLANNING	4GES311 A	EM	16	7	4GES212	
OR ATMOSPHERIC PROCESSES AND POLLUTION	4GES321 E	EM	16	7	4GES222	
EITHER LAND USE AND NATURAL RESOURCE MANAGEMENT	4GES331 C	EM	16	7	4GES211	
OR CLIMATE DYNAMICS & WEATHER VARIABILITY AND PREDICTION	4GES341 G	EM	16	7	4GES222	
<b>THIRD YEAR SEMESTER 2</b>						
PEOPLE & PLANTS	4BOT312 B	M	16	7	4BOT211 4BOT212	
PLANT CONSERVATION AND MANAGEMENT & TERRESTRIAL ECOLOGY	4BOT322 D	M	16	7	4BOT211 4BOT212	
ENVIRONMENTAL MANAGEMENT	4GES312 E	M	16	7	4GES222 4GES212	
ENVIRONMENTAL FIELDWORK AND RESEARCH	4GES322 G	M	16	7	4GES211 4GES222 4GES212	

4BSC12 BOTANY AND HYDROLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BOTANY AND HYDROLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
MAJORS	BOTANY			HYDROLOGY		
ABBREVIATION	BSC					
UNIZULU CODE	4BSC12					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	C	16	5		
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	M	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
INTRO TO GEOLOGY	4HYD112 D	M	16	6		
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	M	16	6		4BOT111
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
COMPUTER LITERACY II	4CPS122 X	C	16	5		
SECOND YEAR SEMESTER 1						

INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	M	16	6	4GES111	
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	C	16	5		
PLANT GROWTH & DEVELOPMENT	4BOT211 G	M	16	6	4BOT111 4BOT112	
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	C	16	6	4GES111	
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO SUBSURFACE HYDROLOGY	4HYD212 F	M	16	6	4HYD112	
PLANT ANATOMY & BIODIVERSITY	4BOT212 G	M	16	6	4BOT111 4BOT112	
HYDROMETEOROLOGY	4GES222 B	C	16	6	4GES111	
GEOGRAPHICAL INFORMATION SYSTEMS	4HYD222 PE/PH	C	16	6		4GES211
<b>THIRD YEAR SEMESTER 1</b>						
SURFACE WATER HYDROLOGY	4HYD311 A	M	16	7	4HYD211 4STT122	
GROUNDWATER HYDROLOGY	4HYD321 C	M	16	7	4HYD212	
CYTOLOGY GENETICS AND PLANT BIOCHEMISTRY	4BOT311 B	M	16	7	4BOT211 4BOT212	
AQUATIC BOTANY AND LOWER PLANT TAXONOMY	4BOT321 D	M	16	7	4BOT211 4BOT212	
<b>THIRD YEAR SEMESTER 2</b>						
HYDROLOGICAL MODELLING	4HYD332 A	M	16	7	4HYD211 4HYD212	
WATER RESOURCES MANAGEMENT	4HYD342 C	M	16	7	4HYD211	
PEOPLE & PLANTS	4BOT312 B	M	16	7	4BOT211 4BOT212	
PLANT CONSERVATION AND MANAGEMENT & TERRESTRIAL ECOLOGY	4BOT322 D	M	16	7	4BOT211 4BOT212	

4BSC13 BOTANY AND MICROBIOLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BOTANY AND BIOCHEMMISTRY & MICROBIOLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
MAJORS	BOTANY			MICROBIOLOGY		
ABBREVIATION	BSC					
UNIZULU CODE	4BSC13					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	M	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	M	16	6		4BOT111
INTRO TO ZOOLOGY II	4ZOL112 A	C	16	6		4ZOL111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
SECOND YEAR SEMESTER 1						
PLANT GROWTH & DEVELOPMENT	4BOT211 G	M	16	6	4BOT111 4BOT112	

BIOMOLECULES & ENZYMOLOGY	4BCH211 H	C	16	6	4CHM121 4CHM122	
PROKARYOTES STRUCTURE AND ENVIRONMENTAL MICROBIOLOGY	4MCB221 A	M	16	6	4CHM121 4CHM122	
PROKARYOTES CLASSIFICATION & MICROBIAL TECHNIQUES	4MCB211 D	M	16	6	4CHM121 4CHM122	
<b>SECOND YEAR SEMESTER 2</b>						
PLANT ANATOMY & BIODIVERSITY	4BOT212 G	M	16	6	4BOT111 4BOT112	
METABOLISM	4BCH212 H	C	16	6	4CHM121 4CHM122	
BIOCHEMISTRY: PRINCIPLES & TECHNIQUES	4BCH222 A	C	16	6	4CHM121 4CHM122	
MICROBIAL GROWTH & MEDICAL MICROBIOLOGY	4MCB212 D	M	16	6	4CHM121 4CHM122	4MCB211
<b>THIRD YEAR SEMESTER 1</b>						
CYTOLOGY GENETICS AND PLANT BIOCHEMISTRY	4BOT311 B	M	16	7	4BOT211 4BOT212	
AQUATIC BOTANY AND LOWER PLANT TAXONOMY	4BOT321 D	M	16	7	4BOT211 4BOT212	
FOOD MICROBIOLOGY	4MCB311 E	M	16	7	4MCB212	
EPIDEMIOLOGY	4MCB321 G	M	16	7	4MCB212	
<b>THIRD YEAR SEMESTER 2</b>						
PEOPLE & PLANTS	4BOT312 B	M	16	7	4BOT211 4BOT212	
PLANT CONSERVATION AND MANAGEMENT & TERRESTRIAL ECOLOGY	4BOT322 D	M	16	7	4BOT211 4BOT212	
ENVIRONMENTAL INFLUENCES ON MICRO-ORGANISMS & INDUSTRIAL MICROBIOLOGY	4MCB312 E	M	16	7	4MCB212	
BIOTECHNOLOGY	4MCB322 G	M	16	7	4MCB212	

4BSC14 BOTANY AND ZOOLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BOTANY AND ZOOLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	BOTANY			ZOOLOGY		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC14					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	M	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	M	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	M	16	6		4BOT111
INTRO TO ZOOLOGY II	4ZOL112 A	M	16	6		4ZOL111
COMPUTER LITERACY II	4CPS122 X	C	16	5		

SECOND YEAR SEMESTER 1						
PLANT GROWTH & DEVELOPMENT	4BOT211 G	M	16	6	4BOT111 4BOT112	
ANIMAL ANATOMY & PHYSIOLOGY	4ZOL211 C	M	16	6	4ZOL111 4ZOL112	
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	C	16	5		
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	C	16	6		4GES11
SECOND YEAR SEMESTER 2						
PLANT ANATOMY & BIODIVERSITY	4BOT212 G	M	16	6	4BOT111 4BOT112	
ANIMAL DIVERSITY	4ZOL212 C	M	16	6	4ZOL111 4ZOL112	
HYDROMETEOROLOGY	4GES222 B	C	16	6	4GES111	
GEOGRAPHICAL INFORMATION SYSTEMS	4HYD222 PE/PH	C	16	6		4GES211
THIRD YEAR SEMESTER 1						
CYTOLOGY GENETICS AND PLANT BIOCHEMISTRY	4BOT311 B	M	16	7	4BOT211 4BOT212	
AQUATIC BOTANY AND LOWER PLANT TAXONOMY	4BOT321 D	M	16	7	4BOT211 4BOT212	
ANIMAL ECOLOGY I	4ZOL311 F	M	16	7	4ZOL212	
ECOPHYSIOLOGY & ECOTOXICOLOGY	4ZOL321 H	M	16	7	4ZOL211	
THIRD YEAR SEMESTER 2						
PEOPLE & PLANTS	4BOT312 B	M	16	7	4BOT211 4BOT212	
PLANT CONSERVATION AND MANAGEMENT & TERRESTRIAL ECOLOGY	4BOT322 D	M	16	7	4BOT211 4BOT212	
ANIMAL ECOLOGY II	4ZOL312 F	M	16	7	4ZOL212	
RESEARCH DESIGN & APPLICATION	4ZOL322 H	M	16	7	4ZOL211	



4BSC15 CHEMISTRY AND COMPUTER SCIENCE						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	CHEMISTRY AND COMPUTER SCIENCE					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	CHEMISTRY		COMPUTER SCIENCE			
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC15					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
GENERAL CHEMISTRY 111	4CHM111E	M	16	5		
CALCULUS I	4MTH111F	C	16	5		
INTRODUCTORY COMPUTING	4CPS111B	M	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111A	C	16	5		4MTH111
COMPUTER LITERACY I	4CPS121X	C	16	5		
FIRST YEAR SEMESTER 2						
GENERAL CHEMISTRY 112	4CHM112E	M	16	6		4CHM111
CALCULUS II	4MTH112F	C	16	6		4MTH111
INTRO TO SYSTEMS PROGRAMMING	4CPS112B	M	16	6		4CPS111
ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112A	C	16	6		

COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM211 G	M	16	6	4CHM111 4CHM112 4MTH111	
COMPUTER COMMUNICATIONS & NETWORKS	4CPS231 A	C	16	6	4CPS111	
DATA STRUCTURES AND ALGORITHMS	4CPS211 D	M	16	6	4CPS111 4CPS112	
EITHER ADVANCED CALCULUS	4MTH221 H	E	16	6	4MTH112	
OR MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4PHY211 C	E	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
<b>SECOND YEAR SEMESTER 2</b>						
ORGANIC & PHYSICAL CHEMISTRY 2	4CHM212 G	M	16	6	4CHM111 4CHM112 4MTH111	
DATABASE INFORMATION MANAGEMENT I	4CPS232 A	C	16	6	4CPS111	
SOFTWARE ENGINEERING	4CPS212 D	M	16	6	4CPS112	
EITHER LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	E	16	6		4MTH221
OR MODERN PHYSICS, PHOTONICS & WAVES	4PHY212 C	E	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
<b>THIRD YEAR SEMESTER 1</b>						
ORGANIC CHEMISTRY 3	4CHM311 B	M	16	7	4CHM212 4MTH112	
PHYSICAL CHEMISTRY 3	4CHM321 D	M	16	7	4CHM212 4MTH112	
ADVANCED PROGRAMMING TECHNIQUES	4CPS311 E	M	16	7	4CPS211 4CPS212	
SYSTEMS PROGRAMMING (OS & COMPILERS)	4CPS321 G	M	16	7	4CPS211 4CPS212	
<b>THIRD YEAR SEMESTER 2</b>						
INORGANIC CHEMISTRY 3	4CHM312 B	M	16	7	4CHM211 4MTH112	
ANALYTICAL CHEMISTRY 3	4CHM322 D	M	16	7	4CHM211 4MTH112	
DISTRIBUTED SYSTEMS DEVELOPMENT	4CPS312 E	M	16	7	4CPS211 4CPS212	
FINAL YEAR PROJECT	4CPS322 G	M	16	7	4CPS211 4CPS212	4CPS311 4CPS321

4BSC16 CHEMISTRY AND HYDROLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	CHEMISTRY AND HYDROLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	CHEMISTRY			HYDROLOGY		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC16					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	C	16	5		
CALCULUS I	4MTH111 F	C	16	5		
GENERAL CHEMISTRY 111	4CHM111 E	M	16	5		
EITHER CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	E	16	5		4MTH111
OR CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
INTRO TO GEOLOGY	4HYD112 D	M	16	6		

CALCULUS II	4MTH112 F	C	16	6		4MTH111
GENERAL CHEMISTRY 112	4CHM112 E	C	16	6		4CHM111
EITHER ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	E	16	6		
OR ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS(BIO)	4PHY122 C	E	16	6		
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	M	16	6	4GES111	
ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM211 G	M	16	6	4CHM111 4CHM112 4MTH111	
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	C	16	5		
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	C	16	6	4GES111	
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO SUBSURFACE HYDROLOGY	4HYD212 F	M	16	6	4HYD112	
ORGANIC & PHYSICAL CHEMISTRY 2	4CHM212 G	M	16	6	4CHM111 4CHM112 4MTH111	
HYDROMETEOROLOGY	4GES222 B	C	16	6	4GES111	
GEOGRAPHICAL INFORMATION SYSTEMS	4HYD222 PE/PH	C	16	6		4GES211
<b>THIRD YEAR SEMESTER 1</b>						
SURFACE WATER HYDROLOGY	4HYD311 A	M	16	7	4HYD211 4STT122	
GROUNDWATER HYDROLOGY	4HYD321 C	M	16	7	4HYD212	
ORGANIC CHEMISTRY 3	4CHM311 B	M	16	7	4CHM212 4MTH112	
PHYSICAL CHEMISTRY 3	4CHM321 D	M	16	7	4CHM212 4MTH112	
<b>THIRD YEAR SEMESTER 2</b>						
HYDROLOGICAL MODELLING	4HYD332 A	M	16	7	4HYD211 4HYD212	
WATER RESOURCES MANAGEMENT	4HYD342 C	M	16	7	4HYD211	
INORGANIC CHEMISTRY 3	4CHM312 B	M	16	7	4CHM211 4MTH112	
ANALYTICAL CHEMISTRY 3	4CHM322 D	M	16	7	4CHM211 4MTH112	

4BSC17 CHEMISTRY AND MATHEMATICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	CHEMISTRY AND MATHEMATICAL SCIENCES					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	CHEMISTRY			MATHEMATICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC17					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
GENERAL CHEMISTRY 111	4CHM111E	M	16	5		
CALCULUS I	4MTH111F	M	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111A	C	16	5		4MTH111
EITHER DISCRETE MATHEMATICS	4AMT111G	E	16	5		4MTH111
OR INTRODUCTORY COMPUTING	4CPS111B	E	16	5		
COMPUTER LITERACY I	4CPS121X	C	16	5		
FIRST YEAR SEMESTER 2						
GENERAL CHEMISTRY 112	4CHM112E	M	16	6		4CHM111
CALCULUS II	4MTH112F	M	16	6		4MTH111

ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	C	16	6		
EITHER FURTHER DISCRETE MATHEMATICS OR INTRO TO SYSTEMS PROGRAMMING	4AMT122 G	E	16	6		4MTH122 4AMT111
	4CPS112 B	E	16	6		4CPS111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM211 G	M	16	6	4CHM111 4CHM112 4MTH111	
MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4PHY211 C	C	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
ADVANCED CALCULUS	4MTH221 H	M	16	6	4MTH112	
EITHER DYNAMICAL SYSTEMS & MATHEMATICAL MODELLING OR DATA STRUCTURES AND ALGORITHMS	4AMT211 E	E	16	6	4AMT122	4MTH221
	4CPS211 D	E	16	6	4CPS111	
<b>SECOND YEAR SEMESTER 2</b>						
ORGANIC & PHYSICAL CHEMISTRY 2	4CHM212 G	M	16	6	4CHM111 4CHM112 4MTH111	
MODERN PHYSICS, PHOTONICS & WAVES	4PHY212 C	C	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	M	16	6		4MTH221
EITHER INTRO TO OPERATIONS RESEARCH OR SOFTWARE ENGINEERING OR ELECTROMAGNETISM	4AMT212 E	E	16	6	4AMT122	4MTH222
	4CPS212 D	E	16	6	4CPS112	4CPS211
	4PHY222 A	E	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
<b>THIRD YEAR SEMESTER 1</b>						
ORGANIC CHEMISTRY 3	4CHM311 B	M	16	7	4CHM212 4MTH112	
PHYSICAL CHEMISTRY 3	4CHM321 D	M	16	7	4CHM212 4MTH111 4MTH112	
ABSTRACT ALGEBRA	4MTH311 A	M	16	7	4MTH222	
REAL ANALYSIS	4MTH321 C	M	16	7	4MTH222	
<b>THIRD YEAR SEMESTER 2</b>						
INORGANIC CHEMISTRY 3	4CHM312 B	M	16	7	4CHM211 4MTH112	

ANALYTICAL CHEMISTRY 3	4CHM322 D	M	16	7	4CHM211 4MTH112	
GRAPH THEORY	4MTH312 A	M	16	7	4MTH222	
COMPLEX ANALYSIS	4MTH322 C	M	16	7	4MTH222	

4BSC18 CHEMISTRY AND PHYSICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	CHEMISTRY AND PHYSICS & ENGINEERING					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	CHEMISTRY			PHYSICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC18					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
GENERAL CHEMISTRY 111	4CHM111 E	M	16	5		
CALCULUS I	4MTH111 F	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	M	16	5		4MTH111
EITHER DISCRETE MATHEMATICS	4AMT111 G	E	16	5		4MTH111
OR INTRODUCTORY COMPUTING	4CPS111 B	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
GENERAL CHEMISTRY 112	4CHM112 E	M	16	6		4CHM111
CALCULUS II	4MTH112 F	C	16	6		4MTH111



ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	M	16	6		
EITHER FURTHER DISCRETE MATHEMATICS OR INTRO TO SYSTEMS PROGRAMMING	4AMT122 G	E	16	6		4MTH112 4AMT111
	4CPS112 B	E	16	6		4CPS111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM211 G	M	16	6	4CHM111 4CHM112 4MTH111	
MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4PHY211 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112	
EITHER DYNAMICAL SYSTEMS & MATHEMATICAL MODELLING OR DATA STRUCTURES AND ALGORITHMS	4AMT211 E	E	16	6	4AMT122	4MTH221
	4CPS211 D	E	16	6	4CPS111	
<b>SECOND YEAR SEMESTER 2</b>						
ORGANIC & PHYSICAL CHEMISTRY 2	4CHM212 G	M	16	6	4CHM111 4CHM112 4MTH111	
MODERN PHYSICS, PHOTONICS & WAVES	4PHY212 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	C	16	6		4MTH221
ELECTROMAGNETISM	4PHY222 A	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
<b>THIRD YEAR SEMESTER 1</b>						
ORGANIC CHEMISTRY 3	4CHM311 B	M	16	7	4CHM212 4MTH112	
PHYSICAL CHEMISTRY 3	4CHM321 D	M	16	7	4CHM212 4MTH112	
QUANTUM AND STATISTICAL PHYSICS	4PHY311 H	M	16	7	4PHY212	
ELECTRONIC CIRCUITS AND DEVICES	4PHY321 F	M	16	7	4PHY211 4PHY212 4PHY222	
<b>THIRD YEAR SEMESTER 2</b>						
INORGANIC CHEMISTRY 3	4CHM312 B	M	16	7	4CHM211 4MTH112	
ANALYTICAL CHEMISTRY 3	4CHM322 D	M	16	7	4CHM211 4MTH112	
NUCLEAR PHYSICS AND APPLICATIONS	4PHY312 H	M	16	7	4PHY211 4PHY212	
SOLID STATE PHYSICS & MATERIAL SCIENCE	4PHY322 F	M	16	7	4PHY211 4PHY212	

4BSC19 CHEMISTRY AND ZOOLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:						
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	CHEMISTRY			ZOOLOGY		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC19					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
GENERAL CHEMISTRY 111	4CHM111 E	M	16	5		
CALCULUS I	4MTH111 F	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	M	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
GENERAL CHEMISTRY 112	4CHM112 E	M	16	6		4CHM111
CALCULUS II	4MTH112 F	C	16	6		4MTH111
ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS(BIO)	4PHY122 C	C	16	6		

INTRO TO ZOOLOGY II	4ZOL112 A	M	16	6		4ZOL111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM211 G	M	16	6	4CHM111 4CHM112 4MTH111	
ANIMAL ANATOMY & PHYSIOLOGY	4ZOL211 C	M	16	6	4ZOL111 4ZOL112	
INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	C	16	5		
EITHER PROKARYOTES CLASSIFICATION & MICROBIAL TECHNIQUES	4MCB211 D	E	16	6	4CHM111 4CHM112	
OR BIOMOLECULES & ENZYMOLOGY	4BCH211 H	E	16	6	4CHM111 4CHM112	
<b>SECOND YEAR SEMESTER 2</b>						
ORGANIC & PHYSICAL CHEMISTRY 2	4CHM212 G	M	16	6	4CHM111 4CHM112 4MTH111	
ANIMAL DIVERSITY	4ZOL212 C	M	16	6	4ZOL111 4ZOL112	
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	C	16	6		4BOT111
EITHER MICROBIAL GROWTH & MEDICAL MICROBIOLOGY	4MCB212 D	E	16	6	4CHM111 4CHM112	4MCB211
OR METABOLISM	4BCH212 H	E	16	6	4CHM111 4CHM112	
<b>THIRD YEAR SEMESTER 1</b>						
ORGANIC CHEMISTRY 3	4CHM311 B	M	16	7	4CHM212 4MTH112	
PHYSICAL CHEMISTRY 3	4CHM321 D	M	16	7	4CHM212 4MTH112	
ANIMAL ECOLOGY I	4ZOL311 F	M	16	7	4ZOL212	
ECOPHYSIOLOGY & ECOTOXICOLOGY	4ZOL321 H	M	16	7	4ZOL211	
<b>THIRD YEAR SEMESTER 2</b>						
INORGANIC CHEMISTRY 3	4CHM312 B	M	16	7	4CHM211 4MTH112	
ANALYTICAL CHEMISTRY 3	4CHM322 D	M	16	7	4CHM211 4MTH112	
ANIMAL ECOLOGY II	4ZOL312 F	M	16	7	4ZOL212	
RESEARCH DESIGN & APPLICATION	4ZOL322 H	M	16	7	4ZOL211	

4BSC20 COMPUTER SCIENCE AND HYDROLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	HYDROLOGY AND COMPUTER SCIENCE					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	COMPUTER SCIENCE			HYDROLOGY		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC20					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	C	16	5		
INTRODUCTORY COMPUTING	4CPS111 B	M	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
CALCULUS I	4MTH111 F	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
INTRO TO GEOLOGY	4HYD112 D	M	16	6		
INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	M	16	6		4CPS111
ELEMENTARY STATISTICS FOR COMMERCE STUDENTS	4STT122 C	C	16	5		

CALCULUS II	4MTH112 F	C	16	6		4MTH111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	M	16	6	4GES111	
DATA STRUCTURES AND ALGORITHMS	4CPS211 D	M	16	6	4CPS111	
COMPUTER COMMUNICATIONS & NETWORKS	4CPS231 A	C	16	6	4CPS111	
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	E	16	6	4GES111	
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO SUBSURFACE HYDROLOGY	4HYD212 F	M	16	6	4HYD112	
SOFTWARE ENGINEERING	4CPS212 D	M	16	6	4CPS112	4CPS211
DATABASE INFORMATION MANAGEMENT I	4CPS232 A	C	16	6	4CPS111	
GEOGRAPHICAL INFORMATION SYSTEMS	4HYD222 PE/PH	E	16	6		4GES211
<b>THIRD YEAR SEMESTER 1</b>						
SURFACE WATER HYDROLOGY	4HYD311 A	M	16	7	4HYD211 4STT122	
GROUNDWATER HYDROLOGY	4HYD321 C	M	16	7	4HYD212	
ADVANCED PROGRAMMING TECHNIQUES	4CPS311 E	M	16	7	4CPS211	4CPS212
SYSTEMS PROGRAMMING (OS & COMPILERS)	4CPS321 G	M	16	7	4CPS211 4CPS212	
<b>THIRD YEAR SEMESTER 2</b>						
HYDROLOGICAL MODELLING	4HYD332 A	M	16	7	4HYD211 4HYD212	
WATER RESOURCES MANAGEMENT	4HYD342 C	M	16	7	4HYD211	
DISTRIBUTED SYSTEMS DEVELOPMENT	4CPS312 E	M	16	7	4CPS211 4CPS212	
FINAL YEAR PROJECT	4CPS322 G	M	16	7	4CPS211 4CPS212	4CPS311 4CPS321

4BSC21 COMPUTER SCIENCE AND MATHEMATICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	COMPUTER SCIENCE AND MATHEMATICAL SCIENCES					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	COMPUTER SCIENCE			MATHEMATICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC21					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE OR INFO TECHNOLOGY					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE	SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)	
FIRST YEAR SEMESTER 1						
DISCRETE MATHEMATICS	4AMT111 G	C	16	5		4MTH111 (SLMH111)
CALCULUS I	4MTH111 F	M	16	5		
INTRODUCTORY COMPUTING	4CPS111 B	M	16	5		
FURTHER DISCRETE MATHEMATICS	4AMT122 G	M	16	6		4MTH112 4AMT111
EITHER CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	E	16	5		4MTH111
OR ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
CALCULUS II	4MTH112 F	M	16	6		4MTH111

INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	M	16	6		4CPS111
EITHER ELECTROMAGNETISM AND NUCLEAR PHYSICS	4PHY112 A	E	16	6		
OR STATISTICS FOR SCIENCE STUDENTS	4STT112 E	E	16	6		4STT111 4MTH112
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
ADVANCED CALCULUS	4MTH221 H	M	16	6	4MTH112 (SLMH112)	
DATA STRUCTURES AND ALGORITHMS	4CPS211 D	M	16	6	4CPS111	4CPS112
EITHER MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4PHY211 C	E	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
DYNAMICAL SYSTEMS & MATHEMATICAL MODELLING	4AMT211 E	E	16	6	4AMT122	4MTH221
OR COMPUTER COMMUNICATIONS & NETWORKS	4CPS231 A	E	16	6	4CPS111	
OR DISTRIBUTION THEORY	4STT211 C	E	16	6	4STT112	4MTH221
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO OPERATIONS RESEARCH	4AMT212 E	C	16	6	4AMT122	4MTH222
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	M	16	6		4MTH221
SOFTWARE ENGINEERING	4CPS212 D	M	16	6	4CPS112	4CPS211
EITHER ELECTROMAGNETISM	4PHY222 A	E	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
OR INTRO TO OPERATIONS RESEARCH	4AMT212 E	E	16	6	4AMT122	4MTH222
OR DATABASE INFORMATION MANAGEMENT I	4CPS232 A	E	16	6	4CPS111	
OR STATISTICAL INFERENCE	4STT212 C	E	16	6		4STT221 4MTH222
<b>THIRD YEAR SEMESTER 1</b>						
ADVANCED PROGRAMMING TECHNIQUES	4CPS311 E	M	16	7	4CPS211	4CPS212
SYSTEMS PROGRAMMING (OS & COMPILERS)	4CPS321 G	M	16	7	4CPS211 4CPS212	
ABSTRACT ALGEBRA	4MTH311 A	M	16	7	4MTH222	
REAL ANALYSIS	4MTH321 C	M	16	7	4MTH222	
<b>THIRD YEAR SEMESTER 2</b>						

DISTRIBUTED SYSTEMS DEVELOPMENT	4CPS312 E	M	16	7	4CPS211 4CPS212	
FINAL YEAR PROJECT	4CPS322 G	M	16	7	4CPS211 4CPS212	4CPS311 4CPS321
GRAPH THEORY	4MTH312 A	M	16	7	4MTH222	
COMPLEX ANALYSIS	4MTH322 C	M	16	7	4MTH222	



4BSC22 COMPUTER SCIENCE AND PHYSICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	COMPUTER SCIENCE AND PHYSICS & ENGINEERING					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	COMPUTER SCIENCE			PHYSICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC22					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRODUCTORY COMPUTING	4CPS111 B	M	16	5		
CALCULUS I	4MTH111 F	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	M	16	5		4MTH111
EITHER DISCRETE MATHEMATICS	4AMT111 G	E	16	5		4MTH111
OR ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	M	16	6		4CPS111
CALCULUS II	4MTH112 F	C	16	6		4MTH111
ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	M	16	6		
EITHER FURTHER DISCRETE MATHEMATICS	4AMT122 G	E	16	6		4MTH112 4AMT111

OR STATISTICS FOR SCIENCE STUDENTS	4STT112 E	E	16	6		4STT111 4MTH112
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
DATA STRUCTURES AND ALGORITHMS	4CPS211 D	M	16	6	4CPS111	
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112	
MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4PHY211 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
COMPUTER COMMUNICATIONS & NETWORKS	4CPS231 A	C	16	6	4CPS111	
<b>SECOND YEAR SEMESTER 2</b>						
SOFTWARE ENGINEERING	4CPS212 D	M	16	6	4CPS112	4CPS211
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	C	16	6		4MTH221
MODERN PHYSICS, PHOTONICS & WAVES	4PHY212 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
ELECTROMAGNETISM	4PHY222 A	C	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
<b>THIRD YEAR SEMESTER 1</b>						
ADVANCED PROGRAMMING TECHNIQUES	4CPS311 E	M	16	7	4CPS211 4CPS212	
SYSTEMS PROGRAMMING (OS & COMPILERS)	4CPS321 G	M	16	7	4CPS211 4CPS212	
QUANTUM AND STATISTICAL PHYSICS	4PHY311 H	M	16	7	4PHY212	
ELECTRONIC CIRCUITS AND DEVICES	4PHY321 F	M	16	7	4PHY211 4PHY212 4PHY222	
<b>THIRD YEAR SEMESTER 2</b>						
DISTRIBUTED SYSTEMS DEVELOPMENT	4CPS312 E	M	16	7	4CPS211 4CPS212	
FINAL YEAR PROJECT	4CPS322 G	M	16	7	4CPS211 4CPS212	4CPS311 4CPS321
NUCLEAR PHYSICS AND APPLICATIONS	4PHY312 H	M	16	7	4PHY211 4PHY212	
SOLID STATE PHYSICS & MATERIAL SCIENCE	4PHY322 F	M	16	7	4PHY211 4PHY212	

4BSC23 COMPUTER SCIENCE AND STATISTICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	COMPUTER SCIENCE AND MATHEMATICAL SCIENCES					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	COMPUTER SCIENCE			STATISTICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC23					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE OR INFO TECHNOLOGY					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRODUCTORY COMPUTING	4CPS111 B	M	16	5		
CALCULUS I	4MTH111 F	C	16	5		
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	M	16	5		
EITHER DISCRETE MATHEMATICS	4AMT111 G	E	16	5		4MTH111
OR CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	E	16	5		4MTH111
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	M	16	6		4CPS111
CALCULUS II	4MTH112 F	C	16	6		4MTH111
STATISTICS FOR SCIENCE STUDENTS	4STT112 E	M	16	6		4STT111 4MTH112

EITHER FURTHER DISCRETE MATHEMATICS	4AMT122 G	E	16	6		4MTH112 4AMT111
OR ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	E	16	6		
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
DATA STRUCTURES AND ALGORITHMS	4CPS211 D	M	16	6	4CPS111 4CPS112	
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112	
DISTRIBUTION THEORY	4STT211 C	M	16	6	4STT111	4MTH221
COMPUTER COMMUNICATIONS & NETWORKS	4CPS231 A	C	16	6	4CPS111	
<b>SECOND YEAR SEMESTER 2</b>						
SOFTWARE ENGINEERING	4CPS212 D	M	16	6	4CPS112	
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	C	16	6		4MTH221
STATISTICAL INFERENCE	4STT212 C	M	16	6		4STT211 4MTH222
DATABASE INFORMATION MANAGEMENT I	4CPS232 A	C	16	6	4CPS111	
<b>THIRD YEAR SEMESTER 1</b>						
ADVANCED PROGRAMMING TECHNIQUES	4CPS311 E	M	16	7	4CPS211 4CPS212	
SYSTEMS PROGRAMMING (OS & COMPILERS)	4CPS321 G	M	16	7	4CPS211 4CPS212	
RANDOM PROCESSES	4STT311 F	M	16	7	4STT211 4MTH222	
EXPERIMENTAL DESIGN	4STT321 H	M	16	7	4STT212	
<b>THIRD YEAR SEMESTER 2</b>						
DISTRIBUTED SYSTEMS DEVELOPMENT	4CPS312 E	M	16	7	4CPS211 4CPS212	
FINAL YEAR PROJECT	4CPS322 G	M	16	7	4CPS211 4CPS212	4CPS311 4CPS321
LINEAR MODELS	4STT312 F	M	16	7	4STT212	
TIME SERIES	4STT322 H	M	16	7	4STT212	

4BSC24 GEOGRAPHY AND HYDROLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	GEOGRAPHY AND HYDROLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	GEOGRAPHY				HYDROLOGY	
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC24					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN GEOGRAPHY					
ADMISSION REQUIREMENTS	A PASS OF AT LEASE 60% (LEVEL 5) IN MATHEMATICS (CALCULUS ELECTIVE) OR AT LEAST 50% (LEVEL 4) IN MATHEMATICS (OTHER ELECTIVES)					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	M	16	5		
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	C	16	5		
EITHER CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
OR CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	E	16	5		4MTH111

EITHER CALCULUS I OR INTRO TO ZOOLOGY I	4MTH111 F	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
<b>FIRST YEAR SEMESTER 2</b>						
INTRO TO GEOLOGY	4HYD112 D	M	16	6		
INTRO TO HUMAN GEOGRAPHY	4GES112 H	M	16	6		
EITHER CALCULUS II OR MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH112 F	E	16	6		4MTH111
EITHER ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS OR INTRO TO ZOOLOGY II	4MTH122 C	E	16	5		
COMPUTER LITERACY II	4PHY112 A	E	16	6		
	4ZOL112 A	E	16	6		4ZOL111
	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	M	16	6	4GES111	
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	M	16	6	4GES111	
EITHER INTRO TO SOIL SCIENCE OR ADVANCED CALCULUS	4AAG211 E	E	16	6		
OR ANIMAL ANATOMY & PHYSIOLOGY	4MTH221 H	E	16	6	4MTH112	
OR MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4ZOL211 C	E	16	6	4ZOL111 4ZOL112	
OR INTRO TO EXTENSION & RURAL DEV	4PHY211 C	E	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
	4AAE211 D	E	16	6		
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO SUBSURFACE HYDROLOGY	4HYD212 F	M	16	6	4HYD112	
HYDROMETEOROLOGY	4GES222 B	M	16	6	4GES111	
EITHER GEOGRAPHICAL INFORMATION SYSTEMS OR LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4HYD222 PE/PH	E	16	6		4GES211
	4MTH222 H	E	16	6		4MTH221

EITHER DEMOGRAPHICS, HEALTH & SUSTAINABLE DEVELOPMENT	4GES212 C/D	E	16	6	4GES112	
OR MODERN PHYSICS, PHOTONICS & WAVES	4PHY212 C	E	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
<b>THIRD YEAR SEMESTER 1</b>						
SURFACE WATER HYDROLOGY	4HYD311 A	M	16	7	4HYD211 4STT122	
GROUNDWATER HYDROLOGY	4HYD321 C	M	16	7	4HYD212	
ATMOSPHERIC PROCESSES & POLLUTION	4GES321 E	M	16	7	4GES222	
CLIMATE DYNAMICS & WEATHER VARIABILITY AND PREDICTION	4GES341 G	M	16	7	4GES222	
<b>THIRD YEAR SEMESTER 2</b>						
HYDROLOGICAL MODELLING	4HYD332 A	M	16	7	4HYD211 4HYD212	
WATER RESOURCES MANAGEMENT	4HYD342 C	M	16	7	4HYD211	
ENVIRONMENTAL MANAGEMENT	4GES312 E	M	16	7	4GES222(4GES212)	
ENVIRONMENTAL FIELDWORK AND RESEARCH	4GES322 G	M	16	7	4GES211 4GES222(4GES212)	

4BSC25 GEOGRAPHY AND PHYSICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	GEOGRAPHY AND PHYSICS & ENGINEERING					
DEGREE(DESIGNATOR )	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	GEOGRAPHY				PHYSICS	
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC25					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN GEOGRAPHY					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	M	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	M	16	5		4MTH111
CALCULUS I	4MTH111 F	C	16	5		
EITHER GENERAL CHEMISTRY 111	4CHM111 E	E	16	5		
OR ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	E	16	5		
OR INTRODUCTORY COMPUTING	4CPS111 B	E	16	5		



COMPUTER LITERACY I	4CPS121 X	C	16	5		
<b>FIRST YEAR SEMESTER 2</b>						
INTRO TO HUMAN GEOGRAPHY	4GES112 H	M	16	6		
ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	M	16	6		
CALCULUS II	4MTH112 F	C	16	6		4MTH111
EITHER GENERAL CHEMISTRY 112	4CHM112 E	E	16	6		4CHM111
OR STATISTICS FOR SCIENCE STUDENTS	4STT112 E	E	16	6		4STT111 4MTH112
OR INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	E	16	6		4CPS111
OR INTRO TO GEOLOGY	4HYD112 D	E	16	6		
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	M	16	6	4GES111	
MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4PHY211 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112	
EITHER ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM211 G	E	16	6	4CHM111 4CHM112 4MTH111	
OR INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	E	16	6		4GES111
<b>SECOND YEAR SEMESTER 2</b>						
EITHER DEMOGRAPHICS, HEALTH & SUSTAINABLE DEVELOPMENT	4GES212 C/D	EM	16	6	4GES112	
OR HYDROMETEOROLOGY	4GES222 B	EM	16	6	4GES111	
MODERN PHYSICS, PHOTONICS & WAVES	4PHY212 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	C	16	6		4MTH221
ELECTROMAGNETISM	4PHY222 A	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
<b>THIRD YEAR SEMESTER 1</b>						
EITHER URBAN ENVIRONMENT & RECREATION PLANNING	4GES311 A	EM	16	7	4GES212	

OR ATMOSPHERIC PROCESSES AND POLLUTION	4GES321 E	EM	16	7	4GES222	
EITHER LAND USE AND NATURAL RESOURCE MANAGEMENT	4GES331 C	EM	16	7	4GES211	
OR CLIMATE DYNAMICS & WEATHER VARIABILITY AND PREDICTION	4GES341 G	EM	16	7	4GES222	
QUANTUM AND STATISTICAL PHYSICS	4PHY311 H	M	16	7	4PHY212	
ELECTRONIC CIRCUITS AND DEVICES	4PHY321 F	M	16	7	4PHY211 4PHY212 4PHY222	
<b>THIRD YEAR SEMESTER 2</b>						
ENVIRONMENTAL MANAGEMENT	4GES312 E	M	16	7	4GES222(4GES212)	
ENVIRONMENTAL FIELDWORK AND RESEARCH	4GES322 G	M	16	7	4GES211 4GES222(4GES212)	
NUCLEAR PHYSICS AND APPLICATIONS	4PHY312 H	M	16	7	4PHY211 4PHY212	
SOLID STATE PHYSICS & MATERIAL SCIENCE	4PHY322 F	M	16	7	4PHY211 4PHY212	

4BSC26 GEOGRAPHY AND STATISTICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	GEOGRAPHY AND MATHEMATICAL SCIENCES					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	GEOGRAPHY			STATISTICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC26					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN GEOGRAPHY					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	M	16	5		
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	M	16	5		
CALCULUS I	4MTH111 F	C	16	5		
EITHER CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	E	16	5		4MTH111
OR CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
INTRO TO HUMAN GEOGRAPHY	4GES112 H	M	16	6		

STATISTICS FOR SCIENCE STUDENTS	4STT112 E	M	16	6		4STT111 4MTH112
CALCULUS II	4MTH112 F	C	16	6		4MTH111
EITHER ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	E	16	6		
OR INTRO TO GEOLOGY	4HYD112 D	E	16	6		
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 B	M	16	6	4GES111	
DISTRIBUTION THEORY	4STT211 C	M	16	6	4STT112	4MTH221
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112	
INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	E	16	6		4GES111
<b>SECOND YEAR SEMESTER 2</b>						
EITHER DEMOGRAPHICS, HEALTH & SUSTAINABLE DEVELOPMENT	4GES212 D	EM	16	6	4GES112	
OR HYDROMETEOROLOGY	4GES222 B	EM	16	6	4GES111	
STATISTICAL INFERENCE	4STT212 C	M	16	6		4STT221 4MTH222
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	C	16	6		4MTH221
EITHER DEMOGRAPHICS, HEALTH & SUSTAINABLE DEVELOPMENT	4GES212 D	E	16	6	4GES112	
OR HYDROMETEOROLOGY	4GES222 B	E	16	6	4GES111	
OR INTRO TO SUBSURFACE HYDROLOGY	4HYD212 F	E	16	6		4HYD112
<b>THIRD YEAR SEMESTER 1</b>						
EITHER URBAN ENVIRONMENT & RECREATION PLANNING	4GES311 A	EM	16	7	4GES212	
OR ATMOSPHERIC PROCESSES AND POLLUTION	4GES321 E	EM	16	7	4GES222	
EITHER LAND USE AND NATURAL RESOURCE MANAGEMENT	4GES331 C	EM	16	7	4GES211	
OR CLIMATE DYNAMICS & WEATHER VARIABILITY AND PREDICTION	4GES341 G	EM	16	7	4GES222	
RANDOM PROCESSES	4STT311 F	M	16	7	4STT211 4MTH222	

EXPERIMENTAL DESIGN	4STT321 H	M	16	7	4STT212	
<b>THIRD YEAR SEMESTER 2</b>						
ENVIRONMENTAL MANAGEMENT	4GES312 E	M	16	7	4GES222 4GES212	
ENVIRONMENTAL FIELDWORK AND RESEARCH	4GES322 G	M	16	7	4GES211 4GES222 4GES212	
LINEAR MODELS	4STT312 F	M	16	7	4STT212	
TIME SERIES	4STT322 H	M	16	7	4STT212	

4BSC27 GEOGRAPHY AND ZOOLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	GEOGRAPHY AND ZOOLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	GEOGRAPHY			ZOOLOGY		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC27					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	M	16	5		
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	M	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
INTRO HUMAN GEOGRAPHY	4GES112 H	M	16	6		
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		

MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
INTRO TO ZOOLOGY II	4ZOL112 A	M	16	6		4ZOL111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	M	16	6	4GES111	
ANIMAL ANATOMY & PHYSIOLOGY	4ZOL211 C	M	16	6	4ZOL111 4ZOL112	
INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	C	16	6		4GES111
INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	C	16	5		
<b>SECOND YEAR SEMESTER 2</b>						
EITHER DEMOGRAPHICS, HEALTH & SUSTAINABLE DEVELOPMENT	4GES212 C/D	EM	16	6	4GES112	
OR HYDROMETEOROLOGY	4GES222 B	EM	16	6	4GES111	
ANIMAL DIVERSITY	4ZOL212 C	M	16	6	4ZOL111 4ZOL112	
GEOGRAPHICAL INFORMATION SYSTEMS	4HYD222 PE/PH	C	16	6		4GES211
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	C	16	6		4BOT111
<b>THIRD YEAR SEMESTER 1</b>						
EITHER URBAN ENVIRONMENT & RECREATION PLANNING	4GES311 A	EM	16	7	4GES212	
OR ATMOSPHERIC PROCESSES AND POLLUTION	4GES321 E	EM	16	7	4GES222	
EITHER LAND USE AND NATURAL RESOURCE MANAGEMENT	4GES331 C	EM	16	7	4GES211	
OR CLIMATE DYNAMICS & WEATHER VARIABILITY AND PREDICTION	4GES341 G	EM	16	7	4GES222	
ANIMAL ECOLOGY I	4ZOL311 F	M	16	7	4ZOL212	
ECOPHYSIOLOGY & ECOTOXICOLOGY	4ZOL321 H	M	16	7	4ZOL211	
<b>THIRD YEAR SEMESTER 2</b>						
ENVIRONMENTAL MANAGEMENT	4GES312 E	M	16	7	4GES222 (4GES212)	
ENVIRONMENTAL FIELDWORK AND RESEARCH	4GES322 G	M	16	7	4GES211 4GES222(4GES212)	
ANIMAL ECOLOGY II	4ZOL312 F	M	16	7	4ZOL212	

RESEARCH DESIGN & APPLICATION	4ZOL322 H	M	16	7	4ZOL211	
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4BSC28 HUMAN MOVEMENT SCIENCE AND PHYSICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BIOKINETICS & SPORT SCIENCE AND PHYSICS & ENGINEERING					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	HUMAN MOVEMENT SCIENCE			PHYSICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC28					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
HUMAN MOVEMENT SCIENCE 1A	4HMS111 H	M	16	5		
INTRODUCTORY COMPUTING	4CPS111 B	C	16	5		
CALCULUS I	4MTH111 F	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	M	16	5		4MTH111
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
HUMAN MOVEMENT SCIENCE 1B	4HMS112 H	M	16	6		
INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	C	16	6		4CPS111
CALCULUS II	4MTH112 F	C	16	6		4MTH111

ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	M	16	6		
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
HUMAN MOVEMENT SCIENCE 2A	4HMS211 F	M	16	6	4HMS111 4HMS112	
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112	
HUMAN ANATOMY & PHYSIOLOGY I	4ZOL121 B	C	16	5		
MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4PHY211 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
<b>SECOND YEAR SEMESTER 2</b>						
HUMAN MOVEMENT SCIENCE 2B	4HMS212 F	M	16	6	4HMS111 4HMS112	
HUMAN ANATOMY & PHYSIOLOGY II	4ZOL122 B	C	16	6		
MODERN PHYSICS, PHOTONICS & WAVES	4PHY212 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
ELECTROMAGNETISM	4PHY222 A	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
<b>THIRD YEAR SEMESTER 1</b>						
HUMAN MOVEMENT SCIENCE 3A	4HMS311 B	M	16	7	4HMS211 4HMS212	
HUMAN MOVEMENT SCIENCE 3C	4HMS321 D	M	16	7	4HMS211 4HMS212	
QUANTUM AND STATISTICAL PHYSICS	4PHY311 H	M	16	7	4PHY212	
ELECTRONIC CIRCUITS AND DEVICES	4PHY321 F	M	16	7	4PHY211 4PHY212 4PHY222	
<b>THIRD YEAR SEMESTER 2</b>						
HUMAN MOVEMENT SCIENCE 3B	4HMS312 B	M	16	7	4HMS211 4HMS212	
HUMAN MOVEMENT SCIENCE 3D	4HMS322 D	M	16	7	4HMS211 4HMS212	
NUCLEAR PHYSICS AND APPLICATIONS	4PHY312 H	M	16	7	4PHY211 4PHY212	
SOLID STATE PHYSICS & MATERIAL SCIENCE	4PHY322 F	M	16	7	4PHY211 4PHY212	

4BSC29 HUMAN MOVEMENT SCIENCE AND ZOOLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BIOKINETICS & SPORT SCIENCE AND ZOOLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	HUMAN MOVEMENT SCIENCE			ZOOLOGY		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC29					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
HUMAN MOVEMENT SCIENCE 1A	4HMS111 H	M	16	5		
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	M	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
HUMAN MOVEMENT SCIENCE 1B	4HMS112 H	M	16	6		
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
INTRO TO ZOOLOGY II	4ZOL112 A	M	16	6		4ZOL111

COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
HUMAN MOVEMENT SCIENCE 2A	4HMS211 F	M	16	6	4HMS111 4HMS112	
ANIMAL ANATOMY & PHYSIOLOGY	4ZOL211 C	M	16	6	4ZOL111 4ZOL112	
HUMAN ANATOMY & PHYSIOLOGY I	4ZOL121 B	C	16	5		
BIOMOLECULES & ENZYMOLGY	4BCH211 H	C	16	6	4CHM121 4CHM122	
<b>SECOND YEAR SEMESTER 2</b>						
HUMAN MOVEMENT SCIENCE 2B	4HMS212 F	M	16	6	4HMS111 4HMS112	
ANIMAL DIVERSITY	4ZOL212 C	M	16	6	4ZOL111 4ZOL112	
HUMAN ANATOMY & PHYSIOLOGY II	4ZOL122 B	C	16	6		
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	C	16	6		
<b>THIRD YEAR SEMESTER 1</b>						
HUMAN MOVEMENT SCIENCE 3A	4HMS311 B	M	16	7	4HMS211 4HMS212	
HUMAN MOVEMENT SCIENCE 3C	4HMS321 D	M	16	7	4HMS211 4HMS212	
ANIMAL ECOLOGY I	4ZOL311 F	M	16	7	4ZOL212	
ECOPHYSIOLOGY & ECOTOXICOLOGY	4ZOL321 H	M	16	7	4ZOL211	
<b>THIRD YEAR SEMESTER 2</b>						
HUMAN MOVEMENT SCIENCE 3B	4HMS312 B	M	16	7	4HMS211 4HMS212	
HUMAN MOVEMENT SCIENCE 3D	4HMS322 D	M	16	7	4HMS211 4HMS212	
ANIMAL ECOLOGY II	4ZOL312 F	M	16	7	4ZOL212	
RESEARCH DESIGN & APPLICATION	4ZOL322 H	M	16	7	4ZOL211	

4BSC30 HYDROLOGY AND MICROBIOLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	HYDROLOGY AND BIOCHEMISTRY & MICROBIOLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	HYDROLOGY			MICROBIOLOGY		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC30					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	C	16	5		
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
EITHER INTRO TO ZOOLOGY I	4ZOL111 A	E	16	5		
OR INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						

INTRO TO GEOLOGY	4HYD112 D	M	16	6		
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
EITHER INTRO TO ZOOLOGY II	4ZOL112 A	E	16	6		4ZOL111
OR PLANT MORPHOLOGY & TAXONOMY	4BOT112 E	E	16	6		4BOT111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	M	16	6	4GES111	
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	C	16	5		
PROKARYOTES CLASSIFICATION & MICROBIAL TECHNIQUES	4MCB211 D	M	16	6	4CHM121 4CHM122	
PROKARYOTES STRUCTURE AND ENVIRONMENTAL MICROBIOLOGY	4MCB221 A	M	16	6	4CHM121 4CHM122	
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO SUBSURFACE HYDROLOGY	4HYD212 F	M	16	6	4HYD112	
MICROBIAL GROWTH & MEDICAL MICROBIOLOGY	4MCB212 D	M	16	6	4CHM121 4CHM122	4MCB211
GEOGRAPHICAL INFORMATION SYSTEMS	4HYD222 PE/PH	C	16	6		
HYDROMETEOROLOGY	4GES222 B	C	16	6	4GES111	
<b>THIRD YEAR SEMESTER 1</b>						
SURFACE WATER HYDROLOGY	4HYD311 A	M	16	7	4HYD211 4STT122	
GROUNDWATER HYDROLOGY	4HYD321 C	M	16	7	4HYD212	
FOOD MICROBIOLOGY	4MCB311 E	M	16	7	4MCB212	
EPIDEMIOLOGY	4MCB321 G	M	16	7	4MCB212	
<b>THIRD YEAR SEMESTER 2</b>						
HYDROLOGICAL MODELLING	4HYD332 A	M	16	7	4HYD211 4HYD212	
WATER RESOURCES MANAGEMENT	4HYD342 C	M	16	7	4HYD211	
ENVIRONMENTAL INFLUENCES ON MICRO- ORGANISMS & INDUSTRIAL MICROBIOLOGY	4MCB312 E	M	16	7	4MCB212	
BIOTECHNOLOGY	4MCB322 G	M	16	7	4MCB212	

4BSC31 HYDROLOGY AND PHYSICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	HYDROLOGY AND PHYSICS & ENGINEERING					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	HYDROLOGY			PHYSICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC31					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	C	16	5		
CALCULUS I	4MTH111 F	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	M	16	5		4MTH111
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
INTRO TO GEOLOGY	4HYD112 D	M	16	6		
CALCULUS II	4MTH112 F	C	16	6		4MTH111
ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	M	16	6		

STATISTICS FOR SCIENCE STUDENTS	4STT112 E	C	16	6		4STT111 4MTH112
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	M	16	6	4GES111	
MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4PHY211 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112 4MTH111	
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	C	16	6	4GES111	
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO SUBSURFACE HYDROLOGY	4HYD212 F	M	16	6	4HYD112	
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	C	16	6		4MTH221
MODERN PHYSICS, PHOTONICS & WAVES	4PHY212 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
ELECTROMAGNETISM	4PHY222 A	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
GEOGRAPHICAL INFORMATION SYSTEMS (OPTIONAL ADDITIONAL MODULE)	4HYD222	E	16	6		4GES211
<b>THIRD YEAR SEMESTER 1</b>						
SURFACE WATER HYDROLOGY	4HYD311 A	M	16	7	4HYD211 4STT122	
GROUNDWATER HYDROLOGY	4HYD321 C	M	16	7	4HYD212	
QUANTUM AND STATISTICAL PHYSICS	4PHY311 H	M	16	7	4PHY212	
ELECTRONIC CIRCUITS AND DEVICES	4PHY321 F	M	16	7	4PHY211 4PHY212 4PHY222	
<b>THIRD YEAR SEMESTER 2</b>						
HYDROLOGICAL MODELLING	4HYD332 A	M	16	7	4HYD211 4HYD212	
WATER RESOURCES MANAGEMENT	4HYD342 C	M	16	7	4HYD211	
NUCLEAR PHYSICS AND APPLICATIONS	4PHY312 H	M	16	7	4PHY211 4PHY212	
SOLID STATE PHYSICS & MATERIAL SCIENCE	4PHY322 F	M	16	7	4PHY211 4PHY212	



4BSC32 HYDROLOGY AND STATISTICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	HYDROLOGY AND MATHEMATICAL SCIENCES					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	HYDROLOGY			STATISTICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC32					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	C	16	5		
CALCULUS I	4MTH111 F	C	16	5		
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	M	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
INTRO TO GEOLOGY	4HYD112 D	M	16	6		
CALCULUS II	4MTH112 F	C	16	6		4MTH111
INTRO HUMAN GEOGRAPHY	4GES112 H	C	16	6		

STATISTICS FOR SCIENCE STUDENTS	4STT112 E	M	16	6		4STT111 4MTH112
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	M	16	6	4GES111	
DISTRIBUTION THEORY	4STT211 C	M	16	6	4STT112	4MTH221
ADVANCED CALCULUS	4MTH221 H	C	16	6	4MTH112	
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	C	16	6	4GES111	
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO SUBSURFACE HYDROLOGY	4HYD212 F	M	16	6	4HYD112	
STATISTICAL INFERENCE	4STT212 C	M	16	6		4STT221 4MTH222
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	C	16	6		4MTH221
GEOGRAPHICAL INFORMATION SYSTEMS	4HYD222 PE/PH	C	16	6		4GES211
<b>THIRD YEAR SEMESTER 1</b>						
SURFACE WATER HYDROLOGY	4HYD311 A	M	16	7	4HYD211 4STT122	
GROUNDWATER HYDROLOGY	4HYD321 C	M	16	7	4HYD212	
RANDOM PROCESSES	4STT311 F	M	16	7	4STT211 4MTH222	
EXPERIMENTAL DESIGN	4STT321 H	M	16	7	4STT212	
<b>THIRD YEAR SEMESTER 2</b>						
HYDROLOGICAL MODELLING	4HYD332 A	M	16	7	4HYD211 4HYD212	
WATER RESOURCES MANAGEMENT	4HYD342 C	M	16	7	4HYD211	
LINEAR MODELS	4STT312 F	M	16	7	4STT212	
TIME SERIES	4STT322 H	M	16	7	4STT212	

4BSC33 HYDROLOGY AND ZOOLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	HYDROLOGY AND ZOOLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	HYDROLOGY			ZOOLOGY		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC33					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
INTRO TO PHYSICAL & ENVIRONMENTAL GEOGRAPHY	4GES111 H	C	16	5		
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	M	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
INTRO TO GEOLOGY	4HYD112 D	M	16	6		
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		

INTRO TO ZOOLOGY II	4ZOL112 A	M	16	6		4ZOL111
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
INTRO TO SURFACE WATER HYDROLOGY	4HYD211 F	M	16	6	4GES111	
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E (4STT122)	C	16	5		
ANIMAL ANATOMY & PHYSIOLOGY	4ZOL211 C	M	16	6	4ZOL111 4ZOL112	
GLOBAL LANDFORMS & CARTOGRAPHY	4GES211 C/D	C	16	6	4GES111	
<b>SECOND YEAR SEMESTER 2</b>						
INTRO TO SUBSURFACE HYDROLOGY	4HYD212 F	M	16	6	4HYD112	
ANIMAL DIVERSITY	4ZOL212 C	M	16	6	4ZOL111 4ZOL112	
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	C	16	6		
GEOGRAPHICAL INFORMATION SYSTEMS	4HYD222 PE/PH	C	16	6		4GES211
<b>THIRD YEAR SEMESTER 1</b>						
SURFACE WATER HYDROLOGY	4HYD311 A	M	16	7	4HYD211 4STT122	
GROUNDWATER HYDROLOGY	4HYD321 C	M	16	7	4HYD212	
ANIMAL ECOLOGY I	4ZOL311 F	M	16	7	4ZOL212	
ECOPHYSIOLOGY & ECOTOXICOLOGY	4ZOL321 H	M	16	7	4ZOL211	
<b>THIRD YEAR SEMESTER 2</b>						
HYDROLOGICAL MODELLING	4HYD332 A	M	16	7	4HYD211 4HYD212	
WATER RESOURCES MANAGEMENT	4HYD342 C	M	16	7	4HYD211	
ANIMAL ECOLOGY II	4ZOL312 F	M	16	7	4ZOL212	
RESEARCH DESIGN & APPLICATION	4ZOL322 H	M	16	7	4ZOL211	

4BSC34 MATHEMATICS AND PHYSICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	MATHEMATICAL SCIENCES AND PHYSICS & ENGINEERING					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	MATHEMATICS			PHYSICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC34					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
CALCULUS I	4MTH111 F	M	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	M	16	5		4MTH111
EITHER DISCRETE MATHEMATICS	4AMT111 G	E	16	5		4MTH111
OR INTRODUCTORY COMPUTING	4CPS111 B	E	16	5		
OR ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	E	16	5		
OR GENERAL CHEMISTRY 111	4CHM111 E	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
CALCULUS II	4MTH112 F	M	16	6		4MTH111
ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	M	16	6		

EITHER INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	E	16	6		4CPS111
OR FURTHER DISCRETE MATHEMATICS	4AMT122 G	E	16	6		4MTH112, 4AMT111
OR STATISTICS FOR SCIENCE STUDENTS	4STT112	E	16	6		4STT111 4MTH112
OR GENERAL CHEMISTRY 112	4CHM112 E	E	16	6		4CHM111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
MECHANICS SPECIAL RELATIVITY & PROPERTIES OF MATTER	4PHY211 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
ADVANCED CALCULUS	4MTH221 H	M	16	6	4MTH112	
EITHER DATA STRUCTURES AND ALGORITHMS	4CPS211 D	E	16	6	4CPS111	
OR DYNAMICAL SYSTEMS & MATHEMATICAL MODELLING	4AMT211 E	E	16	6	4AMT122	4MTH221
OR ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM211 G	E	16	6	4CHM111 4CHM112 4MTH111	
<b>SECOND YEAR SEMESTER 2</b>						
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	M	16	6		4MTH221
MODERN PHYSICS, PHOTONICS & WAVES	4PHY212 C	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
ELECTROMAGNETISM	4PHY222 A	M	16	6	4PHY111 4PHY112 4MTH111 4MTH112	
EITHER INTRO TO OPERATIONS RESEARCH	4AMT212 E	E	16	6	4AMT122	4MTH222
SOFTWARE ENGINEERING	4CPS212 D	E	16	6	4CPS112	4CPS211
OR ORGANIC & PHYSICAL CHEMISTRY 2	4CHM212 G	E	16	6	4CHM111 4CHM112 4MTH111	
<b>THIRD YEAR SEMESTER 1</b>						
ABSTRACT ALGEBRA	4MTH311 A	M	16	7	4MTH222	
REAL ANALYSIS	4MTH321 C	M	16	7	4MTH222	
QUANTUM AND STATISTICAL PHYSICS	4PHY311 H	M	16	7	4PHY212	
ELECTRONIC CIRCUITS AND DEVICES	4PHY321 F	M	16	7	4PHY211 4PHY212 4PHY222	

THIRD YEAR SEMESTER 2						
GRAPH THEORY	4MTH312 A	M	16	7	4MTH222	
COMPLEX ANALYSIS	4MTH322 C	M	16	7	4MTH222	
NUCLEAR PHYSICS AND APPLICATIONS	4PHY312 H	M	16	7	4PHY211 4PHY212	
SOLID STATE PHYSICS & MATERIAL SCIENCE	4PHY322 F	M	16	7	4PHY211 4PHY212	

4BSC35 MATHEMATICS AND STATISTICS						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	MATHEMATICAL SCIENCES					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	MATHEMATICS			STATISTICS		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC35					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 60% (LEVEL 5) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE OR INFO TECHNOLOGY OR LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
CALCULUS I	4MTH111 F	M	16	5		
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	M	16	5		
EITHER DISCRETE MATHEMATICS	4AMT111 G	E	16	5		4MTH111
OR INTRODUCTORY COMPUTING	4CPS111 B	E	16	5		
OR GENERAL CHEMISTRY 111	4CHM111 E	E	16	5		
OR CLASSICAL MECHANICS & PROPERTIES OF MATTER	4PHY111 A	E	16	5		4MTH111
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
CALCULUS II	4MTH112 F	M	16	6		4MTH111



STATISTICS FOR SCIENCE STUDENTS	4STT112 E	M	16	6		4STT111 4MTH112
EITHER FURTHER DISCRETE MATHEMATICS	4AMT122 G	E	16	6		4MTH112 4AMT111
OR INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	E	16	6		4CPS111
OR GENERAL CHEMISTRY 112	4CHM112 E	E	16	6		4CHM111
OR ELECTROMAGNETISM, NUCLEAR & MODERN PHYSICS	4PHY112 A	E	16	6		
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
ADVANCED CALCULUS	4MTH221 H	M	16	6	4MTH112	
DISTRIBUTION THEORY	4STT211 C	M	16	6	4STT112	4MTH221
EITHER DYNAMICAL SYSTEMS & MATHEMATICAL MODELLING	4AMT211 E	E	16	6	4AMT122	4MTH221
OR DATA STRUCTURES AND ALGORITHMS	4CPS211 D	E	16	6	4CPS111	
OR ANALYTICAL & INORGANIC CHEMISTRY 2	4CHM211 G	E	16	6	4CHM111 4CHM112 4MTH111	
<b>SECOND YEAR SEMESTER 2</b>						
LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS	4MTH222 H	M	16	6		4MTH221
STATISTICAL INFERENCE	4STT212 C	M	16	6		4STT211 4MTH222
EITHER INTRO TO OPERATIONS RESEARCH	4AMT212 E	E	16	6	4AMT122	4MTH222
OR SOFTWARE ENGINEERING	4CPS212 D	E	16	6	4CPS112	4CPS211
OR ORGANIC & PHYSICAL CHEMISTRY 2	4CHM212 G	E	16	6	4CHM111 4CHM112 4MTH111	
<b>THIRD YEAR SEMESTER 1</b>						
ABSTRACT ALGEBRA	4MTH311 A	M	16	7	4MTH222	
REAL ANALYSIS	4MTH321 C	M	16	7	4MTH222	
RANDOM PROCESSES	4STT311 F	M	16	7	4STT211 4MTH222	
EXPERIMENTAL DESIGN	4STT321 H	M	16	7	4STT212	
<b>THIRD YEAR SEMESTER 2</b>						
GRAPH THEORY	4MTH312 A	M	16	7	4MTH222	
COMPLEX ANALYSIS	4MTH322 C	M	16	7	4MTH222	
LINEAR MODELS	4STT312 F	M	16	7	4STT212	
TIME SERIES	4STT322 H	M	16	7	4STT212	

4BSC36 MICROBIOLOGY AND ZOOLOGY						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BIOCHEMISTRY & MICROBIOLOGY AND ZOOLOGY					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	MICROBIOLOGY			ZOOLOGY		
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC36					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
INTRODUCTION TO PLANT PHYSIOLOGY & GENETICS	4BOT111 E	C	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	M	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		
PLANT MORPHOLOGY & TEXONOMY	4BOT112 E	C	16	6		4BOT111

INTRO TO ZOOLOGY II	4ZOL112 A	M	16	6		4ZOL111
COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
PROKARYOTES CLASSIFICATION & MICROBIAL TECHNIQUES	4MCB211 D	M	16	6	4CHM121 4CHM122	
ANIMAL ANATOMY & PHYSIOLOGY	4ZOL211 C	M	16	6	4ZOL111 4ZOL112	
PROKARYOTES STRUCTURE AND ENVIRONMENTAL MICROBIOLOGY	4MCB221 A	M	16	6	4CHM121 4CHM122	
EITHER BIOMOLECULES & ENZYMOLOGY	4BCH211 H	E	16	6	4CHM121 4CHM122	
OR PLANT GROWTH & DEVELOPMENT	4BOT211 G	E	16	6	4BOT111 4BOT112	
<b>SECOND YEAR SEMESTER 2</b>						
MICROBIAL GROWTH & MEDICAL MICROBIOLOGY	4MCB212 D	M	16	6	4CHM121 4CHM122	4MCB211
ANIMAL DIVERSITY	4ZOL212 C	M	16	6	4ZOL111 4ZOL112	
METABOLISM	4BCH212 H	C	16	6	4CHM121 4CHM122	
EITHER BIOCHEMISTRY: PRINCIPLES AND TECHNIQUES	4BCH222 A	E	16	6	4CHM121 4CHM122	
OR PLANT ANATOMY & BIODIVERSITY	4BOT212 G	E	16	6	4BOT111 4BOT112	
<b>THIRD YEAR SEMESTER 1</b>						
FOOD MICROBIOLOGY	4MCB311 E	M	16	7	4MCB212	
EPIDEMIOLOGY	4MCB321 G	M	16	7	4MCB212	
ANIMAL ECOLOGY I	4ZOL311 F	M	16	7	4ZOL212	
ECOPHYSIOLOGY & ECOTOXICOLOGY	4ZOL321 H	M	16	7	4ZOL211	
<b>THIRD YEAR SEMESTER 2</b>						
ENVIRONMENTAL INFLUENCES ON MICRO-ORGANISMS & INDUSTRIAL MICROBIOLOGY	4MCB312 E	M	16	7	4MCB212	
BIOTECHNOLOGY	4MCB322 G	M	16	7	4MCB212	
ANIMAL ECOLOGY II	4ZOL312 F	M	16	7	4ZOL212	4ZOL321
RESEARCH DESIGN & APPLICATION	4ZOL322 H	M	16	7	4ZOL211	

4BSC37 MICROBIOLOGY AND HUMAN MOVEMENT SCIENCE						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	BIOCHEMISTRY & MICROBIOLOGY AND BIOKINETICS & SPORT SCIENCE					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	MICROBIOLOGY		HUMAN MOVEMENT SCIENCE			
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC37					
EXIT NQF LEVEL	7					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN PHYSICAL SCIENCE					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 50% (LEVEL 4) IN LIFE SCIENCES					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	3 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	416					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
BASIC CHEMISTRY 121	4CHM121 G	C	16	5		
HUMAN MOVEMENT SCIENCE 1A	4HMS111 H	M	16	5		
INTRO TO ZOOLOGY I	4ZOL111 A	C	16	5		
CLASSICAL MECHANICS & PROPERTIES OF MATTER(BIO)	4PHY121 C	C	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
FIRST YEAR SEMESTER 2						
BASIC CHEMISTRY 122	4CHM122 G	C	16	6		
HUMAN MOVEMENT SCIENCE 1B	4HMS112 H	M	16	6		
INTRO TO ZOOLOGY II	4ZOL112 A	C	16	6		4ZOL111
MATHS & STATS FOR EARTH & LIFE SCIENCES	4MTH122 C	C	16	5		

COMPUTER LITERACY II	4CPS122 X	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
PROCARYOTES CLASSIFICATION & MICROBIAL TECHNIQUES	4MCB211 D	M	16	6	4CHM121 4CHM122	
HUMAN MOVEMENT SCIENCE 2A	4HMS211 F	M	16	6	4HMS111 4HMS112	
HUMAN ANATOMY & PHYSIOLOGY I	4ZOL121 B	C	16	5		
BIOMOLECULES & ENZYMOLGY	4BCH211 H	C	16	6	4CHM121 4CHM122	
<b>SECOND YEAR SEMESTER 2</b>						
MICROBIAL GROWTH & MEDICAL MICROBIOLOGY	4MCB212 D	M	16	6	4CHM121 4CHM122	4MCB211
HUMAN MOVEMENT SCIENCE 2B	4HMS212 F	M	16	6	4HMS111 4HMS112	
HUMAN ANATOMY & PHYSIOLOGY II	4ZOL122 B	C	16	6		
METABOLISM	4BCH212 H	C	16	6	4CHM121 4CHM122	
<b>THIRD YEAR SEMESTER 1</b>						
FOOD MICROBIOLOGY	4MCB311 E	M	16	7	4MCB212	
EPIDEMIOLOGY	4MCB321 G	M	16	7	4MCB212	
HUMAN MOVEMENT SCIENCE 3A	4HMS311 B	M	16	7	4HMS211 4HMS212	
HUMAN MOVEMENT SCIENCE 3C	4HMS321 D	M	16	7	4HMS211 4HMS212	
<b>THIRD YEAR SEMESTER 2</b>						
ENVIRONMENTAL INFLUENCES ON MICRO- ORGANISMS & INDUSTRIAL MICROBIOLOGY	4MCB312 E	M	16	7	4MCB212	
BIOTECHNOLOGY	4MCB322 G	M	16	7	4MCB212	
HUMAN MOVEMENT SCIENCE 3B	4HMS312 B	M	16	7	4HMS211 4HMS212	
HUMAN MOVEMENT SCIENCE 3D	4HMS322 D	M	16	7	4HMS211 4HMS212	

The following tables give the programmes of study for focussed programmes offered by the Faculty.

**(a) Agriculture Department**

ANIMAL SCIENCE		4BSC50			
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE				
DEPARTMENT:	AGRICULTURE				
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE				
QUALIFIER	(AGRICULTURE)				
MAJORS	ANIMAL SCIENCE				
ABBREVIATION	BSC (AGRICULTURE)				
QUALIFICATION CODE (SAQF)					
UNIZULU CODE	4BSC50				
EXIT NQF LEVEL	8				
ADMISSION REQUIREMENTS	ENGLISH 4 (50%)				
ADMISSION REQUIREMENTS	MATHEMATICS 4 (50%)				
ADMISSION REQUIREMENTS	AGRICULTURAL SCIENCE OR LIFE SCIENCE 4 (50%)				
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT AND WITH 28 NSC POINTS				
MINIMUM DURATION OF STUDIES	4 YEARS				
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES				
INTAKE FOR THE QUALIFICATION:	JANUARY				
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY				
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES				
TOTAL CREDITS TO GRADUATE:	544				
SUBJECT NAME	SUBJECT CODE	SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1					
BASIC CHEMISTRY 121	4CHM121	16	5		
CLASSICAL MECHANICS BIO	4PHY121	16	5		
CYTOLOGY, GENETICS AND PHYSIOLOGY	4BOT111	16	5		
INTRODUCTION TO ZOOLOGY I	4ZOL111	16	5		
COMPUTER LITERACY I	4CPS121 X	16	5		

FIRST YEAR SEMESTER 2					
BASIC CHEMISTRY	4CHM122	16	6		4CHM121
MATHS AND STATS FOR EARTH AND LIFE SCIENCE	4MTH122	16	5		
PLANT MORPHOLOGY & TEXONOMY	4BOT112	16	6		
INTRODUCTION TO ZOOLOGY II	4ZOL112	16	6		4ZOL111
COMPUTER LITERACY II	4CPS122 X	16	5		
<b>TOTAL</b>		<b>160</b>			
SEMESTER 1 SECOND YEAR					
INTRODUCTION TO ANIMAL SCIENCE	4AAS211	16	6		4ZOL111
INTRODUCTION TO EXTENSION AND RURAL DEVELOPMENT	4AAE211	16	6		
INTRODUCTION TO SOIL SCIENCE	4AAG211	16	6		
BIOMOLECULES AND ENZYMOLOGY	4BCH211	16	6	4CHM121, 4CHM122	
SEMESTER 2 SECOND YEAR					
PRINCIPLES OF ANIMAL PRODUCTION	4AAS212	16	6		4ZOL112
INTRODUCTION TO AGRICULTURAL ECONOMICS & FARM MANAGEMENT	4AAE212	16	6		
INTRODUCTION TO CROP PRODUCTION	4AAG212	16	6	4BOT111, 4BOT112	
METABOLISM	4BCH212	16	6	4CHM121, 4CHM122	
<b>TOTAL</b>		<b>128</b>			
THIRD YEAR SEMESTER 1					
FARM ANIMAL ANATOMY AND PHYSIOLOGY	4AAS311	16	7		4ZOL112 4AAS212
ANIMAL BREEDING	4AAS321	16	7	4AAS211, 4AAS212	
ANIMAL NUTRITION	4AAS331	16	7	4AAS211, 4AAS212	
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111	16	5		
THIRD YEAR SEMESTER 2					
DIGESTIVE PHYSIOLOGY	4AAS312	16	7		4AAS211, 4AAS212
ANIMAL HEALTH	4AAS322	16	7	4AAS211, 4AAS212	
PIG AND POULTRY PRODUCTION	4AAS332	16	7		4AAS211, 4AAS212
PRINCIPLES OF PRODUCTION ECONOMICS	4AAE322	16	7	4AAS211, 4AAG212, 4AAE211	
<b>TOTAL</b>		<b>128</b>			

<b>FOURTH YEAR SEMESTER 1</b>					
PASTURE ECOLOGY	4AAS411	16	8	4AAS211, 4AAS212	
ANIMAL REPRODUCTION	4AAS421	16	8	4AAS322	4AAS311
APPLIED ANIMAL NUTRITION	4AAS431	16	8	4AAS331, 4AAS312	
ANIMAL SCIENCE RESEARCH I	4AAS441	16	8	4AAS211, 4AAS212,	4AAS331, 4AAS332 4STT111
<b>FOURTH YEAR SEMESTER 2</b>					
APPLIED PIG AND POULTRY PRODUCTION	4AAS412	16	8	4AAS332	
APPLIED RUMINANT PRODUCTION	4AAS422	16	8	4AAS211, 4AAS212	
APPLIED ANIMAL SCIENCE	4AAS432	16	8	4AAS211, 4AAS212	
ANIMAL SCIENCE RESEARCH II	4AAS442	16	8	4AAS211, 4AAS212, 4STT111	4AAS331 4AAS322, 4AAS332
<b>TOTAL</b>		<b>128</b>			



**AGRICULTURE AGRIBUSINESS****4BSC51**

<b>FACULTY</b>	FACULTY OF SCIENCE AND AGRICULTURE				
<b>DEPARTMENT:</b>	AGRICULTURE				
<b>DEGREE(DESIGNATOR )</b>	BACHELOR OF SCIENCE				
<b>QUALIFIER</b>	AGRICULTURE				
<b>MAJORS</b>	AGRICULTURAL BUSINESS & MANAGEMENT				
<b>ABBREVIATION</b>	BSC (AGRICULTURE)				
<b>QUALIFICATION CODE (SAQF)</b>					
<b>UNIZULU CODE</b>	4BSC51				
<b>EXIT NQF LEVEL</b>	8				
<b>ADMISSION REQUIREMENTS</b>	ENGLISH 4 (50%)				
<b>ADMISSION REQUIREMENTS</b>	MATHEMATICS 4 (50%)				
<b>ADMISSION REQUIREMENTS</b>	AGRICULTURAL SCIENCE OR LIFE SCIENCE 4 (50%)				
<b>MINIMUM CREDITS FOR ADMISSION</b>	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT AND WITH 28 NSC POINTS				
<b>MINIMUM DURATION OF STUDIES</b>	4 YEARS				
<b>PRESENTATION MODE OF SUBJECTS:</b>	DAY CLASSES				
<b>INTAKE FOR THE QUALIFICATION:</b>	JANUARY				
<b>REGISTRATION CYCLE FOR THE SUBJECTS:</b>	JANUARY				
<b>READMISSION:</b>	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES				
<b>TOTAL CREDITS TO GRADUATE:</b>	544				
<b>SUBJECT NAME</b>	<b>SUBJECT CODE</b>	<b>SUBJECT CREDITS</b>	<b>NQF LEVEL</b>	<b>PREREQUISITE SUBJECT(S)</b>	<b>CO-REQUISITE SUBJECT(S)</b>
<b>FIRST YEAR SEMESTER 1</b>					
BASIC CHEMISTRY 121	4CHM121	16	5		
CLASSICAL MECHANICS BIO	4PHY121	16	5		
CYTOLOGY, GENETICS AND PHYSIOLOGY	4BOT111	16	5		
INTRODUCTION TO ZOOLOGY I	4ZOL111	16	5		
COMPUTER LITERACY I	4CPS121 X	16	5		
<b>FIRST YEAR SEMESTER 2</b>					
BASIC CHEMISTRY	4CHM122	16	6		4CHM121
MATHS AND STATS FOR EARTH AND LIFE SCIENCE	4MTH122	16	5		
PLANT MORPHOLOGY & TEXONOMY	4BOT112	16	6		
INTRODUCTION TO ZOOLOGY II	4ZOL112	16	6		4ZOL111

COMPUTER LITERACY II	4CPS122 X	16	5		
<b>TOTAL</b>		<b>160</b>			
SUBJECT NAME	SUBJECT CODE	SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
<b>SECOND YEAR SEMESTER 1</b>					
INTRODUCTION TO ANIMAL SCIENCE	4AAS211	16	6		4ZOL111
INTRODUCTION TO EXTENSION AND RURAL DEVELOPMENT	4AAE211	16	6		
INTRODUCTION TO SOIL SCIENCE	4AAG211	16	6		
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111	16	5		
<b>SECOND YEAR SEMESTER 2</b>					
PRINCIPLES OF ANIMAL PRODUCTION	4AAS212	16	6		4ZOL112
INTRODUCTION TO AGRICULTURAL ECONOMICS & FARM MANAGEMENT	4AAE212	16	6		
INTRODUCTION TO CROP PRODUCTION	4AAG212	16	6		
EXTENSION METHODS	4AAE222	16	6		
<b>TOTAL</b>		<b>128</b>			
<b>THIRD YEAR SEMESTER 1</b>					
FARM MANAGEMENT AND RECORD KEEPING SYSTEMS	4AAE311	16	7	4AAE212	
LAND USE AND NATURAL RESOURCES MANAGEMENT	4GES331	16	7		
INTERMEDIATE MICROECONOMICS	2ECN201	16	6		
FINANCIAL MANAGEMENT	2BMG201	16	6		
<b>THIRD YEAR SEMESTER 2</b>					
ENTREPRENEURSHIP, CO-OPS AND OTHER FORMS OF BUSINESS	4AAE312	16	7		
PRINCIPLES OF PRODUCTION ECONOMICS	4AAE322	16	7	4AAS211, 4AAG212, 4AAE212	
PRINCIPLES MACROECONOMICS	2ECN102	16	6		
FINANTIAL MANAGEMENT	2BMG202	16	6		
<b>TOTAL</b>		<b>128</b>			
<b>FOURTH YEAR SEMESTER 1</b>					

AGRIBUSINESS MANAGEMENT AND MARKETING	4AAE411	16	8	4AAE212	4AAE312
RISK MANAGEMENT	4AAE421	16	8		4AAE311 4AAE312
FINANCIAL MANAGEMENT	2BMG301	16	7		
AGRIBUSINESS RESEARCH PROJECT I	4AAE441	16	8	4AAE211, 4AAE212, 4AAE222, 4STT111	4AAE311, 4AAE312, 4AAE322
<b>FOURTH YEAR SEMESTER 2</b>					
FARM PLANNING	4AAE412	16	8	4AAS211 4AAE212 4AAG212, 4AAS212	4AAE311 4GES331
AGRICULTURAL POLICY AND INTERNATIONAL TRADE	4AAE422	16	8		2ECN201, 2ECN102
ENVIRONMENTAL MANAGEMENT	4GES312	16	7		
AGRIBUSINESS RESEARCH PROJECT II	4AAE442	16	8	4AAE211, 4AAE212, 4AAE222, 4STT111	4AAE311, 4AAE312, 4AAE322, 4AAE441
<b>TOTAL</b>		<b>128</b>			

**AGRICULTURE AGRONOMY****4BSC52**

<b>FACULTY</b>	FACULTY OF SCIENCE AND AGRICULTURE				
<b>DEPARTMENT:</b>	AGRICULTURE				
<b>DEGREE(DESIGNATOR)</b>	BACHELOR OF SCIENCE				
<b>QUALIFIER</b>	AGRICULTURE				
<b>MAJORS</b>	PLANT SCIENCE				
<b>ABBREVIATION</b>	BSC (AGRICULTURE)				
<b>QUALIFICATION CODE (SAQF)</b>					
<b>UNIZULU CODE</b>	<b>4BSC52</b>				
<b>EXIT NQF LEVEL</b>	8				
<b>ADMISSION REQUIREMENTS</b>	ENGLISH 4 (50%)				
<b>ADMISSION REQUIREMENTS</b>	MATHEMATICS 4 (50%)				
<b>ADMISSION REQUIREMENTS</b>	AGRICULTURAL SCIENCE OR LIFE SCIENCE 4 (50%)				
<b>MINIMUM CREDITS FOR ADMISSION</b>	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT AND WITH 28 NSC POINTS				
<b>MINIMUM DURATION OF STUDIES</b>	4 YEARS				
<b>PRESENTATION MODE OF SUBJECTS:</b>	DAY CLASSES				
<b>INTAKE FOR THE QUALIFICATION:</b>	JANUARY				
<b>REGISTRATION CYCLE FOR THE SUBJECTS:</b>	JANUARY				
<b>READMISSION:</b>	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES				
<b>TOTAL CREDITS TO GRADUATE:</b>	544				
<b>SUBJECT NAME</b>	<b>SUBJECT CODE</b>	<b>SUBJECT CREDITS</b>	<b>NQF LEVEL</b>	<b>PREREQUISITE SUBJECT(S)</b>	<b>CO-REQUISITE SUBJECT(S)</b>
<b>FIRST YEAR SEMESTER 1</b>					
BASIC CHEMISTRY	4CHM121	16	5		
CLASSICAL MECHANICS AND PROPERTIES OF MATTER	4PHY121	16	5		
CYTOLOGY, GENETICS AND PHYSIOLOGY	4BOT111	16	5		
INTRODUCTION TO ZOOLOGY I	4ZOL111	16	5		
COMPUTER LITERACY I	4CPS121 X	16	5		

FIRST YEAR SEMESTER 2					
BASIC CHEMISTRY	4CHM122	16	6		
MATHEMATICS & STATISTICS FOR LIFE AND EARTH SCIENCE	4MTH122	16	5		
PLANT MORPHOLOGY & TEXONOMY	4BOT112	16	6		4BOT111
INTRODUCTION TO ZOOLOGY II	4ZOL112	16	6		
COMPUTER LITERACY II	4CPS122 X	16	6		
<b>TOTAL</b>		<b>160</b>			
SECOND YEAR SEMESTER 1					
INTRODUCTION TO EXTENSION AND RURAL DEVELOPMENT	4AAE211	16	6		
INTRODUCTION TO SOIL SCIENCE	4AAG211	16	6		
PLANT GROWTH & DEVELOPEMNT, FLORAL PROPERTIES	4BOT211	16	6	4BOT111, 4BOT112	
AGRICULTURAL MECHANIZATION AND FARM STRUCTURE	4AAG221	16	6		
SECOND YEAR SEMESTER 2					
INTRODUCTION TO AGRICULTURAL ECONOMICS & FARM MANAGEMENT	4AAE212	16	6		
INTRODUCTION TO CROP PRODUCTION	4AAG212	16	6	4BOT111, 4BOT112	
PLANT ANATOMY, TAXONOMY & BIODIVERSITY	4BOT212	16	6	4BOT111, 4BOT112	
INTRODUCTION TO SOIL PHYSICS AND CONSERVATION	4AAG222	16	6		4AAG211
<b>TOTAL</b>		<b>128</b>			
THIRD YEAR SEMESTER 1					
CROP PROTECTION 3A	4AAG321	16	7	4AAG212	
PLANT PROPAGATION	4AAG311	16	7	4BOT211, 4BOT212, 4AAG212	

CYTOLOGY, GENETICS & PLANT BIOCHEMISTRY	4BOT311	16	7	4BOT211, 4BOT212,	
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111	16	5		
<b>THIRD YEAR SEMESTER 2</b>					
ENTERP, CO-OPS, &OTHER FORMS OF BUSINESS	4AAE312	16	7		
PLANT BREEDING	4AAG312	16	7	4BOT211, 4BOT212	4BOT311
CROP PROTECTION 3B	4AAG352	16	7		4AAG321
PRINCIPLES OF PRODUCTION ECONOMICS	4AAE322	16	7	4AAG212, 4AAE211	
<b>TOTAL</b>		<b>128</b>			
<b>SEMESTER 1 FOURTH YEAR</b>					
SOIL FERTILITY MANAGEMENT & CONSERVATION	4AAG411	16	8	4AAG211, 4AAG212	
FLORICULTURE AND VEGETABLE CROP PRODUCTION	4AAG451	16	8	4AAG212, 4AAG311	
SEED SCIENCE AND TECHNOLOGY	4AAG431	16	8	4AAG312, 4AAG311	
AGRONOMY RESEARCH PROJECT I	4AAG441	16	8	4AAG211, 4AAG212, 4AAG221 4AAG222	4AAG311, 4AAG312, 4AAG352 4AAG321 4STT111
<b>SEMESTER 1 SEMESTER 2</b>					
FRUIT PRODUCTION	4AAG452	16	8	4AAG212 4AAG311	
APPLIED PLANT BREEDING	4AAG422	16	8	4AAG311, 4AAG312	
FIELD CROP PRODUCTION	4AAG432	16	8	4AAG212 4AAG311	4AAG411
AGRONOMY RESEARCH PROJECT II	4AAG442	16	8	4AAG211, 4AAG212, 4AAG221 4AAG222	4AAG311, 4AAG312, 4AAG321 4AAG352 4AAG441 4STT111
<b>TOTAL</b>		<b>128</b>			

**BACHELOR OF CONSUMER SCIENCE (EXTENSION AND RURAL DEVELOPMENT) 4BSC55**

<b>FACULTY</b>		FACULTY OF SCIENCE AND AGRICULTURE			
<b>DEPARTMENTS:</b>		CONSUMER SCIENCES			
<b>DEGREE(DESIGNATOR)</b>		BACHELOR OF CONSUMER SCIENCE (EXTENSION AND RURAL DEVELOPMENT)			
<b>QUALIFIER</b>		EXTENSION & RURAL DEVELOPMENT			
<b>ABBREVIATION</b>		B CONS SC			
<b>QUALIFICATION CODE (SAQF)</b>					
<b>UNIZULU CODE</b>		4BSC55			
<b>EXIT NQF LEVEL</b>		7			
<b>ADMISSION REQUIREMENTS</b>		NSC WITH DEGREE ENDORSEMENT			
<b>ADMISSION REQUIREMENTS</b>		MINIMUM OF 28 POINTS			
<b>ADMISSION REQUIREMENTS</b>		ENGLISH 4 POINTS AND LIFE SCIENCES 4 POINTS			
<b>MINIMUM CREDITS FOR ADMISSION</b>		NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT AND WITH 28 NSC POINTS			
<b>MINIMUM DURATION OF STUDIES</b>		4 YEARS			
<b>PRESENTATION MODE OF SUBJECTS:</b>		DAY CLASSES			
<b>INTAKE FOR THE QUALIFICATION:</b>		JANUARY			
<b>REGISTRATION CYCLE FOR THE SUBJECTS:</b>		JANUARY			
<b>READMISSION:</b>		SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES			
<b>TOTAL CREDITS TO GRADUATE:</b>		554			
<b>SUBJECT NAME</b>	<b>SUBJECT CODE</b>	<b>SUBJECT CREDITS</b>	<b>NQF LEVEL</b>	<b>PREREQUISITE SUBJECT(S)</b>	<b>CO-REQUISITE SUBJECT(S)</b>
<b>FIRST YEAR SEMESTER 1</b>					
PRACTICAL ENGLISH 1A	1ENG121	16	5		
HUMAN ANATOMY AND PHYSIOLOGY	4ZOL121	16	5		
PHYSICS FOR CONSUMER SCIENCES	4PHY131	8	5		
INTRODUCTION TO HOUSEHOLD & CONSUMER STUDIES	4CNS111	15	5		
COMPUTER LITERACY I	4CPS121X	C	16	5	
<b>FIRST YEAR SEMESTER 2</b>					
FOOD SAFETY & HYGIENE	4CFH112	15	6		
HUMAN ANATOMY AND PHYSIOLOGY	4ZOL122	16	6		
CHEMISTRY FOR CONSUMER SCIENCE	4CHM132	8	6		
INTRODUCTION TO FOOD SCIENCE	4CFS112	15	6		4CFH112

INTRODUCTION TO HUMAN NUTRITION	4CNU112	15	6		
COMPUTER LITERACY II	4CPS122X	C	16	5	
<b>YEAR LONG FOR FIRST YEAR</b>					
UNIZULU 101	UZUL100	16	5		
<b>TOTAL</b>		<b>140</b>			
<b>SECOND YEAR SEMESTER 1</b>					
INTRODUCTION TO EXTENSION & RURAL DEVELOPMENT	4AAE211	15	6		
HOUSEHOLD RESOURCE MANAGEMENT	4CNS211	15	6	4CNS111	
NGO SECTOR, DEVELOPMENT & UNDERDEVELOPMENT	1DEV111	16	5		
MEAL PLANNING & MANAGEMENT	4CFD211	15	6	4CFS112, 4CFH112	
NUTRITION IN THE LIFECYCLE	4CNU211	15	6	4CNU112	
<b>SECOND YEAR SEMESTER 2</b>					
EXTENSION METHODS	4AAE222	16	6		
CONSUMER & THE MARKET	4CNS212	15	6		
COMMUNITY PROJECT DEVELOPMENT & FACILITATION	1DEV112	16	6		
INTRODUCTION TO AGRICULTURAL ECONOMICS & FARM MANAGEMENT	4AAE212 OR 4CHC212	15 16	6	NONE NONE	NONE NONE
PRINCIPLES OF DESIGN & INTERIORS					
<b>TOTAL</b>		<b>138</b>			
<b>SEMESTER 1 THIRD YEAR</b>					
COMMUNITY NUTRITION & FOOD SECURITY	4CNU311	15	7	4CNU112	
FOOD PROCESSING TECHNOLOGIES	4CFS211	15	6	4CFS112 4CFH112	
DEVELOPMENT CONCEPTS: ECONOMIC & SOCIAL	1DEV211	16	6		
NUTRITION EDUCATION & TRAINING	4CNU331	15	7	4CNU211	
<b>THIRD YEAR SEMESTER 2</b>					
GENDER, DEVELOPMENT & TECHNOLOGY	4CNS312	15	7	4CNS211	



FOOD MARKETING	4CFD312	15	7	4CFS112, 4CNU112, 4CNS212	
INTEGRATED RURAL DEVELOPMENT	1DEV222	16	6		
QUANTITY FOOD PRODUCTION OR CLOTHING & TEXTILE 1	4CFD212 OR 4CTC212	15	6	4CFS112 & 4CFH112 NONE	4CFD211 NONE
<b>TOTAL</b>		<b>122</b>			
<b>FOURTH YEAR SEMESTER 1</b>					
RESEARCH METHODS IN CONSUMER SCIENCE	4CRM31 1	15	7		
FOOD PRODUCT DEVELOPMENT	4CFS311	15	7	4CFS211, 4CNS212	
INTEGRATED URBAN DEVELOPMENT	1DEV311	16	7		
INTERNSHIP FOR EXTENSION & RURAL DEVELOPMENT	4CIN419	15	8		1DEV211 1DEV222, 4AAE211
<b>FOURTH YEAR SEMESTER 2</b>					
RESEARCH PROJECT & ORAL/ SEMINAR	4CRM42 2	15	8		
MANAGEMENT OF COMMUNITY PROGRAMS	4CNS41 2	15	8	4CNS211	
PROJECT MANAGEMENT & EVALUATION	1DEV312	16	7		
CLOTHING & TEXTILE 2	4CTC312 OR 4AAE312	15 16	7	4CTC212	NONE
ENTREPRENEURSHIP, CO-OPS & OTHER FORMS OF BUSINESS OWNERSHIP	OR			NONE	NONE
HOUSING EDUCATION	4CHC31 2	15		4CNS111	NONE
<b>TOTAL</b>		<b>122</b>			

**BACHELOR OF CONSUMER SCIENCE (HOSPITALITY AND TOURISM) 4BSC56**

<b>FACULTY</b>	FACULTY OF SCIENCE AND AGRICULTURE				
<b>DEPARTMENTS:</b>	CONSUMER SCIENCE				
<b>DEGREE (DESIGNATOR)</b>	BACHELOR OF CONSUMER SCIENCE (HOSPITALITY AND TOURISM)				
<b>QUALIFIER</b>	CONSUMER SCIENCE & HOSPITALITY				
<b>ABBREVIATION</b>	B CONS SC				
<b>QUALIFICATION CODE (SAQF)</b>					
<b>UNIZULU CODE</b>	4BSC56				
<b>EXIT NQF LEVEL</b>	7				
<b>ADMISSION REQUIREMENTS</b>	NSC WITH DEGREE ENDORSEMENT				
<b>ADMISSION REQUIREMENTS</b>	28 POINTS				
<b>ADMISSION REQUIREMENTS</b>	ENGLISH AT LEVEL 4				
<b>MINIMUM CREDITS FOR ADMISSION</b>	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT AND WITH 28 NSC POINTS				
<b>MINIMUM DURATION OF STUDIES</b>	3 YEARS				
<b>PRESENTATION MODE OF SUBJECTS:</b>	DAY CLASSES				
<b>INTAKE FOR THE QUALIFICATION:</b>	JANUARY				
<b>REGISTRATION CYCLE FOR THE SUBJECTS:</b>	JANUARY				
<b>READMISSION:</b>	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES				
<b>TOTAL CREDITS TO GRADUATE:</b>	405				
<b>FIRST YEAR</b>					
<b>SUBJECT NAME</b>	<b>SUBJECT CODE</b>	<b>SUBJECT CREDITS</b>	<b>NQF LEVEL</b>	<b>PREREQUISITE SUBJECT(S)</b>	<b>CO-REQUISITE SUBJECT(S)</b>
<b>SEMESTER 1</b>					
PRACTICAL ENGLISH 1A	1ENG121	16	5		
COMPUTER LITERACY 1	4CPS121	16	5		
INTRODUCTION TO TOURISM	1RTO111	16	5		
INTRODUCTION TO HOSPITALITY MANAGEMENT	4CHT111	15	5		
<b>SEMESTER 2</b>					
INTRODUCTION TO HUMAN NUTRITION	4CNU112	15	6		
FOOD HYGIENE & SAFETY	4CFH112	15	6		

BUSINESS TOURISM & ENTREPRENEURSHIP	1RTO112	16	6		
BASIC FOOD PREPARATION & CULINARY SKILLS	4CFD112	15	6		4CFH112
COMPUTER LITERACY II	4CPS122	16	5		
<b>YEAR LONG FOR FIRST YEAR</b>					
UNIZULU 101	UZUL100	16	5		
<b>TOTAL</b>		<b>140</b>			
<b>SECOND YEAR SEMESTER 1</b>					
TOURISM DEVELOPMENT	1RTO121	16	6		
RECREATION & TOURISM EVENTS MANAGEMENT A	1RTO221	16	6		
MEAL PLANNING & MANAGEMENT	4CFD211	15	6	4CFD112, 4CFH112	
NUTRITION IN THE LIFE CYCLE	4CNU211	15	7	4CNU112	
<b>SECOND YEAR SEMESTER 2</b>					
TOURISM MANAGEMENT	1RTO122	16	6		
RECREATION & TOURISM EVENTS MANAGEMENT B	1RTO222	16	6		
QUANTITY FOOD PRODUCTION	4CFD212	15	6	4CFD112	4CFD211
ORGANISATION & MANAGEMENT OF FOOD SERVICES	4CFD222	15	6	4CFD112	4CFD211
<b>TOTAL</b>		<b>126</b>			
<b>THIRD YEAR SEMESTER 1</b>					
FOOD & BEVERAGE MANAGEMENT	4CFD311	15	7	4CFD212	
TOURISM RESEARCH A	1RTO311	16	7		
INFORMATION TECHNOLOGY & DISTRIBUTION CHANNELS IN TOURISM	1RTO321	16	7		
EXPERIENTIAL LEARNING IN HOSPITALITY	4CHT319	15	7	4CFD212	4CFD311 4CHT322 4CHT332
<b>THIRD YEAR SEMESTER 2</b>					

HOSPITALITY SERVICE OPERATIONS	4CHT322	15	7		4CHT319 1RTO221 1RTO222 4CHT319
HOSPITALITY LAW	4CHT332	15	7		
TOURISM RESEARCH B	1RTO32 2	16	7		
PRINCIPLES OF DESIGN & INTERIORS	4CHC21 2	15	7		
<b>TOTAL</b>		<b>123</b>			



**S15 DIPLOMA COURSES**

The following tables give the programmes of study for diploma programmes offered by the Faculty.

**(a) Department of Biokinetics and Sport Science****DIPLOMA IN SPORT & EXERCISE TECHNOLOGY****SNDP01**

This qualification is aimed at producing graduates who intend pursuing a career in the field of sport and exercise technology. Graduates who have achieved this qualification will be able to design, implement and manage a physical activity programme for all groups including special populations. They will screen, assess, monitor and manage health-related fitness, lifestyle and wellness programmes. Graduates will be able to provide personal training or lead and instruct safe and effective physical activity participation to meet participants' fitness requirements as well as provide educated advice on lifestyle change for improved well-being. In addition, graduates will have the knowledge for the appropriate referral to other healthcare providers. Employment opportunities include sport coach; sport organiser; health and fitness instructor; fitness adviser for sport teams; sport and fitness/gym manager; lifestyle consultant; school physical education and sport instructor.

<b>FACULTY</b>	Science and Agriculture			
<b>DEPARTMENT:</b>	Biokinetics and Sport Science			
<b>Qualifier</b>	Diploma in Sports and Exercise Technology			
<b>MAJORS</b>	Sport and Exercise Technology 1,2,3; Sport and Physical Recreation Studies 1, Exercise Physiology 2 and 3			
<b>UNIZULU Code</b>	SNDP01			
<b>NQF EXIT Level</b>	6			
<b>Presentation mode of subjects:</b>	Day classes			
<b>Intake for the qualification:</b>	January			
<b>Registration cycle for the subjects:</b>	January			
<b>Total credits to graduate:</b>	376			
<b>FIRST YEAR</b>				
<b>SUBJECT NAME</b>	<b>SUBJECT CODE</b>	<b>SUBJECT CREDITS</b>	<b>NQF LEVEL</b>	<b>PREREQUISIT E SUBJECT(S)</b>
<b>SEMESTER 1</b>				
Sport Didactics and Coaching 1	4HMD119	30	5	
Sport Management 1	4HMD129	30	5	
Sport & Exercise Technology 1	4HMD139	30	5	
Sport & Physical Recreation Studies 1	4HMD149	30	5	
UNIZULU 101	UZUL100	16	5	
<b>TOTAL</b>		<b>136</b>		
<b>SECOND YEAR</b>				
<b>SUBJECT NAME</b>	<b>SUBJECT CODE</b>	<b>SUBJECT CREDITS</b>	<b>NQF LEVEL</b>	<b>PREREQUISIT E SUBJECT(S)</b>
<b>SEMESTER 1</b>				
Human Movement Studies	4HMD219	30	5	
Kinesiology	4HMD239	30	5	
Exercise Physiology II	4HMD229	30	5	4HMD149
Sport & Exercise Technology II	4HMD249	30	5	4HMD139
<b>TOTAL</b>		<b>120</b>		
<b>THIRD YEAR</b>				
<b>SUBJECT NAME</b>	<b>SUBJECT CODE</b>	<b>SUBJECT CREDITS</b>	<b>NQF LEVEL</b>	<b>PREREQUISIT E SUBJECT(S)</b>
<b>SEMESTER 1</b>				

Health Sciences	4HMD329	30	5	4HMD119, 4HMD129, 4HMD139, 4HMD149
Sport & Exercise Technology III	4HMD349	30	5	4HMD249, 4HMD119, 4HMD129, 4HMD139, 4HMD149
Sport Psychology	4HMD319	30	5	4HMD119, 4HMD129, 4HMD139, 4HMD149
Exercise Physiology III	4HMD339	30	5	4HMD229, 4HMD119, 4HMD129, 4HMD139, 4HMD149
<b>TOTAL</b>		<b>120</b>		

#### **(b) Department of Consumer Sciences**

This program offers training to students who are keen to enter the hospitality industry and seek employment in a variety of lodging and guest service occupations as owners or managers. Graduates of the Diploma Hospitality Management will be equipped with supervisory and managerial skills in areas such as hotels and restaurants, accommodation management, food and beverage management, front office, banqueting or as entrepreneurs where they will be responsible for quality control, effective use of equipment, hygiene and safety, stock control, compilation and adhering to budget procedures, problem identification and resolution as well as liaising with different divisions of an organization and industry.

Teaching of a high standard is offered and students have the use of sophisticated and well-equipped kitchens and a dining area. Students will do six months Work Integrated Learning in their third year to prepare them for their career in the hospitality industry.

#### **DIPLOMA HOSPITALITY MANAGEMENT**

**4DIP02**

<b>FACULTY</b>	Science and Agriculture
<b>DEPARTMENT:</b>	Consumer Sciences
<b>Qualifier</b>	Diploma in Hospitality Management
<b>Majors</b>	Food and Beverage Studies 1,2 Culinary Studies 1,2,3, 4 Hospitality Operations 1,2,3 Hospitality Management 2,3 Work Integrated Learning
<b>UNIZULU Code</b>	4SDIP02
<b>NQF EXIT Level</b>	6
<b>Presentation mode of subjects:</b>	Day classes
<b>Intake for the qualification:</b>	January
<b>Registration cycle for the subjects:</b>	January
<b>Total credits to graduate:</b>	360
<b>FIRST YEAR</b>	

SUBJECT NAME	SUBJECT CODE	SUBJECT CREDITS	SUBJECT LEVEL	PREREQUISITE SUBJECT(S)
<b>SEMESTER 1</b>				
Accounting for Hospitality	4HHA111	15	5	Phased out Equivalent to 4HMC111
Hospitality Communications	4HHC111	8	5	None
Hotel Health And Safety	4HMG111	15	5	None
Hospitality Information Systems 1	4HMI111	8	5	None
Hospitality Operations 1 - Accommodation	4HMP111	8	6	None
Food And Beverage Studies 1	4HMB111	15	6	Equivalent to 4HMB112
Culinary Studies 1	4HMC111	15	5	Equivalent to 4HHA111
<b>SEMESTER 2</b>				
Culinary Studies 2	4HMC112	15	5	None
Hospitality Information Systems 2	4HMI112	8	6	None
Hospitality Management 1 - Applied Principles	4HMM112	8	5	None
Hospitality Financial Management 1	4HMF112	8	6	Equivalent to 2CHM112
Nutrition	4HMG112	8	5	None
Service Excellence	4HMG122	8	5	Equivalent to 4HMG121
<b>TOTAL</b>		<b>124</b>		
<b>SECOND YEAR</b>				
SUBJECT NAME	SUBJECT CODE	SUBJECT CREDITS	SUBJECT LEVEL	PREREQUISITE SUBJECT(S)
<b>SEMESTER 1</b>				
Culinary Studies 2 (R)	4HMC211	15	5	4HMC112 Phased out 4HMC111
Culinary Studies 3	4HMC221	15	6	4HMC111 4HMC112
German For Hospitality 1	4HGH111	8	6	Equivalent to 1GHM111
Hospitality Management 2 – Human Resources	4HMM211	15	6	None
Hospitality Industry Law 1	4HML211	8	6	Equivalent to 4HML212

Hospitality Behavioural Studies	4HMG211	8	5	Equivalent to 4HMG212
<b>SEMESTER 2</b>				
Culinary Studies 3 (R)	4HMC212	15	5	4HMC112 Phased out 4HMC111
Culinary Studies 4	4HMC222	15	6	4HMC111, 4HMC112
Food And Beverage Studies 2	4HMB212	15	6	SHMB111/4HMB111 Equivalent to SHMB211
Events Management	4HHM212	8	6	4HMB111 4HMC111 4HMC112 Equivalent to 4HHM211
German For Hospitality 2	4HGH112	8	6	Equivalent to 1GHH112
Hospitality Operations 2 – Front Office	4HMP212	15	6	None
<b>TOTAL</b>		<b>115</b>		
<b>THIRD YEAR</b>				
<b>SUBJECT NAME</b>	<b>SUBJECT CODE</b>	<b>SUBJECT CREDITS</b>	<b>SUBJECT LEVEL</b>	<b>PREREQUISITE SUBJECT(S)</b>
<b>SEMESTER 1</b>				
Hospitality Financial Management 2	4HMF311	15	6	4HMF112
Hospitality Information Systems 3	4HMI311	15	6	4HMI111 4HMI112
Hospitality Industry Law 2	4HML311	8	6	None
Hospitality Management 3 – Entrepreneurship	4HMM311	8	6	None
Hospitality Operations 3- Facility Planning	4HMP311	15	6	None
<b>SEMESTER 2</b>				
WORK INTEGRATED LEARNING	4HMG312	60	6	All first year modules, 4HHM212 4HMB212 4HMP212
<b>TOTAL</b>		<b>121</b>		
<b>TOTAL FOR DIPLOMA</b>		<b>360</b>		



**(C) DEPARTMENT OF NURSING SCIENCE****BACHELOR OF NURSING**

<b>FACULTY</b>	FACULTY OF SCIENCE AND AGRICULTURE
<b>DEPARTMENT:</b>	NURSING SCIENCE
<b>DEGREE(DESIGNATOR)</b>	BACHELOR OF NURSING
<b>QUALIFIER</b>	GENERAL NURSING AND MIDWIFERY
<b>ABBREVIATION</b>	B NURSING
<b>QUALIFICATION CODE (SAQSF)</b>	BACHELOR OF NURSING
<b>UNIZULU CODE</b>	
<b>EXIT NQF LEVEL</b>	<b>8</b>
<b>ADMISSION REQUIREMENTS</b>	NSC WITH DEGREE ENDORSEMENT
<b>ADMISSION REQUIREMENTS</b>	MINIMUM OF 30 POINTS
<b>ADMISSION REQUIREMENTS</b>	ENGLISH 4 POINTS AND LIFE SCIENCES 4 POINTS
<b>MINIMUM CREDITS FOR ADMISSION</b>	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT AND WITH 30 NSC POINTS
<b>MINIMUM DURATION OF STUDIES</b>	4 YEARS
<b>PRESENTATION MODE OF SUBJECTS:</b>	DAY CLASSES
<b>INTAKE FOR THE QUALIFICATION:</b>	JANUARY
<b>REGISTRATION CYCLE FOR THE SUBJECTS:</b>	JANUARY
<b>READMISSION:</b>	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES
<b>TOTAL CREDITS TO GRADUATE:</b>	544

**BACHELOR OF NURSING**

<b>FACULTY</b>	FACULTY OF SCIENCE AND AGRICULTURE
<b>DEPARTMENT:</b>	NURSING SCIENCE
<b>DEGREE(DESIGNATOR)</b>	BACHELOR OF NURSING
<b>QUALIFIER</b>	GENERAL NURSING AND MIDWIFERY
<b>ABBREVIATION</b>	B NURSING
<b>QUALIFICATION CODE (SAQSF)</b>	BACHELOR OF NURSING
<b>UNIZULU CODE</b>	
<b>EXIT NQF LEVEL</b>	<b>8</b>
<b>ADMISSION REQUIREMENTS</b>	NSC WITH DEGREE ENDORSEMENT
<b>ADMISSION REQUIREMENTS</b>	MINIMUM OF 30 POINTS
<b>ADMISSION REQUIREMENTS</b>	ENGLISH 4 POINTS AND LIFE SCIENCES 4 POINTS
<b>MINIMUM CREDITS FOR ADMISSION</b>	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT AND WITH 30 NSC POINTS
<b>MINIMUM DURATION OF STUDIES</b>	4 YEARS
<b>PRESENTATION MODE OF SUBJECTS:</b>	DAY CLASSES
<b>INTAKE FOR THE QUALIFICATION:</b>	JANUARY

<b>REGISTRATION CYCLE FOR THE SUBJECTS:</b>	JANUARY
<b>READMISSION:</b>	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES
<b>TOTAL CREDITS TO GRADUATE:</b>	544

Module	NQF Level	Credits	Compulsory/ Optional	Prerequisites/ Co-requisites
<b>YEAR 2 SEMESTER 1</b>				
Medical Biophysics	6	16	Compulsory	Human Anatomy & Physiology 1A Human Anatomy & Physiology 1B
General Nursing Science 1A	6	16	Compulsory	Fundamental Nursing 1A Fundamental Nursing 1B Human Anatomy & Physiology 1A Human Anatomy & Physiology 1B
Pharmacology	6	16	Compulsory	Nil
Primary Care Nursing 1A	6	16	Compulsory	Fundamental Nursing 1A Fundamental Nursing 1B
<b>YEAR 2 SEMESTER 2</b>				
Medical Biochemistry	6	16	Compulsory	Medical Biophysics
General Nursing Science 1B	6	16	Compulsory	Fundamental Nursing 1A Fundamental Nursing 1B Human Anatomy & Physiology 1A Human Anatomy & Physiology 1B
Primary Care Nursing 1B	6	16	Compulsory	Fundamental Nursing 1A Fundamental Nursing 1B
Professional Informatics & Communication in Nursing	6	16	Compulsory	Nil
<b>TOTAL CREDITS</b>				<b>128</b>

YEAR 3 SEMESTER 1				
General Nursing Science 2 A	7	16	Compulsory	General Nursing Science 1A General Nursing Science 1B Medical Biophysics Medical Biochemistry
Rural Health Care Priorities	7	16	Compulsory	Primary Care Nursing 1A Primary Care Nursing 1B
Maternal Health & New-Born Care 1A (Low Risk)	7	32	Compulsory	General Nursing Science 1A General Nursing Science 1B Human Anatomy & Physiology 1A Human Anatomy & Physiology 1B Medical Biophysics Medical Biochemistry
YEAR 3 SEMESTER 2				
General Nursing Science 2B	7	16	Compulsory	General Nursing Science 1A General Nursing Science 1B
Maternal Health & New-Born Care 1B (High Risk)	7	32	Compulsory	General Nursing Science 1A General Nursing Science 1B Human Anatomy & Physiology 1A Human Anatomy & Physiology 1B Medical Biophysics Medical Biochemistry
Principles and Practice of Nursing	7	16	Compulsory	Nursing Ethos and Professional Practice
<b>TOTAL CREDITS</b>				<b>128</b>
YEAR 4 SEMESTER 1				
Research Methods and Approaches in Nursing	8	16	Compulsory	Nil
Mental Health Nursing 1 A	8	16	Compulsory	General Nursing Science 2A General Nursing Science 2B
Nursing Management 1 A	8	16	Compulsory	Nil

Maternal Health & New-Born Care 2A	8	32	Compulsory	Maternal Health & New-Born Care 1A (Low Risk)Maternal Health & New-Born Care 1B (High Risk)
<b>YEAR 4 SEMESTER 2</b>				
Research Proposal	8	16	Compulsory	Nil
Nursing Management 1 B	8	16	Compulsory	Nil
Mental Health Nursing 1B	8	16	Compulsory	General Nursing Science 2A General Nursing Science 2B
Maternal Health & New-born Care 2B	8	32	Compulsory	Maternal Health & New-Born Care 1A (Low Risk)Maternal Health & New-Born Care 1B (High Risk)
<b>TOTAL CREDITS</b>				<b>160</b>
<b>OVERALL TOTAL CREDITS</b>				<b>544</b>

**BACHELOR OF NURSING IN EDUCATION AND ADMINISTRATION  
4BSC61**

**ONLY FOR PIPELINE STUDENTS – NO NEW STUDENTS TO REGISTER FOR THIS PROGRAMME**

<b>FACULTY</b>	FACULTY OF SCIENCE AND AGRICULTURE
<b>DEPARTMENT:</b>	NURSING SCIENCE
<b>DEGREE(DESIGNATOR)</b>	BACHELOR OF NURSING
<b>QUALIFIER</b>	EDUCATION AND ADMINISTRATION
<b>ABBREVIATION</b>	BNURS (EDUCATION AND ADMINISTRATION)
<b>QUALIFICATION CODE (SAQSF)</b>	BACHELOR OF NURSING IN EDUCATION AND ADMINISTRATION
<b>UNIZULU CODE</b>	<b>4BSC61</b>
<b>EXIT NQF LEVEL</b>	<b>7</b>
<b>ADMISSION REQUIREMENTS</b>	AN ADVANCED DIPLOMA OR EQUIVALENT QUALIFICATION OR A BACHELOR'S DEGREE IN NURSING AND A MINIMUM OF TWO (2) YEARS OF EXPERIENCE AFTER REGISTRATION. REGISTRATION WITH THE SOUTH AFRICAN NURSING COUNCIL (SANC) AS A GENERAL NURSE AND MIDWIFE
<b>MINIMUM CREDITS FOR ADMISSION</b>	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT AND WITH 30 NSC POINTS
<b>MINIMUM DURATION OF STUDIES</b>	3 YEARS
<b>PRESENTATION MODE OF SUBJECTS:</b>	DAY CLASSES
<b>INTAKE FOR THE QUALIFICATION:</b>	JANUARY

REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY				
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES				
TOTAL CREDITS TO GRADUATE:	384				
SECOND YEAR					
SUBJECT NAME	SUBJECT CODE	SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	COREQUISITE SUBJECT(S)
SEMESTER 1					
TEACHING & LEARNING THEORIES IN NURSING & TEACHING STRATEGIES	SNED211	16	6	SNED111 SNED122	
DYNAMICS OF NURSING MANAGEMENT	SNMG211	16	6	SNMG111 &112	
INTRODUCTION TO PSYCHOLOGY	1PSY111	16	5		
PUBLIC ADMINISTRATION 1A	2PAD101	16	5		
SEMESTER 2					
CURRICULUM DEVELOPMENT MULTIMEDIA & TUTORIAL TECHNIQUES	SNED212	16	6	SNED122	
CHANGE MANAGEMENT AND IMPLEMENTATION	SNMG212	16	6	SNMG111, SNMG112	
APPLIED PSYCHOLOGY	1PSY112	16	6		
PUBLIC ADMINISTRATION 1B	2PAD102	16	6		
TOTAL		120			
THIRD YEAR					
SUBJECT NAME	SUBJECT CODE	SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	COREQUISITE SUBJECT(S)
SEMESTER 1					
CURRENT ISSUES & TRENDS IN NURSING EDUCATION	SNED311	16	7	SNED111, SNED112,SNED 122, SNED212, SNED211	
INTERNATIONAL VIEWPOINTS ON NURSING MANAGEMENT	SNMG311	16	7	SNMG111, SNMG112, SNMG211, SNMG212	
RESEARCH PROPOSAL & LITERATURE REVIEW	SNRS311	16	7		
INTRODUCTION TO SOCIOLOGY	1SGY111	16	5		
SEMESTER 2					
NURSING SCHOOL MANAGEMENT	SNMG322	16	7		
NATIONAL HEALTH SYSTEM AND QUALITY ASSURANCE	SNMG312	16	7	4NMG111,4NMG 112,4NMG211 4NMG212	
DATA COLLECTION & ANALYSIS. RESEARCH REPORT	SNRS312	16	7		
INDUSTRIAL SOCIETIES	1SGY112	16	6		
TOTAL		120			

**S16.1 BSc Augmented streams**

In the Augmented streams, the first academic year of study will be spread over the first two years of registration with half of the curriculum being taken in each year. The regular first year courses in Physics, Chemistry, Mathematics, Botany and Zoology as well as the first year service courses in Physics, Chemistry and Mathematics will be taught as augmented courses. Identical material will be covered at the same pace as the mainstream courses but the augmented courses will be taught separately and will have double the contact time (6 lectures, 1 practical and 3 tutorial hours) with specific augmented stream lecturers. Close contact will be maintained between the mainstream and the augmented lectures. At the end of each semester, mainstream and augmented students will write the same final examinations. The continuous assessment marks for each group will be derived on a similar basis.

Rule S.5 (Exclusion Rules) applies to students in the augmented programme.

For administrative purposes, students will be placed in either the Life Sciences or the Physical Sciences stream depending upon which academic programme they have indicated that they wish to follow. Students in each stream will follow a common curriculum in their first year and in their second year they will take the modules relevant to their chosen academic programme. Following the completion of the augmented stream, students will register for their chosen programme and will start at the second academic year of the programme.

<b>4BSC98 BSC AUGMENTED PHYSICAL SCIENCE</b>	
<b>FACULTY</b>	<b>FACULTY OF SCIENCE AND AGRICULTURE</b>
<b>DEPARTMENTS:</b>	SCIENCE ACCESS
<b>DEGREE(DESIGNATOR)</b>	BACHELOR OF SCIENCE
<b>QUALIFIER</b>	
<b>MAJORS</b>	<b>PHYSICAL SCIENCES</b>
<b>ABBREVIATION</b>	BSC
<b>QUALIFICATION CODE (SAQF)</b>	
<b>UNIZULU CODE</b>	4BSC98
<b>EXIT NQF LEVEL</b>	7
<b>ADMISSION REQUIREMENTS</b>	A PASS OF AT LEAST 40% (LEVEL 3) IN MATHEMATICS
<b>ADMISSION REQUIREMENTS</b>	A PASS OF AT LEAST 40% (LEVEL 3) IN ENGLISH
<b>ADMISSION REQUIREMENTS</b>	A PASS OF AT LEAST 40% (LEVEL 3) IN PHYSICAL SCIENCE
<b>MINIMUM CREDITS FOR ADMISSION</b>	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS
<b>MINIMUM DURATION OF STUDIES</b>	4 YEARS
<b>PRESENTATION MODE OF SUBJECTS:</b>	DAY CLASSES
<b>INTAKE FOR THE QUALIFICATION:</b>	JANUARY
<b>REGISTRATION CYCLE FOR THE SUBJECTS:</b>	JANUARY
<b>READMISSION:</b>	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES

TOTAL CREDITS TO GRADUATE:	400					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQUISITE SUBJECT(S)	CO-REQUISITE SUBJECT(S)
FIRST YEAR SEMESTER 1						
CLASSICAL MECHANICS (AUG)	4LPH111	C	16	5		4LMH111
CALCULUS I (AUG)	4LMH111	C	16	5		
TOTAL			32			
FIRST YEAR SEMESTER 2						
ELECTROMAGNETISM & NUCLEAR PHYSICS (AUG)	4LPH112	C	16	6		4LMH112
CALCULUS II (AUG)	4LMH112	C	16	6		4LMH111
TOTAL			32			
YEAR LONG FIRST YEAR MODULE						
UNIZULU 101	UZUL100	C	16	5		
SECOND YEAR SEMESTER 1						
GENERAL CHEMISTRY	4CHM111 E	E	16	5		
INTRODUCTORY COMPUTING	4CPS111 B	E	16	5		
DISCRETE MATHEMATICS	4AMT111 G	E	16	5		
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	E	16	5		
INTRO TO PHYSICAL ENVIRONMENTAL GEOGRAPHY	4GES111 H	E	16	5		
COMPUTER LITERACY I	4CPS121		16	5		
HUMAN MOVEMENT SCIENCE 1A	4HMS111 H	E	16	5		
TOTAL			48			
SECOND YEAR SEMESTER 2						
GENERAL CHEMISTRY	4CHM112 E	E	16	6		4CHM111
INTRO TO SYSTEMS PROGRAMMING	4CPS112 B	E	16	6		4CPS111
FURTHER DISCRETE MATHEMATICS	4AMT122 G	E	16	6		4LMH112 4AMT111
STATISTICS FOR SCIENCE STUDENTS	4STT112 E	E	16	6		4STT111 4LMH112
INTRO TO GEOLOGY	4HYD112 D	E	16	6		
COMPUTER LITERACY II	4CPS122		16	6		
INTRO TO HUMAN GEOGRAPHY	4GES112 H	E	16	6		
HUMAN MOVEMENT SCIENCE 1B	4HMS112 H	E	16	6		
TOTAL			48			

4BSC99 BSC AUGMENTED LIFE SCIENCE						
FACULTY	FACULTY OF SCIENCE AND AGRICULTURE					
DEPARTMENTS:	SCIENCE ACCESS					
DEGREE(DESIGNATOR)	BACHELOR OF SCIENCE					
QUALIFIER						
MAJORS	LIFE SCIENCES					
ABBREVIATION	BSC					
QUALIFICATION CODE (SAQF)						
UNIZULU CODE	4BSC99					
EXIT NQF LEVEL	7/8					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 40% (LEVEL 3) IN MATHEMATICS					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 40% (LEVEL 3) IN ENGLISH					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 40% (LEVEL 3) IN LIFE SCIENCE					
ADMISSION REQUIREMENTS	A PASS OF AT LEAST 40% (LEVEL 3) IN PHYSICAL SCIENCE					
MINIMUM CREDITS FOR ADMISSION	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT WITH AT LEAST 28 NSC POINTS					
MINIMUM DURATION OF STUDIES	4 OR 5 YEARS					
PRESENTATION MODE OF SUBJECTS:	DAY CLASSES					
INTAKE FOR THE QUALIFICATION:	JANUARY					
REGISTRATION CYCLE FOR THE SUBJECTS:	JANUARY					
READMISSION:	SUBJECT TO PRIOR PERFORMANCE AND CURRENT APPLICABILITY OF PASSED MODULES					
TOTAL CREDITS TO GRADUATE:	400 OR 528 DEPENDING ON THE PROGRAMME OF STUDY					
SUBJECT NAME	SUBJECT CODE		SUBJECT CREDITS	NQF LEVEL	PREREQ UISITE SUBJECT (S)	CO-REQUISIT E SUBJECT (S)
<b>FIRST YEAR SEMESTER 1</b>						
BASIC CHEMISTRY 121 (AUG)	4LCH121	C	16	5		
CLASSICAL MECHANICS&PROPERTI ES OF MATTER (AUG)	4LPH121	C	16	5		
<b>TOTAL</b>			<b>32</b>			
<b>FIRST YEAR SEMESTER 2</b>						



BASIC CHEMISTRY 122 (AUG)	4LCH122	C	16	6		
MATHS&STATS FOR EARTH&LIFE SCIENCES (AUG)	4LMH122	C	16	6		
<b>TOTAL</b>			<b>32</b>			
<b>YEAR LONG FIRST YEAR MODULE</b>						
UNIZULU 101	UZUL100	C	16	5		
<b>SECOND YEAR SEMESTER 1</b>						
CYTOLOGY, GENETICS &PHYSIOLOGY (AUG)	4LBT111	E	16	5		
COMPUTER LITERACY I	4CPS121 X	C	16	5		
INTRODUCTION TO ZOOLOGY I (AUG)	4LZL111	E	16	6		
INTRO TO PHYSICAL& ENVIRONMENTAL GEOGRAPHY	4GES111 H	E	16	6		
HUMAN MOVEMENT SCIENCE 1A	4HMS111 H	E	16	5		
ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	4STT111 E	E	16	6		
<b>TOTAL</b>			<b>48</b>			
<b>SECOND YEAR SEMESTER 2</b>						
MORPHOLOGY & TAXONOMY	4BOT112	E	16	6		4LBT111
INTRODUCTION TO ZOOLOGY II	4ZOL112	E	16	6		4LZL111
INTRO TO GEOLOGY	4HYD112 D	E	16	6		
INTRO TO HUMAN GEOGRAPHY	4GES112 H	E	16	6		
HUMAN MOVEMENT SCIENCE 1B	4HMS112 H	E	16	6		
COMPUTER LITERACY II	4CPS122 X	C	16	6		
<b>TOTAL</b>			<b>48</b>			

The foundation stream is incorporated into the programmes specified above, with the first academic year being devoted to the completion of four fully foundational year-length courses, in core science subjects, together with two semester-length courses in English, communication skills and academic literacy. Each of the science courses will carry a credit weight of 4 credits and these will address fundamental concepts, and progress to include a component of NQF level 5 material. The English courses each have a credit weight of 8 credits and will address fundamental literacy related topics, and progress to cover specific scientific literacy concepts set at NQF level 5.

Students must pass all of the prescribed courses that comprise the foundation programme, in order to progress to the first year of degree study. Students who do not fulfil this requirement, are not eligible to repeat failed courses or to repeat the foundation year as a whole.

For administrative purposes, all students following the foundation stream will be placed under the same qualification code, but they will be required to indicate which academic programme they intend to pursue after the completion of the foundation year.

**BSC FOUNDATION PROGRAMME****4BSC00**

<b>FACULTY</b>	<b>FACULTY OF SCIENCE AND AGRICULTURE</b>				
<b>DEPARTMENTS:</b>	SCIENCE ACCESS				
<b>DEGREE(DESIGNATOR)</b>	FOUNDATION				
<b>UNIZULU CODE</b>	<b>4BSC00</b>				
<b>EXIT NQF LEVEL</b>	5				
<b>ADMISSION REQUIREMENTS</b>	NATIONAL SENIOR CERTIFICATE WITH DEGREE ENDORSEMENT AND WITH 26 NSC POINTS				
<b>ADMISSION REQUIREMENTS</b>	A PASS OF AT LEAST 40% (LEVEL 3) IN MATHEMATICS				
<b>ADMISSION REQUIREMENTS</b>	A PASS OF AT LEAST 40% (LEVEL 3) IN ENGLISH				
<b>ADMISSION REQUIREMENTS</b>	A PASS OF AT LEAST 40% (LEVEL 3) IN LIFE SCIENCES				
<b>ADMISSION REQUIREMENTS</b>	A PASS OF AT LEAST 30% (LEVEL 2) IN PHYSICAL SCIENCES				
<b>MINIMUM DURATION OF STUDIES</b>	1 YEAR				
<b>PRESENTATION MODE OF SUBJECTS:</b>	DAY CLASSES				
<b>INTAKE FOR THE QUALIFICATION:</b>	JANUARY				
<b>REGISTRATION CYCLE FOR THE SUBJECTS:</b>	JANUARY				
<b>FIRST YEAR</b>					
<b>SUBJECT NAME</b>	<b>SUBJECT CODE</b>	<b>SUBJECT CREDITS</b>	<b>NQF LEVEL</b>	<b>PREREQUISITE SUBJECT(S)</b>	<b>CO-REQUISITE SUBJECT(S)</b>
<b>SEMESTER 1</b>					
ENGLISH LITERACY 1	4FLT111	8	5		
<b>SEMESTER 2</b>					
ENGLISH LITERACY 2	4FLT112	8	5	4FLT111	

<b>YEAR LONG MODULES</b>					
FOUNDATION BIOLOGY	4FBL119	4	5		
FOUNDATION CHEMISTRY	4FCH119	4	5		
FOUNDATION MATHEMATICS	4FMH119	4	5		
FOUNDATION PHYSICS	4FPH119	4	5		
<b>TOTAL</b>		<b>32</b>			

#### **List of Modules Offered by the Faculty**

All modules are semester-length and set at 16 credits except where otherwise indicated. The timetable group that each module is in is indicated in the column on the right (X indicates that the module does not have pre-scheduled classes on the timetable)

#### **List of Undergraduate Degree Modules**

<b>YEAR 1 SEMESTER 1</b>				
<b>DEPARTMENT</b>	<b>CODE</b>	<b>TITLE</b>	<b>NQF</b>	<b>TT</b>
<b>APPLIED MATHEMATICS</b>	<b>4AMT111</b>	<b>DISCRETE MATHEMATICS</b>	<b>5</b>	<b>G</b>
<b>BOTANY</b>	4BOT111	INTRODUCTION TO PLANT CYTOLOGY, GENETICS AND PHYSIOLOGY	5	E
<b>CHEMISTRY</b>	4CHM111	GENERAL CHEMISTRY 111	5	E
	4CHM121	BASIC CHEMISTRY 121	5	G
<b>CONSUMER SCIENCES</b>	4CHT111	INTRODUCTION TO HOSPITALITY MANAGEMENT	5	B
	4CNS111	HOUSEHOLD AND CONSUMER STUDIES	5	E
<b>COMPUTER SCIENCE</b>	4CPS111	INTRODUCTORY COMPUTING	5	B
	4CPS121	COMPUTER LITERACY I	5	X
<b>GEOGRAPHY</b>	4GES111	INTRODUCTION TO PHYSICAL AND ENVIRONMENTAL GEOGRAPHY	5	H
<b>HUMAN MOVEMENT</b>	4HMS111	HUMAN MOVEMENT SCIENCE 1A	5	H
<b>MATHEMATICS</b>	4MTH111	CALCULUS I	5	F
<b>PHYSICS</b>	4PHY111	CLASSICAL MECHANICS AND PROPERTIES OF MATTER	5	A
	4PHY121	CLASSICAL MECHANICS AND PROPERTIES OF MATTER FOR BIOLOGICAL SCIENCES	5	C
	4PHY131	PHYSICS FOR CONSUMER SCIENCES 8 CREDIT MODULE	5	H
<b>STATISTICS</b>	4STT111	ELEMENTARY STATISTICS FOR SCIENCE STUDENTS	5	E
	4STT121	MATHEMATICS AND STATISTICS FOR COMMERCE STUDENTS	5	B/D
<b>ZOOLOGY</b>	4ZOL111	INTRODUCTION TO ZOOLOGY I	5	A
	4ZOL121	HUMAN ANATOMY AND PHYSIOLOGY I	5	B
<b>CSIRD</b>	UZUL100	UNIZULU 101	5	X

YEAR 2 SEMESTER 1				
	CODE	TITLE	NQF	TT
AGRICULTURE	4AAE211	INTRODUCTION TO EXTENSION AND RURAL DEVELOPMENT	6	D
	4AAG211	INTRODUCTION TO SOIL SCIENCE	6	E
	4AAS211	INTRODUCTION TO ANIMAL SCIENCE	6	B
APPLIED MATHEMATICS	4AMT211	DYNAMICAL SYSTEMS AND MATHEMATICAL MODELLING	6	E
BIOCHEMISTRY	4BCH211	BIOMOLECULES AND ENZYMOLOGY	6	H
BOTANY	4BOT211	PLANT GROWTH AND DEVELOPMENT. FLORAL PROPAGATION	6	G
CHEMISTRY	4CHM211	ANALYTICAL AND INORGANIC CHEMISTRY 2	6	G
CONSUMER SCIENCES	4CFD211	MEAL PLANNING AND MANAGEMENT	6	F
	4CFS211	FOOD PROCESSING TECHNOLOGIES	6	E
	4CNS211	HOUSEHOLD RESOURCE MANAGEMENT	6	A
	4CNU211	NUTRITION IN THE LIFECYCLE	6	C
COMPUTER SCIENCE	4CPS211	DATA STRUCTURES AND ALGORITHMS	6	D
	4CPS221	COMPUTER ARCHITECTURE AND ASSEMBLERS	6	B
	4CPS231	COMPUTER COMMUNICATIONS AND NETWORKS	6	A
GEOGRAPHY	4GES211	GLOBAL LANDFORMS AND CARTOGRAPHY	6	C/D
HUMAN MOVEMENT SCI.	4HMS211	HUMAN MOVEMENT SCIENCE II A	6	F
HYDROLOGY	4HYD211	INTRODUCTION TO SURFACE WATER HYDROLOGY	6	F
MATHEMATICS	4MTH221	ADVANCED CALCULUS	6	H
MEDICAL SCIENCE	4MCB211	INTRODUCTION TO VIRUSES AND HIV/AIDS	6	F
MICROBIOLOGY	4MCB211	PROKARYOTES CLASSIFICATION AND MICROBIAL TECHNIQUES	6	D
	4MCB221	PROKARYOTES STRUCTURE AND ENVIRONMENTAL MICROBIOLOGY	6	A
PHYSICS	4PHY211	MECHANICS, SPECIAL RELATIVITY AND PROPERTIES OF MATTER	6	C
STATISTICS	4STT211	DISTRIBUTION THEORY	6	C
ZOOLOGY	4ZOL211	ANIMAL ANATOMY AND PHYSIOLOGY	6	C

YEAR 1 SEMESTER 2				
DEPARTMENT	CODE	TITLE	NQF	TT
APPLIED MATHEMATICS	4AMT122	FURTHER DISCRETE MATHEMATICS	6	G
BOTANY	4BOT112	PLANT MORPHOLOGY, TAXONOMY AND AN INTRODUCTION TO MYCOLOGY	6	E
CHEMISTRY	4CHM112	GENERAL CHEMISTRY 112	6	E
	4CHM122	BASIC CHEMISTRY 122	6	G

	4CHM132	CHEMISTRY FOR CONSUMER SCIENCES <b>8 CREDIT MODULE</b>	5	H
<b>CONSUMER SCIENCES</b>	4CFD112	BASIC FOOD PREPARATION / CULINARY STUDIES	6	B
	4CFH112	FOOD HYGIENE AND SAFETY	6	D
	4CFS112	INTRODUCTION TO FOOD SCIENCE	6	A
	4CNU112	INTRODUCTION TO HUMAN NUTRITION	6	E
<b>COMPUTER SCIENCE</b>	4CPS112	INTRODUCTORY SYSTEMS PROGRAMMING	6	B
	4CPS122	COMPUTER LITERACY II	5	X
<b>GEOGRAPHY</b>	4GES112	INTRODUCTION TO HUMAN GEOGRAPHY	6	H
<b>HUMAN MOVEMENT</b>	4HMS112	HUMAN MOVEMENT SCIENCE 1B	6	H
<b>HYDROLOGY</b>	4HYD112	INTRODUCTION TO GEOLOGY	6	D
<b>MATHEMATICS</b>	4MTH112	CALCULUS II	6	F
	4MTH122	MATHEMATICS AND STATISTICS FOR EARTH AND LIFE SCIENCES	5	C
<b>PHYSICS</b>	4PHY112	NUCLEAR PHYSICS, ELECTROMAGNETISM, MODERN PHYSICS	6	A
	4PHY122	NUCLEAR PHYSICS, ELECTROMAGNETISM, MODERN PHYSICS FOR BIOLOGICAL SCIENCES	6	C
<b>STATISTICS</b>	4STT112	STATISTICS FOR SCIENCE STUDENTS	6	E
	4STT122	ELEMENTARY STATISTICS FOR COMMERCE STUDENTS	5	D/ B
<b>ZOOLOGY</b>	4ZOL112	INTRODUCTION TO ZOOLOGY II	6	A
	4ZOL122	HUMAN ANATOMY AND PHYSIOLOGY II	6	B
<b>CSIRD</b>	UZUL100	UNIZULU 101	5	X

<b>YEAR 2 SEMESTER 2</b>				
<b>DEPARTMENT</b>	<b>CODE</b>	<b>TITLE</b>	<b>NQF</b>	<b>TT</b>
<b>AGRICULTURE</b>	4AAE212	INTRODUCTION TO AGRICULTURAL ECONOMICS & FARM MANAGEMENT	6	D
	4AAE222	EXTENSION METHODS	6	E
	4AAG212	INTRODUCTION TO CROP PRODUCTION	6	F
	4AAS212	PRINCIPLES OF ANIMAL PRODUCTION	6	B
<b>APPLIED MATHEMATICS</b>	4AMT212	INTRODUCTION TO OPERATIONS RESEARCH	6	E
<b>BIOCHEMISTRY</b>	4BCH212	METABOLISM	6	H
	4BCH222	BIOCHEMISTRY: PRINCIPLES AND TECHNIQUES	6	A
<b>BOTANY</b>	4BOT212	PLANT ANATOMY, TAXONOMY AND BIODIVERSITY	6	G

<b>CHEMISTRY</b>	4CHM212	ORGANIC AND PHYSICAL CHEMISTRY 2	6	G
<b>CONSUMER SCIENCES</b>	4CFD212	QUANTITY FOOD PRODUCTION	6	F
	4CFD222	OPERATION AND MANAGEMENT OF FOOD SERVICES	6	G
	4CFS212	FOOD PRODUCT DEVELOPMENT	6	E
	SCHC212	PRINCIPLES OF DESIGN AND INTERIORS	6	H
	4CNS212	CONSUMER AND THE MARKET	6	A
	SCTC212	CLOTHING AND TEXTILES I	6	C
<b>COMPUTER SCIENCE</b>	4CPS212	INTRODUCTORY SOFTWARE ENGINEERING	6	D
	4CPS232	DATABASE AND INFORMATION MANAGEMENT I	6	A
	4CPS242	VISUAL APPLICATION DEVELOPMENT	6	F
<b>GEOGRAPHY</b>	4GES212	DEMOGRAPHICS, HEALTH AND SUSTAINABLE DEVELOPMENT	6	C/ D
	4GES222	HYDROMETEOROLOGY	6	B
<b>HUMAN MOVEMENT SCIENCE</b>	4HMS212	HUMAN MOVEMENT SCIENCE II (BIOKINETICS)	6	F
<b>HYDROLOGY</b>	4HYD212	INTRODUCTION TO SUBSURFACE HYDROLOGY	6	F
	4HYD222	GEOGRAPHICAL INFORMATION SYSTEMS	6	PE P H
<b>MATHEMATICS</b>	4MTH222	LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS	6	H
<b>MICROBIOLOGY</b>	4MCB212	MICROBIAL GROWTH AND MEDICAL MICROBIOLOGY	6	D
<b>PHYSICS</b>	4PHY212	MODERN PHYSICS PHOTONICS AND WAVES	6	C
	4PHY222	ELECTROMAGNETISM	6	A
<b>STATISTICS</b>	4STT212	STATISTICAL INFERENCE	6	C
<b>ZOOLOGY</b>	4ZOL212	ANIMAL DIVERSITY	6	C

YEAR 3 SEMESTER 1				
DEPARTMENT	CODE	TITLE	NQ F	TT
<b>AGRICULTURE</b>	4AAE311	FARM MANAGEMENT AND RECORD KEEPING SYSTEMS	7	F
	4AAG311	PLANT PROPAGATION	7	G
	4AAS311	FARM ANIMAL ANATOMY AND PHYSIOLOGY	7	A
	4AAS321	ANIMAL BREEDING	7	D
	4AAS331	ANIMAL NUTRITION	7	C
<b>APPLIED MATHS</b>	4AMT321	APPLIED MATHEMATICAL METHODS	7	D
	4AMT331	TENSOR ANALYSIS	7	

<b>BIOCHEMISTRY</b>	4BCH311	GENE EXPRESSION AND REPLICATION	7	A
	4BCH321	METABOLIC REGULATION	7	C
<b>BOTANY</b>	4BOT311	CYTOLOGY, GENETICS, AND PLANT BIOCHEMISTRY	7	B
	4BOT321	AQUATIC BOTANY AND LOWER PLANT TAXONOMY	7	D
<b>CHEMISTRY</b>	4CHM311	ORGANIC CHEMISTRY 3	7	B
	4CHM321	PHYSICAL CHEMISTRY 3	7	D
<b>CONSUMER SCIENCES</b>	4CFD311	FOOD AND BEVERAGE MANAGEMENT	7	H
	4CFD321	FOOD MARKETING	7	C
	4CFS311	FOOD PRODUCT DEVELOPMENT	7	D
	SCHC311	HOUSING EDUCATION AND ENVIRONMENT	7	G
	4CHT319	EXPERIENTIAL LEARNING IN HOSPITALITY (YEAR-LENGTH COURSE)	7	X
	SCIN319	INTERNSHIP FOR NUTRITION (YEAR-LENGTH COURSE)	7	X
	4CNU311	COMMUNITY NUTRITION AND FOOD SECURITY	7	A
	4CNU321	THERAPEUTIC NUTRITION	7	G
	4CNU331	NUTRITION EDUCATION AND TRAINING	7	C
	SCRM311	RESEARCH METHODS	7	B
<b>COMPUTER SCIENCE</b>	4CPS311	ADVANCED PROGRAMMING TECHNIQUES	7	E
	4CPS321	SYSTEMS PROGRAMMING (OS AND COMPILERS)	7	G
	4CPS331	DATABASE AND INFORMATION MANAGEMENT II	7	A
<b>GEOGRAPHY</b>	4GES311	URBAN ENVIRONMENT AND RECREATION PLANNING	7	A
	4GES321	ATMOSPHERIC PROCESSES AND POLLUTION	7	E
	4GES331	LAND USE AND NATURAL RESOURCES MANAGEMENT	7	C
	4GES341	CLIMATE DYNAMICS AND WEATHER VARIABILITY AND PREDICTION	7	G
<b>HUMAN MOVEMENT SCIENCE</b>	4HMS311	HUMAN MOVEMENT SCIENCE III A	7	B
	4HMS321	HUMAN MOVEMENT SCIENCE III C	7	D
<b>HYDROLOGY</b>	4HYD311	SURFACE WATER HYDROLOGY	7	A
	4HYD321	GROUNDWATER HYDROLOGY	7	C
<b>MATHEMATICS</b>	4MTH311	ABSTRACT ALGEBRA	7	A
	4MTH321	REAL ANALYSIS	7	C
<b>MEDICAL SCIENCE</b>	4MCB311	EPIDEMIOLOGY & PATHOGENESIS OF INFECTIOUS DISEASES. ANTIMICROBIAL CHEMOTHERAPY	7	G

	4MCB321	IMMUNOLOGY AND SEROLOGY	7	B
<b>MICROBIOLOGY</b>	4MCB311	FOOD MICROBIOLOGY AND FOOD ANALYSIS	7	E
<b>PHYSICS</b>	4PHY311	QUANTUM AND STATISTICAL PHYSICS	7	H
	4PHY321	ELECTRONIC CIRCUITS AND DEVICES	7	F
<b>STATISTICS</b>	4STT311	RANDOM PROCESSES	7	F
	4STT321	EXPERIMENTAL DESIGN	7	H
<b>ZOOLOGY</b>	4ZOL311	ANIMAL ECOLOGY I	7	F
	4ZOL321	ANIMAL ECOLOGY II	7	H

<b>YEAR 3 SEMESTER 2</b>			<b>NQF</b>	<b>TT</b>
<b>AGRICULTURE</b>	4AAE312	ENTREPRENEURSHIP, CO-OPS AND OTHER FORMS OF BUSINESS OWNERSHIP	7	A
	4AAE322	PRINCIPLES OF PRODUCTION ECONOMICS	7	F
	4AAG312	PLANT BREEDING	7	G
	4AAG322	CROP PROTECTION	7	B
	4AAS312	DIGESTIVE PHYSIOLOGY	7	A
	4AAS322	ANIMAL HEALTH	7	D
	4AAS332	PIG AND POULTRY PRODUCTION	7	C
<b>APPLIED MATHEMATICS</b>	4AMT312	ADVANCED CLASSICAL MECHANICS	7	B
	4AMT322	NUMERICAL METHODS	7	D
<b>BIOCHEMISTRY</b>	4BCH312	RECOMBINANT DNA TECHNOLOGY	7	A
	4BCH322	BIOCHEMISTRY OF NUTRITION	7	G
<b>BOTANY</b>	4BOT312	PEOPLE AND PLANTS	7	B
	4BOT322	PLANT CONSERVATION AND MANAGEMENT, AND TERRESTRIAL ECOLOGY	7	D
<b>CHEMISTRY</b>	4CHM312	INORGANIC CHEMISTRY 3	7	B
	4CHM322	ANALYTICAL CHEMISTRY 3	7	D
<b>CONSUMER SCIENCES</b>	4CFD312	FOOD MARKETING	7	A
	SCHC312	HOUSING EDUCATION AND ENVIRONMENT	7	H
	4CHT322	HOSPITALITY SERVICE OPERATIONS	7	G
	4CNS312	GENDER, DEVELOPMENT AND TECHNOLOGY	7	G
	4CNU312	NUTRITION EDUCATION AND TRAINING	7	A
	SCTC312	CLOTHING AND TEXTILES II	7	F
	4CPS312	DISTRIBUTED SYSTEMS DEVELOPMENT	7	E
<b>COMPUTER SCIENCE</b>	4CPS322	FINAL YEAR PROJECT	7	G
	4CPS332	CLIENT / SERVER COMPUTING	7	A
	STFS312	FOOD TECHNOLOGY II (ALCOHOLIC FERMENTATION)	7	B



<b>FOOD SCIENCE AND TECHNOLOGY</b>	STFS322	QUALITY ASSURANCE AND CONTROL	7	F
<b>GEOGRAPHY</b>	4GES312	ENVIRONMENTAL MANAGEMENT	7	E
	4GES322	ENVIRONMENTAL FIELDWORK AND RESEARCH	7	G
<b>HUMAN MOVEMENT SCIENCE</b>	4HMS312	HUMAN MOVEMENT SCIENCE III B	7	B
	4HMS322	HUMAN MOVEMENT SCIENCE III D	7	D
<b>HYDROLOGY</b>	4HYD332	HYDROLOGICAL MODELLING	7	A
	4HYD342	WATER RESOURCES MANAGEMENT	7	C
<b>MATHEMATICS</b>	4MTH312	GRAPH THEORY	7	A
	4MTH322	COMPLEX ANALYSIS	7	C
<b>MEDICAL SCIENCE</b>	4MCB312	CLINICAL BIOCHEMISTRY	7	E
<b>MICROBIOLOGY</b>	4MCB312	ENVIRONMENTAL INFLUENCES ON MICRO-ORGANISMS AND PRINCIPLES OF INDUSTRIAL MICROBIOLOGY	7	E
	4MCB322	BIOTECHNOLOGY	7	X
<b>PHYSICS</b>	4PHY312	NUCLEAR PHYSICS AND APPLICATIONS	7	H
	4PHY322	SOLID STATE PHYSICS AND MATERIALS SCIENCE	7	F
<b>STATISTICS</b>	4STT312	LINEAR MODELS	7	F
	4STT322	TIME SERIES	7	H
<b>ZOOLOGY</b>	4ZOL312	ECOPHYSIOLOGY AND ECOTOXICOLOGY	7	F
	4ZOL322	RESEARCH DESIGN AND APPLICATION	7	H
<b>YEAR 4 SEMESTER 1 (ALL NQF 8)</b>				
<b>AGRICULTURE</b>	4AAE411	AGRIFINANTIAL MANAGEMENT AND MARKETING AND MARKETING		H
	4AAE421	RISK MANAGEMENT		B
	4AAE441	AGRIBUSINESS RESEARCH PROJECT I		C
	4AAG411	SOIL FERTILITY MANAGEMENT AND CONSERVATION		E
	4AAG421	FLORICULTURE		D
	4AAG441	AGRONOMY RESEARCH PROJECT I		B
	4AAS411	PASTURE ECOLOGY AND MANAGEMENT		E
	4AAS421	ANIMAL REPRODUCTION		G
	4AAS431	APPLIED ANIMAL NUTRITION		F
	4AAS441	ANIMAL SCIENCE RESEARCH PROJECT I		H
<b>CONSUMER SCIENCES</b>	SCIN419	INTERNSHIP FOR EXTENSION AND RURAL DEVELOPMENT (YEAR-LENGTH COURSE, 16 CREDITS)		X
<b>YEAR 4 SEMESTER 2 (ALL NQF 8)</b>				

<b>AGRICULTURE</b>	4AAE412	FARM PLANNING	H
	4AAE422	AGRICULTURAL POLICY AND INTERNATIONAL TRADE AND INTERNATIONAL TRADE	B
	4AAE442	AGRIBUSINESS RESEARCH PROJECT II	C
	4AAG412	HORTICULTURAL CROP PRODUCTION	E
	4AAG422	APPLIED PLANT BREEDING	D
	4AAG432	FIELD CROP PRODUCTION	C
	4AAG442	AGRONOMY RESEARCH PROJECT II	B
	4AAS412	APPLIED PIG AND POULTRY PRODUCTION	E
	4AAS422	APPLIED RUMINANT PRODUCTION	G
	4AAS432	APPLIED ANIMAL SCIENCE	F
	4AAS442	ANIMAL SCIENCE RESEARCH PROJECT II	H
<b>CONSUMER SCIENCES</b>	4CNS412	MANAGEMENT OF COMMUNITY PROGRAMMES	C
	SCRM412	NUTRITION RESEARCH PROJECT	B
	SCRM422	RESEARCH PROJECT	D

### List of BSc Augmented Programme Modules

All of these modules are set at 16 credits and are directly equivalent to the mainstream modules that they correspond to (given in brackets).

<b>AUGMENTED PROGRAMMES SEMESTER 1</b>	4LBT111 (4BOT111)	INTRODUCTION TO PLANT CYTOLOGY, GENETICS AND PHYSIOLOGY (AUGMENTED)
	4LCH121 (4CHM121)	BASIC CHEMISTRY 121 (AUGMENTED)
	4LMH111 (4MTH111)	CALCULUS I (AUGMENTED)
	4LPH111 (4PHY111)	CLASSICAL MECHANICS AND PROPERTIES OF MATTER (AUGMENTED)
	4LPH121 (4PHY121)	CLASSICAL MECHANICS AND PROPERTIES OF MATTER FOR BIOLOGICAL SCIENCE (AUGMENTED)
	4LZL111 (4ZOL111)	INTRODUCTION TO ZOOLOGY I (AUGMENTED)
	UZUL100	UNIZULU 101
<b>AUGMENTED PROGRAMMES SEMESTER 2</b>	4LBT112 (4BOT111)	PLANT MORPHOLOGY, TAXONOMY AND AN INTRODUCTION TO MYCOLOGY (AUGMENTED)
	4LCH122 (4CHM122)	BASIC CHEMISTRY 122 (AUGMENTED)
	4LMH112 (4MTH112)	CALCULUS II (AUGMENTED)
	4LMH122 (4MTH122)	MATHEMATICS AND STATISTICS FOR LIFE AND EARTH SCIENCES (AUGMENTED)
	4LPH112 (4PHY112)	NUCLEAR PHYSICS, ELECTROMAGNETISM, MODERN PHYSICS (AUGMENTED)
	4LZL112 (4ZOL112)	INTRODUCTION TO ZOOLOGY II (AUGMENTED)
	UZUL100	UNIZULU 101

### List of BSc Foundation Programme Modules

All of these modules are year length.

<b>SCIENCE FOUNDATION (FOUNDATION PROGRAMME) YEAR-LENGTH MODULES</b>	4FBL119	LIFE SCIENCES FOUNDATION (4 CREDITS)
	4FMH119	MATHEMATICS FOUNDATION (4 CREDITS)
	4FPH119	PHYSICS FOUNDATION (4 CREDITS)
	4FCH119	CHEMISTRY FOUNDATION (4 CREDITS)
	UZUL100	UNIZULU 101 (16 CREDITS)

### List of English Literacy Modules

The Faculty offers English Literacy modules that are compulsory in both the Foundation and Augmented streams. Each of these modules is worth 8 credits. Students in other programmes may register for these modules and use them in the place of one elective slot in their programme grids.

<b>ENGLISH LITERACY MODULES</b>	4FLT111	ENGLISH LITERACY I (8 CREDITS) SEMESTER 1
	4FLT112	ENGLISH LITERACY II (8 CREDITS) SEMESTER 2

### List of Diploma Modules

<b>YEAR 1</b>		
<b>HUMAN MOVEMENT SCIENCE</b>	SHMD119	SPORT DIDACTICS AND COACHING I <b>(YEAR-LENGTH COURSE, 16 CREDITS)</b>
	SHMD129	SPORT MANAGEMENT I <b>(YEAR-LENGTH COURSE, 24 CREDITS)</b>
	SHMD139	SPORT AND EXERCISE TECHNOLOGY I <b>(YEAR-LENGTH COURSE, 30 CREDITS)</b>
	SHMD149	SPORT AND PHYSICAL RECREATION STUDIES I <b>(YEAR-LENGTH COURSE, 30 CREDITS)</b>
	UZUL100	UNIZULU 101 <b>(YEAR-LENGTH COURSE, 16 CREDITS)</b>
<b>CONSUMER SCIENCES</b>	<b>SEMESTER 1</b>	
	SHMG111	HOTEL HEALTH & SAFETY
	SHMM111	HOSPITALITY MANAGEMENT I <b>(8 CREDITS)</b>
	SHMG121	SERVICE EXCELLENCE <b>(8 CREDITS)</b>
	<b>SEMESTER 2</b>	
	SHMB112	FOOD AND BEVERAGE STUDIES I
	SHMC112	CULINARY STUDIES I
	SHMP112	HOSPITALITY OPERATIONS I <b>(8 CREDITS)</b>
	SHMG112	NUTRITION <b>(8 CREDITS)</b>
<b>YEAR 2</b>		
<b>HUMAN MOVEMENT SCIENCE</b>	SHMD219	HUMAN MOVEMENT STUDIES <b>(YEAR-LENGTH COURSE, 30 CREDITS)</b>
	SHMD229	EXERCISE PHYSIOLOGY II <b>(YEAR-LENGTH COURSE, 30 CREDITS)</b>
	SHMD239	KINESIOLOGY <b>(YEAR-LENGTH COURSE, 30 CREDITS)</b>
	SHMD249	SPORT AND EXERCISE TECHNOLOGY II <b>(YEAR-LENGTH COURSE, 30 CREDITS)</b>
<b>CONSUMER SCIENCES</b>	<b>SEMESTER 1</b>	
	SHMC211	CULINARY STUDIES II
	SHMB211	FOOD AND BEVERAGE STUDIES II
	SHMM211	HOSPITALITY MANAGEMENT II
	<b>SEMESTER 2</b>	
	SHMC212	CULINARY STUDIES III
	SHML212	HOSPITALITY INDUSTRY LAW I <b>(8 CREDITS)</b>
	SHMG212	HOSPITALITY BEHAVIOURAL STUDIES <b>(8 CREDITS)</b>
	SHMP212	HOSPITALITY OPERATIONS II

YEAR 3		
<b>HUMAN MOVEMENT SCIENCE</b>	SHMD319	SPORT PSYCHOLOGY (YEAR-LENGTH COURSE, 30 CREDITS)
	SHMD329	HEALTH SCIENCES (YEAR-LENGTH COURSE, 30 CREDITS)
	SHMD339	EXERCISE PHYSIOLOGY III (YEAR-LENGTH COURSE, 30 CREDITS)
	SHMD349	SPORT AND EXERCISE TECHNOLOGY III (YEAR-LENGTH COURSE, 30 CREDITS)
<b>CONSUMER SCIENCES</b>	<b>SEMESTER 1</b>	
	SHMF311	HOSPITALITY FINANCIAL MANAGEMENT
	SHMI311	HOSPITALITY INFORMATION SYSTEMS III
	SHML311	HOSPITALITY INDUSTRY LAW II (8 CREDITS)
	SHMM311	HOSPITALITY MANAGEMENT III
	SHMP311	HOSPITALITY OPERATIONS III
	<b>SEMESTER 2</b>	
	SHMG312	WORK INTEGRATED LEARNING (60 CREDITS)

#### TRANSDISCIPLINARY MODULE

<b>Title</b>	<b>UNIZULU 101</b>		
<b>Module Code</b>	<b>UZUL100</b>	<b>Department</b>	CSIRD
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim/purpose</b>	The purpose of the module is to unlock the potential of students to meaningfully access the university curriculum in a way that transcends the constraints of knowledge boundaries; generating new forms of thinking and acting. UNIZULU 101 is constructed in ways that build resonance between students' real-life experiences and histories. It is an investment to be returned by the collaborative and innovative growth of socially engaged students in a socially engaged and relevant university.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Theme 1: Introduction to UNIZULU 101</li> <li>• Theme 2: Transformation and Diversity: Human Rights and Gender Equity</li> <li>• Theme 3: Innovation &amp; Entrepreneurship</li> <li>• Theme 4: Poverty, Inequality &amp; Development</li> <li>• Theme 5: Becoming a Proud African Scholar</li> <li>• Theme 6: Ubuntu</li> </ul>		
<b>Outcomes</b>	By the end of the module, students will be able to: <ul style="list-style-type: none"> <li>▪ Address problems in a transdisciplinary way</li> <li>▪ Display critical thinking skills</li> <li>▪ Make meaning of the content of the module and their studies collectively.</li> <li>▪ Acquire academic reading and writing skills.</li> <li>▪ Build confidence in sharing ideas.</li> <li>▪ Display a strong sense of leadership for the public good and civic responsibility.</li> <li>▪ Appreciate and embrace human rights, gender equity and diversity.</li> </ul>		
<b>Assessment</b>	40% Attendance of module activities 60% Formative Assignments		
<b>DP Requirement</b>	50%		

<b>FSA Programmes including UNIZULU 101</b>	<ol style="list-style-type: none"> <li>1. 4BSC98 BSC AUGMENTED PHYSICAL SCIENCE</li> <li>2. 4BSC99 BSC AUGMENTED LIFE SCIENCE</li> <li>3. 4BSC00 BSC FOUNDATION</li> <li>4. 4BSC55 BACHELOR OF CONSUMER SCIENCE (EXTENSION AND RURAL DEVELOPMENT)</li> <li>5. 4BSC56 BACHELOR OF CONSUMER SCIENCE (HOSPITALITY AND TOURISM) 4NDP01 NATIONAL DIPLOMA IN SPORT AND EXERCISE TECHNOLOGY</li> </ol>
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## Department of Agriculture

### **STAFF**

Professor and HOD	GE Zharare, BScHons (Crop Science) (University of Zimbabwe), MScCrop (Physiology) (Reading University, UK), PhD (Agronomy) (Queensland, AUS)
Associate Professors	KC Lehloeny, BSc (Agriculture) (NUL), BScAgricHons, MSc (Agriculture), PhD (Agriculture) (UFS)
Senior Lecturer	FN Fon, BSc (Biochemistry) (Buea, Cameroon), BScHons (Biochemistry), MSc (Agriculture), PhD (Agriculture) (UKZN)
Lecturers	M Sibanda, BSc (Agriculture Economics), BScHons (Agriculture Economics), MSc Agriculture, (Agriculture Economics), PhD (Agriculture Economics) (UFH)
	BS Tlali, BSc (Agric Econ) (UNIZULU), MSc (Agric Econ) (UP)
	SP Dlodla, BSc (Agriculture) (Animal Science), BScHons (Agriculture), MSc (Agriculture) (UNIZULU)
	GH Wilsenach, BSc (Agric Econ), BScHons (Bus Admin) (SU), NDip (Agriculture), BTech (MUT)
	NM Motsa, Dip (Agriculture), BSc (Agriculture) (UNISWA), MSc (Agronomy) (UP), PhD (Crop Science) (UKZN)
nGAP	S Phoku (ask HoD to provide qualification information)
	KPM Lekola
	ZL Ndou
Secretary	RT Phakathi, Dip (Pub Admin), BA (Development Studies) (UNIZULU), HDip (Community Work) (UNIZULU)
Laboratory Technician	L Maupa, NDip (Analytical Chemistry) (N. Gauteng)
Senior Laboratory Assistant	RS Hlophe, BScHons (Biochemistry) (UNIZULU), MSc (Agriculture) (UNIZULU)
Laboratory Assistants	S Moloi, BSc (Agriculture) (Animal Health) (NWU), MSc (Animal Nutrition) Kaposvari University –Hungary
Farm Manager	M Sibanda, BSc (Agriculture Economics), BScHons (Agriculture Economics), MSc Agriculture, (Agriculture Economics), PhD (Agriculture Economics) (UFH)
Farm Foreman	Vacant
Farm Driver	MF Mathenjwa
Farm Assistants	A Biyela
	N Biyela
	H Duma
	B Khumalo
	K Khumalo
	SW Makhathini
	Z Mthiyane
	P Mthiyane
	E Ndlovu
	G Ngema
	S Nzuz
	SL Tshabalala
	K Zwane

<b>Plant Science</b>			
<b>Title</b>	<b>Introduction to Soil Science</b>		
<b>Code</b>	<b>4AAG211</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	To give an overview of the physical, chemical and biological properties of soils; soil formation, classification, use and conservation.		
<b>Content</b>	The course will include; the importance of soils, factors of soil formation, soil classification and survey, soil physical and chemical properties, soil biological properties, soil organic matter and amendments, significance of soil erosion, soil water and soil conservation.		
<b>Outcomes</b>	Upon successful completion of the course earners will be able to: <ul style="list-style-type: none"> <li>▪ identify and characterize elementary aspects of soil formation,</li> <li>▪ discuss basic soil physical, chemical, biological, and morphological properties, (</li> <li>▪ explain behavior of soils in managed and natural landscapes, and</li> <li>▪ identify soil series in South Africa.</li> </ul>		
<b>Assessment</b>	40% Continuous assessment mark. 60% Final Exams Mark.		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions		

<b>Title</b>	<b>Introduction to crop production</b>		
<b>Code</b>	<b>4AAG212</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4BOT111, 4BOT112	<b>Co-requisites</b>	None
<b>Aim</b>	To gain basic concepts of plant science and soil science as applied to crop production		
<b>Content</b>	Aspects to be studied include; origins of crop production, classification of crop plants, anatomy and morphology of crop plants crop growth and development, external influences on crop growth and development, crop production systems, soil and nutrient requirements of crops, and the general practices in crop production namely land preparation, seeding, fertilization, irrigation, weeding, control of insect pest and diseases and harvesting.		
<b>Outcomes</b>	The learner will be expected to; <ul style="list-style-type: none"> <li>▪ understand the nomenclature in classification of crop plant,</li> <li>▪ be able to relate uses of crop plants to anatomy and morphology of the crop plants,</li> <li>▪ understand factors affecting crop growth and importance of matching crops to their environmental requirements,</li> </ul>		



	<ul style="list-style-type: none"> <li>Understand the general crop production practices as they relate to a crop production cycle.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment mark. 60% Final Exams Mark.
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions

<b>Title</b>	<b>Agricultural Mechanisation and Farm Structures</b>		
<b>Code</b>	4AAG221	Department	Agriculture
<b>Prerequisites</b>	None	Co-requisites	
<b>Aim</b>	The aim of the module is to familiarise students with the types of farm equipment and structures and their role in the crop production.		
<b>Content</b>	Internal combustion engine; Machinery types and selection; Tractors and power units; cultivation equipment, crop establishment equipment and agronomic equipment, forage conservation machinery, crop harvesting, drying ,sorting and grading equipment; crop processing equipment; farm housing; and storage structures; dairy and livestock facilities and equipment;		
<b>Outcomes</b>	Students should be able to: <ul style="list-style-type: none"> <li>Operate basic farm machinery such as knapsack sprayers</li> <li>Analyse the need and role of mechanisation in different farming systems</li> <li>Design a farm plan that strikes a balance between the need for production efficiency and the desire to prevent the replacement of humans with machines leading to loss of employment</li> <li>Develop a simple working plan for a farm inclusive of the appropriate machinery and structures pertinent to named crop and animal production systems.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment mark 60% Final Exams Mark		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions		

<b>Title</b>	<b>Introduction to Soil Physics and Conservation</b>		
<b>Code</b>	4AAG222	Department	Agriculture
<b>Prerequisites</b>	None	Co-requisites	4AAG211
<b>Aim</b>	To provide the learners with the basic knowledge soil physics and the causes and control of soil erosion		
<b>Content</b>	Water in soils: content, infiltration and surface run-off, movement in soils; soil structure and aggregation; soil compaction and		

	consolidation; mechanics, principles and factors affecting rainfall erosion, erodibility of soils; wind erosion; soil conservation practices
<b>Outcomes</b>	By the end of the module students are expected to be able to: <ul style="list-style-type: none"> <li>• Predict the behaviour of water in soils</li> <li>• Report on the dynamics of aggregate formation and breakdown</li> <li>• Summarize factors affecting soil compaction/consolidation and water and wind erosion</li> <li>• Formulate ways to manage soil compaction/consolidation and soil and water erosion</li> </ul>
<b>Assessment</b>	40% Continuous Assessment mark 60% Final Exams Mark
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions

<b>Title</b>	<b>Plant Propagation</b>		
<b>Code</b>	<b>4AAG311</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAG212, 4BOT211, 4BOT212	Co-requisites	
<b>Aim</b>	An introductory plant propagation and nursery management course, designed to provide an understanding of the basics of sexual and asexual propagation and micro-propagation techniques. The emphasis is to acquaint the student with the cultural practices and techniques used in plant propagation, as well as the developmental physiology (science) involved.		
<b>Content</b>	Sexual (seed) propagation as it relates to seed development, germination, dormancy, production handling, and the principles, biology and techniques in asexual propagation and micro propagation of plants.		
<b>Outcomes</b>	The learner will be expected to: <ul style="list-style-type: none"> <li>▪ gain an understanding of the basic principles,</li> <li>▪ biology and methods of plant propagation as practiced in all spheres of plant production.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark. 60% Final Exams Mark		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions		

<b>Title</b>	<b>Plant breeding</b>		
<b>Code</b>	<b>4AAG312</b>	<b>Department</b>	
<b>Prerequisites</b>	4BOT211, 4BOT212	Co-requisites	
<b>Aim</b>	To introduce the students to basic principles and concepts of genetic improvement of crop plants through application of basic qualitative and quantitative genetic principles.		
<b>Content</b>	Introduction to genetics, plant cell components, Cell division, Mendelism, gene interaction, gene and environment, linkage and		

	crossing-over, multiple alleles, sex linkage, cytogenetics and population genetics, DNA finger printing. Theory and principles of plant breeding methodology including population improvement, selection procedures, genotypic evaluation, cultivar development and breeding strategies. Introduction to different breeding strategies for diseases and pest resistance.		
<b>Outcomes</b>	At the end of the course, students will be able to: <ul style="list-style-type: none"> <li>▪ Understand the basic principles of breeding crop plants</li> <li>▪ Select appropriate breeding method in improving a specific crop</li> <li>▪ Solve simple problems in crop plants through application of genetic and plant breeding principles</li> <li>▪ Communicate knowledge related to plant breeding.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exams Mark		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions		
<b>Title</b>	<b>Crop Protection 3A</b>		
<b>Code</b>	<b>4AAG321</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAG212	Co-requisites	None
<b>Aim</b>	The aim of this module is to introduce students to the three groups of organisms (plant pathogens, pests and weeds) which cause losses in crop production and whose collective management constitute the study of Crop Protection.		
<b>Content</b>	Plant diseases – concept of a disease, significance of diseases, disease development, Types of plant pathogens – diseases caused by bacteria, fungi and viruses. Types of plant diseases, diagnosis of plant diseases, plant disease epidemiology. Losses caused by diseases. Insect Pests of Crops; important orders/groups of insect pests of crops (insect pest classification), economically important species of insects attacking crops grown in South Africa – Orthoptera, Hemiptera, Homoptera, Coleoptera, Lepidoptera, Diptera, Hymenoptera, Mites and ticks. Symptoms of insect attack. Losses caused pests. Weeds – concepts of a weed, classification of weeds, identification of weeds, characteristics and adaptation of weeds, weed biology and ecology. Harmful effects of weeds/Losses caused by weeds.		
<b>Outcomes</b>	At the end of the module students will be expected to have: <ul style="list-style-type: none"> <li>▪ Comprehension of the biology and ecology of pathogens, pests and weeds</li> <li>▪ Competence in the Identification of the various plant pathogens, pests and weeds and associated harmful effects.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment mark 60% Final Exams Mark		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions		

<b>Title</b>	<b>Crop Protection</b>		
<b>Code</b>	<b>4AAG322</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	To impart to student's sound concepts on pest and disease management in crop production and giving the learners practical experience on the control of important insect, pathogens and weeds through laboratory and field observations.		
<b>Content</b>	<p>Disease control: Symptoms and signs of diseases; Threshold theories in disease management; Plant disease management strategies – Chemical control, Biological control, Cultural control, Physical control, Regulatory control, Breeding for resistance; Major diseases of cereals, legumes, root crops, tubers, fibre, vegetables and fruits and their control. Integrated management.</p> <p>Pest control: Chemical control methods – insecticides: types, physico-chemical characteristics, formulation, mode of action, efficacy, safety; Application of pesticides; Sprayers, calibration, application; Pesticide resistance. Non-chemical control – legislative control, resistant plants, cultural control, biological control, modifying insect behaviour; Integrated Pest Management</p> <p>Weed control - methods of weed control - Cultural, mechanical, biological control. Chemical - use of herbicides – Classification, structure, physiological effects, mode of action. Application of herbicides. Environmental issues in herbicide use. Non-chemical control – biological, cultural etc. Integrated Weed Management. Weed management in specific cropping systems</p> <p>Integrated Crop Protection (ICP) -the concepts of Integrated Disease Management (IDM), Integrated Pest Management (IPM). ICP strategies and control tactics</p>		

<b>Outcomes</b>	<p>Students should be able to</p> <ul style="list-style-type: none"> <li>▪ Calculate the amounts of chemicals required per area of land and calibrate application equipment to apply the correct quantities</li> <li>▪ Summarize and compare various pest control strategies</li> <li>▪ Plan suitable pest control strategies for pests</li> <li>▪ Develop strategies to prevent pesticide resistance and to ensure environmental safety</li> <li>▪ Predict yield losses due pests, diseases and weeds given different climatic conditions</li> </ul>
<b>Assessment</b>	<p>40% Continuous Assessment mark</p> <p>60% Final Exams Mark</p>
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark</p> <p>80% Attendance of lectures and practical sessions</p>

<b>Title</b>	<b>Crop Protection 3B</b>		
<b>Code</b>	<b>4AAG352</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	None	Co-requisites	4AAG321
<b>Aim</b>	To impart to students advanced sound principles and concepts of pest and disease management in crop production and giving the learners practical experience on the control of important insect, pathogens and weeds through laboratory and field observations.		
<b>Content</b>	<p>Disease control: Symptoms and signs of diseases; Threshold theories in disease management; Plant disease management strategies – Chemical control, Biological control, Cultural control, Physical control, Regulatory control, Breeding for resistance; Major diseases of cereals, legumes, root crops, tubers, fibre, vegetables and fruits and their control. Integrated management.</p> <p>Pest control: Chemical control methods – insecticides: types, physico-chemical characteristics, formulation, mode of action, efficacy, safety; Application of pesticides; Sprayers, calibration, application; Pesticide resistance. Non-chemical control – legislative control, resistant plants, cultural control, biological control, modifying insect behaviour; Integrated Pest Management</p> <p>Weed control - methods of weed control - Cultural, mechanical, biological control. Chemical - use of herbicides – Classification, structure, physiological effects, mode of action. Application of herbicides. Environmental issues in herbicide use. Non-chemical control – biological, cultural etc. Integrated Weed Management.</p> <p>Weed management in specific cropping systems</p> <p>Integrated Crop Protection (ICP) -the concepts of Integrated Disease Management (IDM), Integrated Pest Management (IPM). ICP strategies and control tactics</p>		
<b>Outcomes</b>	<p>Students should be able to</p> <ul style="list-style-type: none"> <li>▪ Calculate the amounts of chemicals required per area of land and calibrate application equipment to apply the correct quantities</li> <li>▪ Summarize and compare various pest control strategies</li> <li>▪ Plan suitable pest control strategies for pests</li> <li>▪ Develop strategies to prevent pesticide resistance and to ensure environmental safety</li> <li>▪ Predict yield losses due pests, diseases and weeds given different climatic conditions</li> </ul>		
<b>Assessment</b>	<p>40% Continuous Assessment mark</p> <p>60% Final Exams Mark</p>		
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark</p> <p>80% Attendance of lectures and practical sessions</p>		

<b>Title</b>	<b>Soil Fertility Management</b>		
<b>Code</b>	<b>4AAG411</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAG211, 4AAG212	Co-requisites	none
<b>Aim</b>	To develop an understanding of soil fertility management options for sustained soil productivity.		
<b>Content</b>	The course will be organized into; Plant growth, nutrition and nutrients, Plant and soil analyses, interpretation and fertilizer recommendations, Fertilizers types, grades and application methods Soil acidity and liming, Soil degradation, Significance of soil erosion, Soil conservation and management		
<b>Outcomes</b>	The learners will gain competences in: <ul style="list-style-type: none"> <li>management of soil fertility from the physical, chemical and biological points of view</li> <li>and to relate soil fertility management to soil conservation.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exams Mark.		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions		

<b>Title</b>	<b>Field crop production</b>		
<b>Code</b>	<b>4AAG432</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAG212, 4AAG311	Co-requisites	4AAG411
<b>Aim</b>	The module is designed to equip learners with knowledge and understanding of the basic principles and practices involved in field crop production.		
<b>Content</b>	<p>Introduction to Field Crop Production: Definitions, significance and overview of field crops with emphasis on those that could be grown in South Africa.</p> <p>Effect of Environmental Factors on Field Crop Production: The role of soil, water, temperature, wind and sunlight in field crop production and the management of these factors for increased yield and quality of the produce.</p> <p>Cultivation Practices in Field Crop Production: Selection of planting material, Spacing, weeding pest control harvesting and transportation</p> <p>Cereal Crop Production: Production of important cereal crops including wheat, maize and sorghum</p> <p>Legume Crop Production: Production of Peas, Beans and other pulses</p> <p>Oil and Fibre Crop Production: Production of important oil crops</p>		
<b>Outcomes</b>	On completion of this module learners will: <ul style="list-style-type: none"> <li>Gain knowledge in the production of field crops,</li> <li>Understand the soil and climatic requirements of the different field crops</li> </ul>		

	<ul style="list-style-type: none"> <li>Have knowledge and skills required in field management, transport and storage facilities required by different field crops</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment mark 60% Final Exams Mark.		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions		
<b>Title</b>	<b>Agronomy Research Project I.</b>		
<b>Code</b>	<b>4AAG441</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAG211, 4AAG212, 4AAG221, 4AAG222	Co-requisites	4AAG311 , 4AAG312 , 4AAG321 , 4AAG352 , 4STT111
<b>Aim</b>	The aim of this module is to develop generic skills for developing and planning research projects and to aid students in understanding the research process and how to approach agricultural research efficiently and effectively.		
<b>Content</b>	Students will be introduced to the philosophical and conceptual basis of methodology and learn the procedures, guidelines, and concepts to enable them to plan and conceptualize a research. Guidance will be given on how to identify a science research project/problem, conduct a literature review, formulate hypotheses, plan a research project to test the hypotheses and write a research proposal for basic and applied research.		
<b>Outcomes</b>	<p>By the end of this course, the student will have an understanding of the scientific method and will be able to:</p> <p>Critically evaluate research literature appropriate for their project subject.</p> <ul style="list-style-type: none"> <li>Use existing research literature to create hypotheses, and justify experimental design choices for testing those hypotheses.</li> <li>Develop a structured scientific research proposal.</li> <li>design</li> <li>Outline project/research management issues.</li> <li>Write a research proposal.</li> </ul>		
<b>Assessment</b>	40% continuous assessment mark 40% project proposal presentation 40% written project proposal		
<b>DP Requirement</b>	40% continuous assessment 80% Attendance of meetings with supervisors		

<b>Title</b>	<b>Fruit Production</b>		
<b>Code</b>	<b>4AAG452</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAG212 4AAG311	Co-requisites	None
<b>Aim</b>	The module is designed to provide students with the theoretical and practical skills required in fruit tree production		
<b>Content</b>	Introduction to fruit tree production. Classification of fruit trees and fruits. Definitions, significance and overview of fruit crops with emphasis on those that could be grown in South Africa. Nutritional values of different fruit crops, social and economic factors in fruit tree production. Effect of environmental factors on fruit crop production. The role of soil, water, temperature, wind and sunlight in fruit crop production and the management of these factors for increased yield and quality of the produce. Cultural practices in fruit tree production. Selection of planting material, spacing, pruning, training, windbreaks, weeding etc. Production of selected fruits		
<b>Outcomes</b>	Students should be able to: <ul style="list-style-type: none"> <li>▪ Design fruit production guidelines for different fruit trees grown in South Africa</li> <li>▪ Perform practical orchard operations such as marking, calculating plant densities and fertiliser amounts, weeding, pruning etc.</li> <li>▪ Design orchard plans incorporating the homestead, fields, roads, waterways etc.</li> <li>▪ Predict the yield of fruit trees given different agro-ecological conditions</li> <li>▪ Plan the production cycles for fruit trees.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment mark 60% Final Exams Mark		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions		

<b>Title</b>	<b>Floriculture and Vegetable Production</b>		
<b>Code</b>	<b>4AAG451</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAG212, 4AAG311	Co-requisites	None
<b>Aim</b>	The module is designed provide learners with basic scientific knowledge of the principles and practices involved in floricultural crop production.		
<b>Content</b>	Production of specific floriculture and vegetable crops with emphasis on environmental manipulation and scheduling of crop growth and development for targeted market and periods. Specific flowering crops are used as models to demonstrate potted flowering plant, cut flower, and bedding plant production systems. Classification of vegetable crops; nursery practices for vegetable crops, land preparation, transplanting, cultural practices, harvesting, processing and storage of produce.		



<b>Outcomes</b>	Students should be able to: <ul style="list-style-type: none"> <li>▪ Classify different vegetable and floriculture crops</li> <li>▪ Classify greenhouses and analyse their environmental control methods for vegetable and ornamental crop production</li> <li>▪ Formulate suitable production methods for selected vegetable and ornamental crops</li> </ul>
<b>Assessment</b>	40% Continuous Assessment mark 60% Final Exams Mark
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions

<b>Title</b>	<b>Seed Science and Technology</b>		
<b>Code</b>	<b>4AAG431</b>	<b>Department:</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAG311, 4AAG312	<b>Co-requisites</b>	
<b>Aim</b>	The aim of the module is to provide a scientific foundation for the production of quality seed for the sustenance of the crop production sector.		
<b>Content</b>	The importance of good quality seed in agriculture; Functions and properties of seeds. Losses from using poor quality seed; Seed biology. The structure of cereal grains and legume seeds. Seed physiology; Seed germination- requirements for germination, seed germination processes; Seed dormancy; Seed vigour, seed longevity and deterioration; Seed production and certification, Cultivar development, Seed multiplication and processing, Seed quality control - seed testing, seed legislation; seed storage behavior, hermetic and cryogenic storage of seeds. Seed gene banking and maintenance of seed gene banks. Seed marketing; Seed in South African agriculture – a case study.		
<b>Outcomes</b>	Students should be able to: <ul style="list-style-type: none"> <li>▪ Plan the production, processing, storage and handling of seeds of both field and horticultural crops.</li> <li>▪ Provide a critical analysis of the South African seed industry</li> <li>▪ Design seed multiplication schemes for various communal areas</li> <li>▪ Predict the yield of different seed crops given a set of climatic and soil conditions</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment mark 60% Final Exams Mark		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions		

<b>Title</b>	<b>Applied Plant Breeding</b>		
<b>Code</b>	<b>4AAG422</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAG311, 4AAG312	<b>Co-requisites</b>	None

<b>Aim</b>	The module is designed to equip learners with knowledge and understanding of the application of breeding techniques for crop improvement.
<b>Content</b>	Introduction to Applied Plant Breeding. Basic concepts in plant breeding. Plant breeding and society, results, benefits and future. Breeding methods and cultivar development. Basic techniques and procedures involved in the breeding of self-pollinated and open pollinated crops and vegetatively multiplied species. Application of molecular biology and biotechnology in plant breeding and multiplication. Genetic engineering, cloning and tissue culture technology. Multiplication and seed quality. Factors to consider in production of high quality seeds, important procedures to be followed in seed multiplication. The role of high quality seed in improvement of yield and the negative effects of contaminants. Registration and variety research. Plant breeders' rights. Field evaluation and breeding efficiency. Yield evaluation and general performance on the field. Practical field breeding techniques.
<b>Outcomes</b>	On completion of this module learners will: <ul style="list-style-type: none"> <li>▪ Understand the basic and applied principles of breeding</li> <li>▪ Gain knowledge in molecular techniques in plant breeding</li> <li>▪ Have practical experience of breeding common food and industrial crops</li> <li>▪ Understand how to produce and handle improved cultivars and maintain their integrity.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment mark 60% Final Exams Mark
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions

<b>Title</b>	<b>Agronomy Research Project II.</b>	
<b>Code</b>	<b>4AAG442</b>	<b>Department: Agriculture</b>
<b>Prerequisites</b>	4AAG211, 4AAG212, 4AAG221, 4AAG222	4AAG311, 4AAG312, 4AAG321, 4AAG352, 4AAG441, 4STT111 4AAG441 must be completed
<b>Aim</b>	This course aims to expose participants to qualitative and quantitative data gathering, processing, analysis and presentation methods and skills. Participants will be exposed to such skills through (i) a hands-on experience with qualitative and quantitative methods (ii) through writing research proposals and (iii) through writing an analytical research report on data they have collected.	
<b>Content</b>	Students will be guided in designing, planning and completing a research project, and in analyzing the experimental data of the project and writing a scientific report.	
<b>Outcomes</b>	At the end of this course, participants should be able to <ul style="list-style-type: none"> <li>▪ Successfully design and complete an independent study project</li> <li>▪ Conduct a scientific experiment in agronomy, and</li> <li>▪ Write a scientific report based on data collected from the experiment, and</li> <li>▪ (d) Orally present a scientific report/paper.</li> </ul>	
<b>Assessment</b>	40% Oral Presentation 70% Written Report.	
<b>DP Requirement</b>	40% Completion of fieldwork according to schedule 80% Attendance of meetings with supervisors	

### ANIMAL SCIENCE

<b>Title</b>	<b>Introduction to Animal Science</b>		
<b>Code</b>	<b>4AAS211</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>		<b>Co-requisites</b>	<b>4ZOL111</b>
<b>Aim</b>	The course is designed to develop an understanding of the global nature of animal production and how it ties into national and local production. The students will develop the basic understanding of the role of the different livestock and poultry. They will become familiar with the terminology used in animal science as it relates to industry and management practices. The course also develops familiarity with the food and other products derived from animals. The students will have a basic understanding of animal nutrition, animal health, animal behavior and genetics		
<b>Content</b>	The animal science industry, Beef, dairy, swine, small ruminants, poultry and animal products, carcass grading, growth, reproduction and reproduction technologies, nutrients, digestion and absorption, nutrient requirements, genetics and animal breeding, animal health, animal behavior, lactation and introduction to pastures.		
<b>Outcomes</b>	The student will have: <ul style="list-style-type: none"> <li>▪ An understanding of the global animal industry</li> <li>▪ Knowledge of food produced/processed from the livestock and poultry</li> <li>▪ A basic knowledge of differences between some farm animal species.</li> <li>▪ Some understanding of how nutrition, animal health, genetics and animal behavior are applicable to livestock farming</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark		
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance of lectures and practical's		

<b>Title</b>	<b>Principles of Animal Production</b>		
<b>Code</b>	<b>4AAS212</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>		<b>Co-requisites</b>	<b>4ZOL112</b>
<b>Aim</b>	This module is designed to introduce students to monogastric and ruminant management and the effect of genotype on production system types.		
<b>Content</b>	Economic importance of dairy, beef, small ruminants, pigs and poultry. Characteristics of different production systems for each of the farm animal categories, suitable production systems for both large and small scale sectors for each of the livestock types with special references to developing countries. Different management systems for ruminants and monogastrics. History and characteristics of breeds of cattle, sheep, goats, pigs and poultry, suitability of breeds to different production environments. Estimating the age of ruminants.		
<b>Outcomes</b>	The student will have:		

	<p>Gained exposure to ruminant and monogastric production units from the field visits to representative sectors.</p> <p>Knowledge of various exotic and indigenous breeds and characteristics among the breeds for monogastrics and for ruminants with special reference to African countries.</p> <p>Some knowledge of ruminants and monogastric products in South Africa.</p> <p>Ability to estimate age of ruminants using incisors.</p> <p>Ability to differentiate between intensive, semi-extensive, extensive/ subsistence production systems in both ruminants and monogastrics.</p>
<b>Assessment</b>	<p>40% Continuous Assessment Mark</p> <p>60% Final Exam Mark</p>
<b>DP Requirement</b>	<p>40% Continuous assessment mark</p> <p>80% Attendance of lectures and practical's</p>

<b>Title</b>	<b>Farm animal anatomy and physiology</b>		
<b>Code</b>	<b>4AAS311</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>		Co-requisites	4AAS212, 4ZOL112
<b>Aim</b>	This module is designed to provide learners with an understanding of the anatomy and physiology of farm animals.		
<b>Content</b>	<p>The anatomy and physiology of farm animals (ruminants and nonruminants), histology and embryology functioning of the physiological processes in livestock under specific conditions. The anatomy and physiology of the respiratory, vascular, digestive, nervous, endocrine, urinary, reproductive, muscular and skeletal systems will be discussed. Physiology of appetite, animal growth, integument (mammary gland and hair fibre), lactation, heart and circulation, immunity and the homeostatic control of the major body systems of domestic animals will be examined.</p>		
<b>Outcomes</b>	<p>The student will understand:</p> <ul style="list-style-type: none"> <li>the external morphology, organ morphology,</li> <li>difference of organs between ruminants and nonruminants and physiological function of domestic animals (ruminant or monogastric) in physical and chemical terms for the efficient animal health and economic production.</li> </ul>		
<b>Assessment</b>	<p>40% Continuous Assessment Mark</p> <p>60% Final Exam Mark</p>		
<b>DP Requirement</b>	<p>40% Continuous assessment mark</p> <p>80% Attendance of lectures and practical's</p>		

<b>Title</b>	<b>Digestive Physiology</b>		
<b>Code</b>	<b>4AAS312</b>	<b>Department:</b>	<b>Agriculture</b>
<b>Prerequisites</b>		Co-requisites:	4AAS211, 4AAS212
<b>Aim</b>	The module is designed to introduce students to aspects of physiology as it relates to digestion, absorption and utilization of nutrients and other		

	substances in farm animals (ruminants and non-ruminants including poultry and equines)
<b>Content</b>	Secretory glands, accessory structures, hormones and peptides of the digestive system of ruminants & non-ruminants, including poultry and equines; digestion, absorption and utilization in ruminants and non-ruminants of carbohydrates, lipids, proteins and non-protein nitrogenous compounds, minerals, vitamins, and phyto-nutrients; inhibitors of digestive enzymes including anti-nutritional factors; digestive disorders and abnormalities; gastrointestinal immunity and gut health; growth factors and gut function; gut microbiology and digestive processes; digestive enzymes and factors affecting their function; nutrient transport systems; stress and other factors in relation to digestive function/processes; toxins and their detoxification in the gastrointestinal tract; control and modification of gut function and digestion.
<b>Outcomes</b>	<p>An understanding of:</p> <ul style="list-style-type: none"> <li>the role of various digestive organs and structures in the secretion of hormones, peptides and enzymes involved in nutrient digestion, absorption and utilization.</li> <li>A knowledge of nutrient digestion, absorption and utilization under normal and abnormal (stressful/toxic) conditions.</li> <li>A knowledge of gut microbiology and its contribution to nutrient digestion</li> </ul> <p>An understanding of digestive functioning</p>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance of lectures and practical's

<b>Title</b>	<b>Animal Health</b>		
<b>Code</b>	<b>4AAS322</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAS211, 4AAS212	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to veterinary terminology, principles and procedures as well as the causes, diagnosis, prevention and treatments of common livestock and poultry diseases.		
<b>Content</b>	<p><b>Theory</b></p> <ul style="list-style-type: none"> <li>veterinary terminology</li> <li>causes of disease</li> <li>general veterinary principles</li> <li>common diseases of livestock and poultry</li> </ul> <p><b>Practical</b></p> <ul style="list-style-type: none"> <li>clinical examination of farm animals including the chicken</li> <li>post mortem examination of farm animals and chickens</li> <li>administration of medications and vaccines</li> <li>collection of laboratory samples</li> <li>basic laboratory techniques</li> </ul>		
<b>Outcomes</b>	On completion of the module students will have a basic knowledge and understanding of:		

	<ul style="list-style-type: none"> <li>the different causes of disease in farm animals</li> <li>clinical examination and recognition of symptoms/ lesions in farm animals</li> <li>general veterinary principles including prevention and treatment of disease</li> <li>general veterinary procedures</li> <li>common disorders/diseases of livestock and poultry</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance of lectures and practical's

<b>Title</b>	<b>Animal Breeding</b>		
<b>Code</b>	<b>4AAS321</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAS211, 4AAS212	<b>Co-requisites</b>	None
<b>Aim</b>	This module is designed to explain: genetic influence on the traits exhibited by farm animals, explain factors that interact with the genes to produce non conformity in animals, selection aids and procedures to select animals for breeding program and how to develop breeding programs.		
<b>Content</b>	Review on mitosis; Meiosis, Mendelian principles, effect and interaction between genes, difference of chromosomal function between that of a fowl and that of a mammalian farm animal. Linkage of gender with the expression of non-sex character traits in specified farm animals, role of mutation in animal breeding. Hardy-Weinberg and forces to change gene frequency. Environmental factors which determine genetic expression in animals, heritability in different classes of livestock, values and measurements of quantitative traits, selection aids, selection methods, response to selection, mating systems, breeding methods, records and some analysis of farm records. Use of performance records, computing of some adjustment factors, performance and progeny testing schemes. General principles of practical breeding, sheep breeding, beef breeding, poultry breeding; Marker assisted selection and QTL, cloning and transgenics, conservation of genetic resources.		
<b>Outcomes</b>	<p>The student will have:</p> <ul style="list-style-type: none"> <li>Understanding of the significance of genes in animal production.</li> <li>Knowledge of the significance of interaction of genes on animal traits</li> <li>Ability to design and analyse animal farm records for various traits</li> <li>Some knowledge for implementation of selection and breeding of farm animals</li> <li>Ability to measure traits of economic importance in livestock</li> <li>Ability to plan implementation of a breeding program using genetic theory, practical applications to daily husbandry practice and management of animal breeding programs</li> <li>Ability to use computerized animal breeding programs</li> <li>Understanding use of biotechnology in animal breeding</li> </ul>		

	<ul style="list-style-type: none"> <li>Explain where it would be appropriate to use each breeding method in animal breeding programs.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance of lectures and practical's

<b>Title</b>	<b>Animal Nutrition</b>		
<b>Code</b>	<b>4AAS331</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAS211, 4AAS212	Co-requisites	None
<b>Aim</b>	To provide students with an understanding of the general principles and concepts of animal nutrition to improve animal production efficiency of agricultural animals (ruminants and nonruminants)		
<b>Content</b>	Fundamentals of animal nutrition; nutrients and their metabolism; feed composition; the nutrient requirements of different animals for different production functions, the measurement of body nutritive requirements and nutritive values; nutritive requirement for body processes and productive functions; nutritional properties of various southern African feed stuffs.		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>Knowledge of small and large stock metabolic requirements,</li> <li>feeding standards applied to agricultural animals,</li> <li>distinction in approach adopted in feeding various types of animals at different productivity levels.</li> <li>Also students should be able to handle problems related to feeding agricultural animals.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark		
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance of lectures and practical's		

<b>Title</b>	<b>Pig and Poultry Production</b>		
<b>Code</b>	<b>4AAS332</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>		Co-requisites	4AAS211, 4AAS212
<b>Aim</b>	This module is designed to introduce students to principles and practical aspects of pig and poultry production/science		
<b>Content</b>	<b>Pig Production</b> Modern pig breeding practices. Breeding systems and methods of genetic improvement. Pig breeding programmes. Pig improvement schemes. Nucleus testing. Multiplication testing. Performance testing. Penetrance. Halothane stress gene in pigs. Traits of economic importance in pigs. Stockmanship and animal handling. Factors affecting pig production viability. Economics of pig production. <b>Poultry Production</b>		



	Poultry housing and equipment. Poultry feeding/nutrition and management. Poultry breeding/genetics, culling and selection. Poultry breeding systems. Economics of poultry production.
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Understanding of principles of pig and poultry production that affect such aspects as choice of housing and feed management</li> <li>▪ Understanding of breeding systems and practices and methods of genetic improvement used in pig and poultry production</li> <li>▪ Knowledge and understanding of the functioning of pig and poultry breeding and pig improvement schemes</li> <li>▪ Knowledge of desirable (economically important) and undesirable traits in pigs and poultry</li> <li>▪ Understanding of the importance of good stockmanship in pig and poultry production</li> <li>▪ Understanding of aspects of economics as regards pig and poultry production</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance of lectures and practical's

<b>Title</b>	<b>Pasture ecology and management</b>		
<b>Code</b>	<b>4AAS411</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAS211, 4AAS212	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to the concepts of and theories applicable to pasture ecology and management		
<b>Content</b>	Objectives of veld management; Growth and defoliation of veld plants; Growth of trees and shrubs and their reaction to treatment; Effect of defoliation on plant communities; Vegetation of South Africa; Veld condition assessment; Grazing management; Grazing systems; Plant and animal relationship; Value of veld as animal feed; Veld burning and its use in veld management. Characteristics of common cultivated pasture varieties, Dynamics of cultivated pastures, Responses of cultivated pastures to defoliation, Establishment and management of cultivated pastures, Fodder flows; Silage and hay; Drought resistant fodder crops, Analysing pastures		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ On completion of the module students will have a basic knowledge and understanding of:</li> <li>▪ The definition of pastures, fodder, rangelands and veld;</li> <li>▪ The importance of pasture science in livestock production;</li> <li>▪ The structural and functional characteristics of fodder in relation to livestock;</li> <li>▪ The principles and systems of veld and pasture management;</li> <li>▪ The assessment of veld and pastures for livestock production.</li> <li>▪ In addition to the specific outcomes, students will develop general writing skills by compiling information from various sources and presenting information in structured reports.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark		

<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance of lectures and practical's
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<b>Title</b>	<b>Animal Reproduction</b>		
<b>Code</b>	<b>4AAS421</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	<b>4AAS322</b>	<b>Co-requisites</b>	<b>4AAS311</b>
<b>Aim</b>	This module is designed to introduce students to the anatomy and physiology of the reproductive system of farm animals as well as common disorders/diseases of the reproductive system. Students will then apply their knowledge of reproductive physiology and diseases when they learn management techniques which affect reproductive performance in animals. They will also learn about procedures and techniques which improve or alter reproductive processes in animals.		
<b>Content</b>	<u>Theory</u> <ul style="list-style-type: none"> <li>• The physiology of reproduction.</li> <li>• Endocrinology of reproduction.</li> <li>• Spermatogenesis and oogenesis.</li> <li>• The oestrus cycle.</li> <li>• Fertilisation, pregnancy, parturition, the puerperium and lactation.</li> <li>• Male mating behaviour.</li> <li>• Disorders and diseases of reproduction.</li> <li>• Measurements of reproductive efficiency.</li> <li>• Reproductive management related to the female.</li> <li>• Reproductive management related to the male.</li> <li>• Environmental management for improved reproduction.</li> <li>• Nutritional management for improved reproduction.</li> </ul> <u>Practical</u> <ul style="list-style-type: none"> <li>• macro and microanatomy of the male and female reproductive organs</li> <li>• Embryology - anatomical development from gamete to foetus.</li> <li>• Semen collection, evaluation, processing, storage and handling.</li> <li>• Artificial insemination.</li> <li>• Oestrus synchronization, superovulation and embryo transfer.</li> <li>• altering male reproduction.</li> <li>• Methods of pregnancy diagnosis.</li> </ul>		
<b>Outcomes</b>	On completion of the module students will have a basic knowledge and understanding of: <ul style="list-style-type: none"> <li>▪ The anatomy and physiology of the male and female reproductive tracts.</li> <li>▪ The endocrinology of reproduction. This includes the endocrine glands, the hormones they produce and the functions these hormones have on reproduction.</li> <li>▪ The various components of the reproductive cycle viz. puberty, gametogenesis, oestrus cycle, fertilisation, pregnancy, parturition and lactation.</li> <li>▪ Reproductive behaviour of male and female animals.</li> </ul>		

	<ul style="list-style-type: none"> <li>▪ The common disorders and diseases of reproduction in farm animals.</li> <li>▪ The measurements of reproductive efficiency.</li> <li>▪ The management of male and female animals to improve reproductive performance.</li> <li>▪ The effects of environment and nutrition on reproduction.</li> <li>▪ Semen collection, processing and artificial insemination.</li> <li>▪ The altering of male reproduction.</li> <li>▪ Oestrus synchronisation, superovulation, embryo transfer and pregnancy diagnosis in the female.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark
<b>DP Requirement</b>	40% Continuous assessment mark; 80% Attendance of lectures and practical's

<b>Title</b>	<b>Applied Animal Nutrition</b>		
<b>Code</b>	<b>4AAS431</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAS331, 4AAS312	Co-requisites	None
<b>Aim</b>	The module is designed to introduce students to various feeding standards, feed resources, feed/ration formulation theory, and the analytical techniques used in feed evaluation		
<b>Content</b>	Nutrient requirements for various classes of farm animals and poultry at various physiological states; nutritive value of feeds; ration formulation for different classes of farm animals and poultry at various physiological states; feed composition and nutrient balance; regulation of feed intake; clinical symptoms of nutritional deficiencies and toxicities; identification of various feed ingredients; and determination of the chemical composition of feedstuffs		
<b>Outcomes</b>	Students will understand: <ul style="list-style-type: none"> <li>▪ the composition and characteristics of the material consumed by the animal, the manner in which this material is metabolized (converted, utilized and excreted) in the digestive tract and body cell,</li> <li>▪ Analyse the various feeds of the farm animals,</li> <li>▪ Formulate rations for farm animals and poultry,</li> <li>▪ The importance of feed analysis and its limitations for efficient animal nutrition,</li> <li>▪ Understand feed intake regulation, feed formulation and computer application.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark		
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance of lectures and practical's		

<b>Title</b>	<b>Animal science research project I</b>		
<b>Code</b>	<b>4AAS441</b>	<b>Department</b>	<b>Agriculture</b>

<b>Prerequisites</b>	4AAS211, 4AAS212	Co-requisites	4AAS331,4AAS332, 4STT111
<b>Aim</b>	This module is designed to develop students' understanding of concepts involved in animal science research		
<b>Content</b>	Each student will be expected to write and present a proposal (including problem identification, literature review, hypotheses/questions to be addressed and methods to be used) for a research project they will do.		
<b>Outcomes</b>	<p>On completion of the module students will have basic knowledge, understanding and experience of planning a research project aimed at addressing a problem concerning a topic in animal science. This will include:</p> <ul style="list-style-type: none"> <li>▪ Reviewing information related to the problem, its significance, reasons for its existence, and possible solutions</li> <li>▪ Writing a proposal to collect and analyse data about the problem</li> <li>▪ Presenting the review and proposed project to peers</li> </ul>		
<b>Assessment</b>	50% written proposal 50% oral presentation of proposal		
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance of meetings with supervisors		

<b>Title</b>	<b>Applied Pig and Poultry Production</b>		
<b>Code</b>	<b>4AAS412</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAS3232	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to practical application aspects of pig and poultry production principles and environmental factors affecting the production of both pigs and poultry (broilers and layers)		
<b>Content</b>	<p><b>Applied Pig Production</b>            Feed intake enhancement and diet selection. Growth enhancement and feed efficiency improvement. Nutritional control of heat stress. Meat quality and its manipulation. Antibiotics and the environment. Feed and animal waste as pig feed. Anti-nutritional factors and toxins and tropical feed resources. Mycotoxins and nutritional control of mycotoxicosis. Reproduction technology. Nutritional influences on gene expression, reproduction and behaviour.</p> <p><b>Applied Poultry Production</b>            Photoperiodic control of poultry performance, reproduction and reproductive physiology. Nutritional control of heat stress. Feed anti-nutritional factors and tropical feed resources. Mycotoxins and nutritional control of mycotoxicosis. Nitrogen excretion and ammonia emissions. Manipulation of egg and meat quality. Antibiotics. Feather pecking and cannibalism. By-products as poultry feed.</p>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Understanding of how principles of pig and poultry science can be used to improve pig production.</li> <li>▪ Ability to integrate and find relationships among various aspects of pig and poultry production.</li> </ul>		

	<ul style="list-style-type: none"> <li>Understanding of the influence of various environmental factors on pig and poultry production</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark
<b>Assessment Criteria</b>	Learners will be expected to: Explain/discuss/illustrate the influence of various factors affecting pig and poultry production Measure the performance of both pigs and poultry under various environmental conditions
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance of lectures and practical's

<b>Title</b>	<b>Applied Ruminant Production</b>		
<b>Code</b>	<b>4AAS422</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAS211, 4AAS212	Co-requisites	None
<b>Aim</b>	To provide learners with an understanding of management principles of ruminants (beef cattle, dairy cattle; sheep and goat). Also, to enable the learners to identify and solve production problems associated with ruminant production systems.		
<b>Content</b>	Ruminant production and management under intensive, semi-intensive and extensive systems including rearing systems and shearing of sheep. Rearing of economically and environmentally feasible livestock to the prevailing marketing standards. Advantages and disadvantages of calving, kidding and lambing different various seasons. Establishment of sustainable ruminant projects in communities. Suitable production systems for various natural regions of southern Africa. Housing parlour systems of different ruminants and meat production. The best and latest managerial techniques used in ruminant farming. Marketing methods of commercial ruminants.		
<b>Outcomes</b>	The learners will know how to establish, to advice and to run a profitable livestock farming unit under prevailing conditions of the southern Africa region. This information is important for mastering both managerial and the technical skills required for running livestock farming business.		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark		
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance of lectures and practical's		

<b>Title</b>	<b>Applied Animal Science</b>		
<b>Code</b>	<b>4AAS432</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAS211, 4AAS212	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to (i) technological aspects of animal production of such products as milk, meat (beef, lamb, chevon, chicken), eggs and wool, and (ii) the science that		

	underlies the production by ruminants of milk, meat/mutton and hair fibre, as well as a study of the various factors – nutrition, reproduction, genetics/breeding, diseases and parasites – that influence ruminant animal production
<b>Content</b>	Animal Science Technology Dairy processing. Meat processing (including freezing, dehydration, salting and curing, smoking, comminution and reconstitution). Egg classification. Wool technology Ruminant Production Science Milk synthesis, production and composition, and factors affecting these. Red meat production, composition and quality, and factors affecting these. Wool, mohair & cashmere production and quality, and factors affecting these. Reproduction in ruminants, and factors affecting it & manipulation thereof. Tropical/sub-tropical feedstuffs & manipulation of their nutritive value. Parasites and diseases and the effects thereof on ruminant production. Modifiers of body tissue growth, milk synthesis and composition. Enhancement of the nutritional quality of meat and milk for consumers. Pro- and anti-biotics in ruminant production
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Understanding and ability to apply various processes and technologies involved in the processing of milk, meat, eggs and wool</li> <li>▪ Understanding of the process of milk synthesis/production, how this can be manipulated and how various factors affect milk production and composition</li> <li>▪ Understanding of body tissue accretion, how this can be manipulated and how various factors affect meat production, composition and quality</li> <li>▪ Understanding of the process of hair fibre production, how fibre production can be manipulated and how various factors affect hair fibre production and quality</li> <li>▪ Understanding of techniques employed to manipulate, and how various factors affect, ruminant reproduction</li> <li>▪ Understanding of techniques used to improve the nutritive value of low-quality feedstuffs for ruminants in the tropics and sub-tropics</li> <li>▪ The influence of parasites and diseases on ruminant production especially in the tropics and sub-tropics</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark
<b>DP Requirement</b>	40% Continuous assessment mark; 80% Attendance of lectures and practical's

<b>Title</b>	<b>Animal science research project II</b>		
<b>Code</b>	<b>4AAS442</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAS211, 4STT111	Co-requisites	4AAS322, 4AAS331, 4AAS332

<b>Aim</b>	This module is designed to develop students' understanding of concepts involved in animal science research
<b>Content</b>	Each student will be expected to collect and analyse data according to a previously approved proposal, report on progress, and write and present a final report on the project.
<b>Outcomes</b>	On completion of the module students will have basic knowledge, understanding and experience of conducting a research project aimed at addressing a problem concerning a topic in animal science. This will include: <ul style="list-style-type: none"> <li>▪ Collecting and analysing the data for the project</li> <li>▪ Writing a scientific report on the project</li> <li>▪ Presentation of the project report to peers</li> </ul>
<b>Assessment</b>	50% written report 50% oral presentation of report
<b>DP Requirement</b>	Completion of fieldwork according to schedule 80% Attendance of meetings with supervisors

## AGRIFINANTIAL MANAGEMENT AND MARKETING

<b>Title</b>	<b>Intro to Agric Economics &amp; Farm Management</b>		
<b>Code</b>	<b>4AAE212</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	This course is designed to introduce students to the field of Agricultural Economics exposing them to the environment in which an agricultural economist operates with an overview of how the agricultural sector has changed in South Africa		
<b>Content</b>	<p>Introduction to Agricultural Economics  Analyzing the career of an economist  The importance of agriculture to humanity  Agricultural situation of developed and developing countries in terms of:</p> <ul style="list-style-type: none"> <li>• The provision of food</li> <li>• Agricultural efficiency to creating a consumer society</li> <li>• Providing a livelihood for farm people</li> <li>• Being custodians of the environment</li> <li>• Evaluating the performance of agriculture</li> </ul> <p>The changing complexion of Agriculture in South Africa  An introduction to different economic systems</p>		
<b>Outcomes</b>	<p>On completion of this course students are expected to:</p> <ul style="list-style-type: none"> <li>▪ be familiar with key terms and concepts in agricultural economics</li> <li>▪ understand and describe the role of agricultural economics in agriculture</li> <li>▪ identify what humanity expects from agriculture</li> <li>▪ judge the extent to which agriculture has fulfilled its role in developing and developed countries</li> <li>▪ examine the role of agriculture in a country's economy</li> <li>▪ understand the dualistic nature of South African agriculture</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical sessions		

<b>Title</b>	<b>Principles of Production Economics</b>		
<b>Code</b>	<b>4AAE322</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAE212, 4AAG 212	Co-requisites	None
<b>Aim</b>	To introduce students to the concept of production economics. To explain the application of production economics in agriculture. To explain the use of production economics and the use of a production function. To introduce students to various techniques that could be used in order to reach specific objectives like profit maximization and optimum input applications or optimum combinations of inputs and outputs.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction to the concept of production economics</li> </ul>		



	<ul style="list-style-type: none"> <li>• Introduction to a production function and its application</li> <li>• The concept of marginality</li> <li>• Law of diminishing marginal returns</li> <li>• The use of input/input applications to determine optimal input applications</li> <li>• The use of input/output application to determine profit maximization.</li> <li>• The use of output/output applications to determine the most profitable combination when more than one product is being produced</li> <li>• Resource Allocation for Multi-product holding</li> <li>• The use of cost principles like marginal cost, average variable cost and average fixed cost to determine optimum production levels.</li> <li>• Breakeven analysis</li> </ul>
<b>Outcomes</b>	<p>After completing this module student will be able to:</p> <ul style="list-style-type: none"> <li>▪ describe the concept of production economics</li> <li>▪ apply the principles of production economics</li> <li>▪ use a production function to determine rational and irrational production areas</li> <li>▪ determine the optimum input application to maximize profit - determine the optimum combinations of more than one input to optimize production</li> <li>▪ determine the optimum combination of two or more products to produce</li> <li>▪ apply cost principles like marginal cost, average variable cost and average total cost to determine optimum production levels</li> <li>▪ determine breakeven point</li> </ul>
<b>Assessment</b>	<p>40% Continuous Assessment Mark 60% Final Exam Mark</p>
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark 80% Attendance of lectures and practical's</p>

<b>Title</b>	<b>Farm Management and Recording Keeping Systems</b>		
<b>Code</b>	<b>4AAE311</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAE212, 4AAG212, 4AAS212	Co-requisites	None
<b>Aim</b>	<p>Expose students to the concept of farm management, the role of a farm manager and the decision making process. To introduce students to sources of information available to farmers when decisions have to be made. To expose students to the records a farm manager should keep and how and why to keep these records. To enable students to draw up basic farm budgets and financial statements such as a cash flow statement, balance sheet and income statement and to interpret the results of the statements.</p>		
<b>Content</b>	<ul style="list-style-type: none"> <li>• General farm management</li> <li>• The role of the manager and the decision making process</li> </ul>		

	<ul style="list-style-type: none"> <li>Sources of external and internal information, and management information systems. The importance of record keeping.</li> <li>Record keeping, why keep records? What information to record</li> <li>Budgeting and the budgeting process.</li> <li>Cash flow statements - Balance sheets - Income statements</li> <li>Methods of analysis of farm records adjustments in farming programmes, measures of success in farming. Interpretation of results</li> </ul>
<b>Outcomes</b>	<p>After completing this module student will be able to:</p> <ul style="list-style-type: none"> <li>understand the concept and the role of a farm manager</li> <li>understand and apply the decision making process</li> <li>know the sources of information available to the manager</li> <li>know which records a manager should keep and why</li> <li>identify what information should be kept in these records</li> <li>compile cash flow statement/budget, a balance sheet and compile an income statement</li> <li>analyse the financial statements and interpret the results</li> </ul>
<b>Assessment</b>	<p>40% Continuous Assessment Mark 60% Final Exam Mark</p>
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark 80% Attendance of lectures and practical's</p>

<b>Title</b>	<b>Entrepreneurship, Co-ops and other forms of Business ownership</b>		
<b>Code</b>	<b>4AAE312</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	<p>This module seeks to equip students with a basic understanding and skills needed to promote entrepreneurship by giving knowledge in the discipline and opportunities to cultivate a problem solving approach and, conceivably, go back to a community and promote entrepreneurship.</p> <p>This module seeks to equip students with an awareness of the different types of business ownership that exists in South Africa. It should also make students aware of the differences, advantages and disadvantages of each business type. More emphasis will be on Co-operatives as they play an important role in South African agriculture. It will therefore seek to equip students with an understanding of the role co-operatives can fulfil in agriculture.</p>		
<b>Content</b>	<p>The concept of entrepreneurship; What is entrepreneurship?; Views on entrepreneurship; Entrepreneurship and economic development; Advantages of entrepreneurship; Myths about entrepreneurship; Success and failures of entrepreneurs; Personality traits of entrepreneurs; The business environment; Macro Environment; Micro Environment; Producer and consumer behavior in a market economy; Elementary theory of demand; Elementary theory of supply; Elementary theory of price determination; Elasticity of demand and supply; The different types of business ownership in South Africa; A sole proprietor ; A partnership; A close corporation ; A company (private &amp; public); A co-</p>		

	operative; Accountability and liability of members or owners of each business type; The history and development of co-operative principles; Modern co-operative principles; Member's responsibilities in a co-operative; Services and types of co-operatives
<b>Outcomes</b>	<p>After completing this module student will be able to:</p> <ul style="list-style-type: none"> <li>Understand the concept of entrepreneurship;</li> <li>Understand the environment in which an enterprise functions;</li> <li>Understand how the environment affects the enterprise and <i>vice versa</i>;</li> <li>Understand basic economic concepts;</li> <li>Understand the theory of price determination;</li> <li>Understand how consumer and producer markets react in a market economy;</li> <li>Raise critical questions concerning entrepreneurship;</li> <li>Be able to find needed information;</li> <li>Appreciate the importance of developing information networks;</li> </ul> <p>After completing this module, students will also be able to have:</p> <ul style="list-style-type: none"> <li>An awareness of the different types of business ownership in South Africa.</li> <li>An understanding of each business type's suitability with special reference to the financial requirements and the liability of owners/shareholders and members.</li> <li>An understanding of the more common legal aspects of each business type.</li> <li>An understanding of the role co-operatives have played in the development of the agricultural sector.</li> <li>An awareness and understanding of co-operative principles and how it functions;</li> <li>An awareness of the legal aspects and responsibility when establishing a co-operative and the process to follow when establishing a co-operation.</li> <li>An understanding of the member's responsibilities in a co-operative.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark; 60% Final Exam Mark
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical's

<b>Title</b>	<b>AGRIFINANTIAL MANAGEMENT AND MARKETING and Marketing</b>		
<b>Code</b>	<b>4AAE411</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAE212	Co-requisites	None
<b>Aim</b>	This module seeks to equip students with a basic understanding and skills needed to establish an enterprise particularly related to agriculture. To expose students to marketing of agricultural products including the changes in agricultural marketing over the past decade.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Identifying business opportunities</li> <li>Establishment and ownership of a business</li> </ul>		

	<ul style="list-style-type: none"> <li>● Business functions</li> <li>● Management functions and techniques</li> <li>● Developing a business plan</li> <li>● Historical background to agricultural marketing</li> <li>● Recent changes in the marketing of agricultural products including specific products traded on SAFEX</li> </ul>
<b>Outcomes</b>	<p>After completing this, module students will be able to:</p> <ul style="list-style-type: none"> <li>▪ be able to go through the process of identifying a business opportunity</li> <li>▪ have an understanding of the different types of business ownership</li> <li>▪ have an understanding of the different business functions</li> <li>▪ have an understanding of the management functions required to manage a business</li> <li>▪ know the components of a business plan</li> <li>▪ Develop a basic business plan.</li> <li>▪ have an understanding of how agricultural marketing has changed</li> <li>▪ have an understanding of the marketing of specific agricultural products</li> </ul>
<b>Assessment</b>	<p>40% Continuous Assessment Mark 60% Final Exam Mark</p>
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark 80% Attendance of lectures and practical's</p>

<b>Title</b>	<b>Risk Management</b>		
<b>Code</b>	<b>4AAE421</b>	<b>Department</b>	<b>Agriculture</b>
<b>Prerequisites</b>	4AAE312, 4AAE311	<b>Co-requisites</b>	None
<b>Aim</b>	<p>This module seeks to equip students with a basic understanding and skills needed to identify uncertainty and risks related to agricultural production.</p> <p>To expose students to developing various strategies to minimize the effects of risk and uncertainty.</p>		
<b>Content</b>	<p>Imperfect knowledge and the farmer Attitudes to uncertainty, and profit maximization Identifying risks and uncertainty Types of risk Dealing with uncertainty Cost of uncertainty Uncertainty and farm planning Managing risk</p>		
<b>Outcomes</b>	<p>After completing this module student will be able to:</p> <ul style="list-style-type: none"> <li>be able to identify and illustrate imperfect knowledge in agriculture</li> <li>have an understanding of attitudes to uncertainty and profit maximization</li> <li>be able to identify and describe different risks and uncertainty</li> </ul>		

	be able to develop various strategies to cope with various types of risk determine the cost of uncertainty be able to manage risk and uncertainty in farming
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical's

<b>Title</b>	<b>Agribusiness research project I</b>	
<b>Code</b>	<b>4AAE441</b>	<b>Department:</b> <b>Agriculture</b>
<b>Prerequisites</b>	4STT120 and all AGRIFINANTIAL MANAGEMENT AND MARKETING Core Modules in 2nd	<b>Co-requisites:</b> None
<b>Aim</b>	This module is designed to introduce students to the theoretical concepts involved in research and research preparation. The course aims to expose students to the world of scientific writing by reviewing published material and thereafter producing and presenting a review paper and a research proposal	
<b>Content</b>	<ul style="list-style-type: none"> <li>• Information Retrieval Skills</li> <li>• How to write a review paper.</li> <li>• Presentation Skills</li> <li>• Introduction to Research</li> <li>• Qualitative and Quantitative Research Methodology</li> <li>• Research Design</li> <li>• Writing a Research Proposal</li> <li>• Analysis of Data</li> <li>• Writing a Research Report</li> </ul>	
<b>Outcomes</b>	After completing this module student will be able to: <ul style="list-style-type: none"> <li>▪ Consult various forms of scientific communications;</li> <li>▪ Identify review papers in journals, conference proceedings and web sites;</li> <li>▪ Review previously published primary papers;</li> <li>▪ Identify trends emanating from different researchers on a specific topic;</li> <li>▪ Write a review paper;</li> <li>▪ Present a review paper;</li> <li>▪ Produce a research proposal, which outlines clearly a plan on how the researcher will conduct the research.</li> </ul>	
<b>Assessment</b>	35 % Written Review Paper 35 % Written Research Proposal 30 % Presentation	
<b>DP Requirement</b>	80% Attendance of contact sessions with supervisor	

<b>Title</b>	<b>Farm Planning</b>	
<b>Code</b>	<b>4AAE412</b>	<b>Department: Agriculture</b>
<b>Prerequisites</b>	4AAE212, 4AAS212, 4AAG212, 4AAS211,	Co-requisites: None
<b>Aim</b>	This module seeks to equip students with the basics of farm planning. It will also give students an opportunity to develop a comprehensive farm plan. The process that the students follow will assist them to develop farm plans in any given area and can also be used as a development project in rural areas.	
<b>Content</b>	<ul style="list-style-type: none"> <li>• The Planning Environment and the Management Function;</li> <li>• The purpose of planning</li> <li>• The dynamic nature of production;</li> <li>• Uncertainty;</li> <li>• Basic principles and Concepts of Planning;</li> <li>• The sequence of decisions in farm planning;</li> <li>• Planning and budgeting</li> <li>• Factors which determine types of farming by location;</li> <li>• Constraints;</li> <li>• Some commonly used Farm Planning Models;</li> <li>• Whole-Farm budgeting;</li> <li>• Partial Budgeting;</li> <li>• Use of Gross Margin Analysis;</li> <li>• Cropping Decisions;</li> <li>• Choice of crops;</li> <li>• Crop production decisions;</li> <li>• Live Stock Decisions;</li> <li>• Planning the kind, amount and system of production</li> <li>• The place of different enterprises;</li> <li>• Circumstances that Influence the Financing of farming Enterprises;</li> <li>• Capital requirements of farming enterprises;</li> <li>• Putting Theory into Practice;</li> <li>• Steps to follow when compiling a farm plan</li> </ul>	
<b>Outcomes</b>	<p>After completing this module student will be able to:</p> <ul style="list-style-type: none"> <li>▪ develop whole or partial farm plans using the following</li> <li>▪ soil survey/soil maps, climatic data.</li> <li>▪ crop selection, animal selection or a combination of crops and animals</li> <li>▪ determine estimated production costs</li> <li>▪ determine potential income or revenue</li> <li>▪ area to be utilized</li> <li>▪ determine the capital required to implement the whole or partial farm plan</li> <li>▪ determine a 5 year cashflow budget</li> <li>▪ present this information in the form of a report.</li> </ul>	
<b>Assessment</b>	<p>40% Continuous Assessment Mark 60% Final Assessment (Farm Plan )</p>	

<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical's
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<b>Title</b>	<b>AGRICULTURAL POLICY AND INTERNATIONAL TRADE</b>		
<b>Code</b>	<b>4AAE422</b>	<b>Department: Agriculture</b>	
<b>Prerequisites</b>	CECN201, CECN102	<b>Co-requisites</b>	None
<b>Aim</b>	This module seeks to equip students with an awareness and an understanding of AGRICULTURAL POLICY AND INTERNATIONAL TRADE at provincial and national level It also seeks to equip students with skills needed to participate in developing and evaluating agricultural policies at national and provincial level in SA. It should also equip students with an understanding of AGRICULTURAL POLICY AND INTERNATIONAL TRADE and its impact on international trade.		
<b>Content</b>	Policy Framework at <ul style="list-style-type: none"> <li>▪ Provincial level</li> <li>▪ National level and International level.</li> <li>▪ Strategic Development Plan for South Africa</li> <li>▪ NEPAD</li> <li>▪ BATAT</li> <li>▪ The National Water Act</li> <li>▪ International Trade Agreements, GATT etc.</li> <li>▪ Any other relevant policy</li> </ul>		
<b>Outcomes</b>	After completing this module student will be able to: Understand the various policies and their impact on the agricultural sector. Be aware of the various trade agreements and their consequences on the agricultural sector		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical's		

Title	Agribusiness research project II	
Code	4AAE442	Department Agriculture
Prerequisites	4STT120 and all AGRIFINANTIAL MANAGEMENT AND MARKETING Core Modules in 2nd year	Co-requisites: Completion of Agribusiness Research Project 1
Aim	This module is designed to introduce students to the practical concepts involved in research. The course aims to expose students to the world of data collection and analysis and scientific writing by doing fieldwork and producing and presenting a research report.	
Content	<ul style="list-style-type: none"><li>• Design Research Instruments</li><li>• Collect data in the field</li><li>• Analyse data</li><li>• Write a research report</li></ul>	

	<ul style="list-style-type: none"> <li>• Present research findings</li> </ul>
<b>Outcomes</b>	<p>On completion of this course students are expected to:</p> <ul style="list-style-type: none"> <li>▪ design research tools,</li> <li>▪ conduct research in the field which entails identifying a research area of interest,</li> <li>▪ conducting a literature review,</li> <li>▪ formulating a hypotheses or problem statement and developing a clear plan to conduct the research,</li> <li>▪ analyse data,</li> <li>▪ write and present a research report</li> </ul>
<b>Assessment</b>	<p>60 % Research Report 40 % Presentation of research findings</p>
<b>DP Requirement</b>	<p>Completion of fieldwork according to schedule 80% Attendance of meetings with supervisors</p>

### AGRICULTURAL EXTENSION & RURAL DEVELOPMENT

<b>Title</b>	<b>Introduction to Extension &amp; Rural Dev</b>		
<b>Code</b>	<b>4AAE211</b>	<b>Department: Agriculture</b>	
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	<p>This module aims to introduce learners to basic concepts, history, philosophy and patterns of extension worldwide, in the Southern Africa region and nationally outlining the principles, practices, communication process, adoption and diffusion of agricultural production practices and extension methods and to enable students to identify, analyse and apply appropriate extension methodologies in extension and rural development</p>		
<b>Content</b>	<ul style="list-style-type: none"> <li>• History and philosophy of agricultural extension</li> <li>• Communication process as a basis for extension</li> <li>• Adoption and diffusion model</li> <li>• Participation of Farmers in Extension Programmes</li> <li>• Self-reliant Participatory Development</li> <li>• Agents of Change</li> <li>• Alternative approaches to Organizing Extension</li> <li>• Using Rapid or Participatory Rural Appraisal</li> <li>• Participatory Methodologies ( PRA, RAAKS, RRA)</li> </ul>		
<b>Outcomes</b>	<p>After completing this course students will be able to:</p> <ul style="list-style-type: none"> <li>▪ Define and describe basic concepts in extension and rural development;</li> <li>▪ Explain how agricultural extension developed globally and nationally with reference to South Africa;</li> <li>▪ Discuss the philosophy and patterns of extension world-wide and in Southern Africa;</li> <li>▪ Discuss principles and practice communication process as the basis of extension;</li> <li>▪ Explain the educational processes achieved through the adoption diffusion model;</li> <li>▪ Understand and describe how the different participatory extension methods can be applied to real life situations;</li> </ul>		



	<ul style="list-style-type: none"> <li>Assess needs, constraints of farmers and possible solutions to problems using different participatory methodologies</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark
<b>Assessment Criteria</b>	Students will be tested not only on knowledge and insight into extension and rural development concepts but also on their ability to apply this to case studies and real life situations
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical's

<b>Title</b>	<b>Extension methods</b>	
<b>Code</b>	<b>4AAE222</b>	<b>Department: Agriculture</b>
<b>Prerequisites</b>	None	Co-requisites : None
<b>Aim</b>	This course is designed to introduce students to farming systems and project management in Extension and Rural Development. The course provides an overview of the fundamentals of project management, planning, implementation and facilitation.	
<b>Content</b>	<ul style="list-style-type: none"> <li>The evolution of farming systems</li> <li>Planning and management of farming systems</li> <li>Applications of Strategic Management in Public Institutions</li> <li>Management of Change: Theory and Application</li> <li>Project Management: The Process</li> <li>Application of Project management for Strategic Change</li> <li>Project Management for Community Development Projects</li> <li>Community participation</li> <li>The Roles and Functions of Public Project Managers</li> </ul>	
<b>Outcomes</b>	After completing this module students will be able to: <ul style="list-style-type: none"> <li>Understand farming systems in the context of development;</li> <li>be familiar with key terms in project management;</li> <li>Understand the strategic management process;</li> <li>examine management of change in theory and practice</li> <li>understand the process of project management;</li> <li>apply project management for strategic change;</li> <li>examine the role of project management in community development projects;</li> <li>understand the functions of public project managers</li> </ul>	
<b>Assessment</b>	40% Continuous Assessment Mark 60% Final Exam Mark	
<b>Assessment Criteria</b>	Students will be assessed on: Understanding of farming systems and development Application of theoretical aspects of project management	
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical's	

## Department of Biochemistry and Microbiology

### **STAFF**

Professor and HOD  
Associate Professor

AK Basson, MSc (PU for CHE), DSc (Microbiology) (UNIZULU)  
E Madoroba, PhD (Microbiology) (UP)

Lecturers

K Syed, PhD (Biochemistry) (Sri Krishnadevaraya Univ. India)  
MS Mthembu, BSc Hons, MSc (UNIZULU) PhD (DUT)  
PGDipHE (UKZN) ULDP (USB), RS (Rhodes)  
J Shandu, BSc Hons, MSc (UNIZULU)  
ML Ngwenya, BSc Hons, Dip (Public Admin), MSc (UNIZULU)  
Hlengwa N, BSc Hons (Microbiology), MSc, PhD (Biochemistry)  
UNIZULU) (part time lecturer)

Senior Laboratory  
Assistants

ZG Ntombela, MSc (Microbiology) (UNIZULU)  
TG Dube, BSc (Hydrology & Microbiology) (UNIZULU)  
SF Ndulini, BSc Hons, MSc (Microbiology) (UNIZULU) (part time)  
RD Mthembu  
MLC Mkhwanazi

Laboratory Assistants

### BIOCHEMISTRY

Title	Biomolecules and Enzymology		
Code	4BCH211	Department	Biochemistry & Microbiology
Prerequisites	4CHM121, 4CHM122	Co-requisites	None
Aim	This module aims to acquaint students with the structural chemistry of the components of living matter and the relationship of biological function to chemical structure.		
Content	<ul style="list-style-type: none"> <li>• Introduction to water</li> <li>• Water as solvent in living systems; solubility criteria; acids, bases, pH and buffer action; ionic strength. Quantitative analytical concepts in Biochemistry.</li> <li>• Biomolecules</li> <li>• Physical, chemical and biological properties of carbohydrates, lipids, proteins, nucleic acids. Micro-components (vitamins, minerals) in living systems</li> <li>• Enzymes</li> <li>• General nature of enzymes; nomenclature and classification; theory of catalysis; nature of active sites; cofactors and coenzymes; kinetics of enzyme reactions; inhibition of enzymes; isoenzymes; immobilized enzymes; non-protein enzymes; enzyme assay.</li> </ul>		
Assessment	40% Continuous Assessment Mark (20% practical assessment; 20% tests and assignments 60% Formal end of module exam (3 hours)		
DP Requirement	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>Metabolism</b>		
<b>Code</b>	<b>4BCH212</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4CHM121, 4CHM122	Co-requisites	None
<b>Aim</b>	To gain knowledge on different metabolic pathways involving the catabolism and anabolism of different biomolecules		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Intermediary Metabolism: <ul style="list-style-type: none"> <li>◦ Introduction to metabolism; Catabolism and anabolism</li> </ul> </li> <li>• Energy Metabolism: <ul style="list-style-type: none"> <li>◦ Free energy change; High energy biomolecules</li> </ul> </li> <li>• Carbohydrate Metabolism: <ul style="list-style-type: none"> <li>◦ Digestion and absorption; Glycolysis; Pentose phosphate pathway;</li> </ul> </li> <li>• Glycogenesis; Control of carbohydrate metabolism <ul style="list-style-type: none"> <li>◦ The TCA Cycle:</li> </ul> </li> <li>• TCA cycle reactions; Amphibolic nature of the TCA cycle; <ul style="list-style-type: none"> <li>◦ Control of the TCA cycle; Glyoxalate cycle</li> </ul> </li> <li>• Lipid Metabolism: <ul style="list-style-type: none"> <li>◦ Introduction of lipid digestion and absorption; <math>\beta</math>-oxidation;</li> </ul> </li> <li>• Ketone bodies metabolism; Fatty acid synthesis; Control of lipid metabolism <ul style="list-style-type: none"> <li>◦ The Electron Transport Chain and Oxidative Phosphorylation:</li> </ul> </li> <li>• Enzymatic shuttles <ul style="list-style-type: none"> <li>◦ Protein Metabolism:</li> </ul> </li> <li>• Digestion and absorption of lipids; Amino acid catabolism; Urea cycle</li> </ul>		
<b>Outcomes</b>	On completion of the module the students will be able to have a thorough understanding of: <ul style="list-style-type: none"> <li>▪ The overview of metabolism</li> <li>▪ Digestion and absorption of different biomolecules</li> <li>▪ Different metabolic pathways – in relation to the synthesis and breakdown of different biomolecules</li> <li>▪ Control of metabolism of different biomolecules</li> </ul>		
<b>Assessment</b>	40% Continuous assessment mark (20% practical assessment; 20% tests and assignment) 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>Biochemistry: Principles and Techniques</b>		
<b>Code</b>	<b>4BCH222</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4CHM121 4CHM122	Co-requisites	None

<b>Aim</b>	The aim of this module is to make students understand the biochemical principles in association with microbial principles.
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction and terminology used in practical biochemistry.</li> <li>• General principles of biochemical investigations</li> <li>• Molecular biology and basic techniques</li> <li>• Immunochemical techniques/assays</li> <li>• Centrifugation techniques</li> <li>• Protein structure, purification and characterization</li> <li>• Spectroscopic techniques</li> <li>• Electrophoretic techniques</li> <li>• Chromatographic techniques</li> <li>• Radioisotope techniques</li> <li>• Electrochemical techniques</li> </ul>
<b>Assessment</b>	40% Continuous Assessment. 60% Summative Assessment comprising of 3 hour written examination
<b>DP Requirements</b>	40% Continuous Assessment Mark. 80% practical attendance and field work

<b>Title</b>	<b>Gene Expression and Replication</b>		
<b>Code</b>	<b>4BCH311</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4BCH212	Co-requisites	None
<b>Aim</b>	This course/module is intended to equip the learner with the basic understanding of DNA and RNA chemistry. Understanding of gene expression and replication		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Chemical structure of nucleic acids</li> <li>• DNA and RNA replication</li> <li>• Enzymes and their role in DNA and RNA replication</li> <li>• Transcription</li> <li>• Translation</li> <li>• Enzymes and their role in transcription and translation.</li> <li>• Regulation of gene expression</li> <li>• DNA repair systems</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment (comprising 10% assignments plus 30% theory assessments) 60% Summative Assessment comprising of 3 hour written examination		
<b>DP Requirements</b>	40% Continuous Assessment Mark, 80% Attendance at practical's		

<b>Title</b>	<b>Metabolic Regulation</b>		
<b>Code</b>	<b>4BCH321</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4BCH212	Co-requisites	None
<b>Aim</b>	The aim of this module is to provide students with comprehensive knowledge of the current concepts and theories of the regulation of metabolic processes.		

<b>Content</b>	<ul style="list-style-type: none"> <li>Metabolic map. Catabolic and anabolic pathways. Regulation of metabolism. Key enzymes and metabolites. Hormones and neurotransmitters as signals.</li> <li>Signal transduction by intracellular receptors and by cell-surface receptors.</li> <li>Concept of the "second messenger" molecules. Intracellular messenger systems (adenylate cyclase system, calcium/phosphatidylinositol system, calmodulin, nitric oxide)</li> <li>Regulation of glycolysis, gluconeogenesis, glycogen degradation/synthesis.</li> <li>Regulation of Citric Acid Cycle. Inhibitors and activators of the cycle.</li> <li>Regulation of Fatty Acid degradation and synthesis. Synthesis of ketone bodies</li> <li>Regulation of Amino Acid degradation. Transamination and oxidative deamination. Ketogenic and glucogenic amino acids. Urea cycle.</li> <li>Integration of metabolism. Metabolic effects of insulin and glucagon</li> <li>Metabolic regulation in well-fed state and starvation.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments; 20% Tests and Assignments) 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical and fieldwork

<b>Title</b>	<b>Recombinant DNA Technology</b>		
<b>Code</b>	<b>4BCH312</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4BCH211	<b>Co-requisites</b>	None
<b>Aim</b>	The aim of this module is to make students to understand the basics of genetic manipulation.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Basic problems in recombinant DNA technology.</li> <li>Basic techniques and procedures in recombinant DNA technology.</li> <li>Methods used in transformation of microorganisms.</li> <li>Enzymes and their usefulness in the transformation of microorganisms.</li> <li>Cloning by homopolymer tailing and cloning cDNA.</li> <li>Cloning vectors and their properties.</li> <li>Plasmid construction and characterization of new cloning vectors.</li> <li>Cloning strategies in gram-negative organisms.</li> <li>Cloning and gene expression in yeast cells.</li> <li>In vitro DNA packaging.</li> <li>DNA walking and DNA sequencing</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment.		

	60% Summative Assessment comprising of 3 hour written examination.
DP Requirements	40% Continuous Assessment Mark. 80% practical attendance and field work

<b>Title</b>	<b>Biochemistry of Nutrition</b>		
<b>Code</b>	<b>4BCH322</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4BCH211 4BCH212	Co-requisites	None
<b>Aim</b>	The goal of this module is to provide students with comprehensive knowledge of food, nutrition & health.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• The energy value of food; the biological value of food; RDA,</li> <li>• Human nutritional requirements—</li> <li>• Macronutrients—proteins, lipids, carbohydrates</li> <li>• Micronutrients—vitamins, minerals</li> <li>• Minerals metabolism</li> <li>• Water-soluble &amp; fat soluble vitamins</li> <li>• Dietary fiber, alternative sweeteners</li> <li>• Anti-nutrients</li> <li>• Malnutrition (dietary excesses &amp; deficiencies)—obesity, kwashiorkor, marasmus, starvation, diabetes.</li> <li>• Formulated/crash/optimal diets</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessment; 20% tests and assignments) 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

### MICROBIOLOGY

<b>Title</b>	<b>Prokaryotes Classification and Microbial techniques</b>		
<b>Code</b>	<b>4MCB211</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4CHM121, 4CHM122	Co-requisites	None
<b>Aim</b>	This module is designed to introduce the student to microbial techniques and to apply it in the identification and classification of prokaryotes.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction to microscopes.</li> <li>• Stains and staining techniques.</li> <li>• Aseptic techniques to transfer bacteria.</li> <li>• Microscopic examination of wet mounts.</li> <li>• Basic apparatus and glassware for a Microbiology laboratory.</li> <li>• Culture media preparation and sterilization.</li> <li>• Chemical defined- and complex media.</li> <li>• Selective, differential and enriched media.</li> <li>• Pure culture techniques.</li> </ul>		

	<ul style="list-style-type: none"> <li>Anaerobic culture methods.</li> <li>Colony morphology.</li> <li>Biochemical activities of bacteria.</li> <li>Introduction to Microbial classification.</li> <li>Case studies.</li> </ul>
<b>Assessment</b>	Continuous assessment mark 20% Practical assessment mark 20% Formal exam (3Hours) 60%
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork

<b>Title:</b>	<b>Prokaryotes Structure and Environmental Microbiology.</b>		
<b>Code</b>	<b>4MCB221</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4CHM112	Co-requisites	None
<b>Aim</b>	The aim of the module is to provide students with comprehensive knowledge of the structure of prokaryotes and their influence on the environment.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Overview of the prokaryotic cell structure.</li> <li>The plasma membrane.</li> <li>The cytoplasmic matrix.</li> <li>The nucleoid.</li> <li>Plasmids.</li> <li>Flagella, pili and fimbriae.</li> <li>Bacterial cell wall.</li> <li>Archaeal cell walls.</li> <li>Protein secretion in prokaryotes.</li> <li>Components external to the cell wall.</li> <li>Chemotaxis.</li> <li>Bacterial endospores.</li> <li>Biogeochemical cycling and introductory microbial ecology.</li> <li>Microorganisms in marine and fresh water environments.</li> <li>Microorganisms in terrestrial environments.</li> <li>Microbial interactions.</li> </ul>		
<b>Assessment</b>	Continuous assessment mark 20% Practical assessments 20% Formal end of module exam (3Hours) 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>Microbial Growth and Medical Microbiology</b>		
<b>Code</b>	<b>4MCB212</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4CHM121 4CHM122	Co-requisites	None
<b>Aim</b>	This module is designed to give students a better understanding of microorganisms and their role in the field of clinical microbiology.		

<b>Content</b>	<ul style="list-style-type: none"> <li>Collection, handling and transportation of specimens.</li> <li>Identification of microorganisms. Microscopy, growth,</li> <li>biochemical characteristics and rapid methods of identification, immunologic techniques, bacteriophage typing &amp; molecular methods and analysis of metabolic products. Susceptibility testing.</li> <li>Computers in clinical microbiology.</li> <li>The bacterial growth curve. Measurement of bacterial growth.</li> <li>Continuous culture of microorganisms</li> <li>The influence of environmental factors on microbial growth.</li> <li>Microbial growth in natural environments.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment (comprising 20% practical, 20% assignments and tests) 60% Formal end of module exam (3 hours).
<b>DP Requirements</b>	40% Continuous Assessment Mark, 80% Attendance at practical's

<b>Title</b>	<b>Food Microbiology and Food Analysis</b>		
<b>Code</b>	<b>4MCB311</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4MCB211	Co-requisites	None
<b>Aim</b>	This module is designed to provide students with a better understanding of the microorganisms associated with foods, their effects on foods, mode of transmission of pathogens via foods and their usage in food production.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Food analysis and food preservation <ul style="list-style-type: none"> <li>Analysis of chemical composition of various foods. Preservatives.</li> <li>Microbial growth in foods</li> <li>Microbial growth and food spoilage. Methods of controlling food spoilage.</li> </ul> </li> <li>Food borne diseases <ul style="list-style-type: none"> <li>Detection of food borne pathogens</li> </ul> </li> <li>Microbiology of fermented foods <ul style="list-style-type: none"> <li>Microorganisms as foods and food amendments</li> </ul> </li> </ul>		
<b>Assessment</b>	40% Continuous Assessment (comprising 20% practical, 20% assignments and tests) 60% Formal end of module exam (3 hours).		
<b>DP Requirements</b>	40% Continuous Assessment Mark, 80% Attendance at practical's		

<b>Title</b>	<b>Environmental Influences on Microorganisms &amp; Principles of Industrial Microbiology</b>		
<b>Code</b>	<b>4MCB312</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4MCB212	Co-requisites	None
<b>Aim</b>	This module is intended to equip the learners with the understanding of the role and the influence of nutrition and the environment on		



	microorganisms as well as applying the principles of microbial biotechnology in industries.
<b>Content</b>	<ul style="list-style-type: none"> <li>• Microbial nutrition and culture media.</li> <li>• Catalysis, enzymes and oxidation reduction reaction.</li> <li>• High energy compounds and energy conservation.</li> <li>• Fermentation</li> <li>• Respiration and electron transport chain and energy conservation.</li> <li>• Carbon flow: Citric acid cycle - Citric acid and other organic compound production</li> <li>• The balance sheet aerobic respiration and energy storage.</li> <li>• Biosynthesis of monomers.</li> <li>• Growth and product formation in biocatalysis.</li> <li>• Characteristics of large scale fermentations and fermentation scale-up.</li> <li>• Vitamins and amino acid production from fermentation.</li> <li>• Alcohol and alcoholic beverages.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment (comprising 20% practical assessment plus 20% theory assessments) 60% Formal end of module exam (3 hours).
<b>DP Requirements</b>	40% Continuous Assessment Mark, 80% Attendance at practical's

<b>Title</b>	<b>Biotechnology</b>		
<b>Code</b>	<b>4MCB322</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4MCB212	Co-requisites	None
<b>Aim</b>	This course/module is intended to equip the learner with the basic understanding of biotechnology and allow the student to progress to more advanced experiments.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Definition: Overview and Brief History of Biotechnology</li> <li>• Applications of biotechnology in different disciplines</li> <li>• Three-Component Central Core: Material, Process and Products</li> <li>• Tools for Biotechnology: Microbes, Plants and Animals</li> <li>• Processes – Fermentation</li> <li>• Bioprocess technology Bioprocess technology</li> <li>• Genetics</li> <li>• Downstream process – Product purification and Marketing</li> <li>• Regulation, Social, ethical and safety Impact of Biotechnology</li> <li>• Patent</li> <li>• Final Review and Future Development of Biotechnology</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment (comprising 20% practical assessment plus 20% theory assessments) 60% Summative Assessment (comprising 3 hour practical (20%) and 3 hour theory exam (40%)).		
<b>DP Requirements</b>	40% Continuous Assessment Mark, 80% Attendance at practical's		

<b>Title</b>	<b>Epidemiology and Pathogenesis of Infectious Disease.</b>		
<b>Code</b>	<b>4MCB311</b>	<b>Department</b>	<b>Biochemistry &amp; Microbiology</b>
<b>Prerequisites</b>	4MCB212	Co-requisites	None
<b>Aim</b>	The aim of this module is to make students understand disease origin and progression.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Epidemiology and public health and Science of epidemiology</li> <li>• Epidemiology of HIV/AIDS and transmission of diseases</li> <li>• Disease reservoirs and nosocomial infections.</li> <li>• Emerging and re-emerging diseases.</li> <li>• Epidemiology of airborne diseases.</li> <li>• Epidemiology of waterborne diseases.</li> <li>• Epidemiology of sexual transmitted diseases.</li> <li>• Epidemiology of food borne diseases.</li> <li>• Food poisoning and food infection.</li> </ul>		
<b>Outcomes</b>	After studying this module, a learner should be able to: <ul style="list-style-type: none"> <li>▪ Define and understand the science of epidemiology.</li> <li>▪ Describe infectious diseases, their origin and their spread.</li> <li>▪ Methods and effective ways of curbing epidemics.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment (2 tests + 1 assignment). 60% Summative Assessment comprising of 3 hour written examination		
<b>Assessment Criteria</b>	Individual skill in writing is critical. The learner should be able to critically analyze and apply the module's outcomes to relevant case studies The ability to orally present a given epidemiology topic is required.		
<b>DP Requirements</b>	30% Continuous Assessment Mark. 80% practical attendance and field work.		

**STAFF**

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<b>Title</b>			
<b>Introduction to Plant Cytology, Genetics and Physiology</b>			
<b>Code</b>	<b>4BOT111</b>	<b>Department</b>	<b>Botany</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	The learner will study plant metabolism, heredity and cytology. This will include understanding theoretical knowledge and developing the skills to solve genetics problems through microscopic techniques.		
<b>Content</b>	Aspects to be studied will include: <ul style="list-style-type: none"> <li>the chemistry of plants</li> <li>essential elements</li> <li>carbohydrates, lipids, proteins, nucleic acids</li> <li>the plant cell structure and function</li> <li>plant cell division</li> <li>chemical energy and chemical reactions, enzymes and energy carriers in plants</li> <li>the movement of water and solutes in plants</li> <li>photosynthesis, transpiration, respiration and the conditions affecting it</li> <li>Mendelian genetics</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments; 10% Interim test; 10% Assignment) 60% Formal end of module theory (3 hours) and practical exams		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

<b>Title</b>			
<b>Plant morphology, taxonomy and an introduction to Mycology</b>			
<b>Code</b>	<b>4BOT112</b>	<b>Department</b>	<b>Botany</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	The learner will study external structure of angiosperms, reproductive system, characteristics and economic importance of fungi. This will include understanding theoretical knowledge and developing the skills to solve mycology problems through microscopic techniques.		
<b>Content</b>	Aspects to be studied will include:		

	<ul style="list-style-type: none"> <li>• types of root systems, origin of roots and root modification</li> <li>• different forms of stems</li> <li>• external structure of monocotyledon and dicotyledon leaf</li> <li>• leaf modifications and inflorescences</li> <li>• floral morphology, floral diagrams and floral formulae</li> <li>• pollination, seed and fruit formation</li> <li>• classification, characteristics, reproduction and economic importance of fungi and lichens</li> <li>• life cycles of fungi and their role in the environment</li> <li>• effects of fungi on plants and on human health</li> <li>• microscopic structure of fungi and lichens</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments; 10% Interim test; 10% Assignment) 60% Formal end of module theory (3 hours) and practical exams
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork

<b>Title</b>	<b>Plant Growth and Development and Floral Propagation</b>		
<b>Code</b>	<b>4BOT211</b>	<b>Department</b>	<b>Botany</b>
<b>Prerequisites</b>	4BOT111 and 4BOT112	Co-requisites	
<b>Aim</b>	This course is designed to develop an understanding of the role played by plant hormones on growth and development including plant responses to various stimuli. To understand the principles and factors involved in floral propagation.		
<b>Content</b>	Aspects to be studied will include: <ul style="list-style-type: none"> <li>• phytochrome, stomatal movements,</li> <li>• photophysiology, abscisic acid, auxins, gibberellins, cytokinins, kinetin and ethylene on plant growth and development.</li> <li>• Phototropic responses and general aspects of seed and vegetative propagation.</li> <li>• It includes techniques to study the effects of the above mentioned hormones on plant growth and development, and also phototropic responses on plants.</li> <li>• To develop skills regarding the effect of external factors on the propagation of flowering plants and to identify and break dormancy in seeds.</li> </ul>		
<b>Assessment</b>	40% Continuous assessment mark 60% Summative assessment (comprising 3 hour practical and theory exam)		
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>Plant Anatomy, Taxonomy and Biodiversity</b>		
<b>Code</b>	<b>4BOT212</b>	<b>Department</b>	<b>Botany</b>

<b>Prerequisites</b>	4BOT111 and 4BOT112	<b>Co-requisites</b>	
<b>Aim</b>	The purpose of this course is to acquire knowledge of the internal structure of roots, stems and leaves of monocot and dicot plants. To use keys to identify selected plant families and to gain knowledge of the diversity of plant communities.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Simple and complex plant tissues: structure and function of xylem, phloem, secretory cells and tissues, epidermis.</li> <li>Primary and secondary body of the plant.</li> <li>Anomalous secondary growth. Microscopic techniques for identification of monocot and dicot roots, stems and leaves.</li> <li>To study the diversity of plant communities:</li> <li>Global, national and local factors that affect plant biodiversity.</li> <li>Identification of Pteridophyta, Gymnospermae and Angiospermae.</li> <li>Herbarium usage, diagnostic characteristics of important plant families.</li> </ul>		
<b>Assessment</b>	40% Continuous assessment mark 60% Summative assessment (comprising 3 hour practical and theory exam)		
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>Cytology, Genetics and Plant Biochemistry</b>		
<b>Code</b>	<b>4BOT311</b>	<b>Department</b>	<b>Botany</b>
<b>Prerequisites</b>	4BOT111, 4BOT112, 4BOT211, 4BOT212	<b>Co-requisites</b>	
<b>Aim</b>	This course is designed to develop an understanding about the mechanism of inheritance, phenolics, isoprenoids, nitrogen metabolism, biochemical plant pathology, biochemical plant ecology and plant cell biotechnology.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Cytological and molecular structures of importance to genetics and the genetic code.</li> <li>Mendelian genetics.</li> <li>Multiple alleles probability.</li> <li>Sex determination and sex-linked inheritance.</li> <li>Linkage, crossing-over and chromosome mapping.</li> <li>Genetic fine structure.</li> <li>Pleiotrophy, polyploidy.</li> <li>Various cytological staining procedures and solving genetic problems.</li> <li>Structures, functions and metabolic pathways of major classes of phenolics in plants, isoprenoid metabolism, special nitrogen metabolism, and biochemical plant pathology and biochemical plant ecology.</li> <li>Different techniques involved in chromatography.</li> </ul>		
<b>Assessment</b>	40% Continuous assessment mark		

	60% Summative assessment (comprising 3 hour practical and theory exam)
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance at practical's and fieldwork

<b>Title</b>	<b>Aquatic Botany and Lower Plant Taxonomy</b>		
<b>Code</b>	<b>4BOT321</b>	<b>Department</b>	<b>Botany</b>
<b>Prerequisites</b>	4BOT111; 4BOT112, 4BOT211, 4BOT212	Co-requisites	
<b>Aim</b>	This course is designed to enhance the knowledge of the learners on the ecology, physiology and taxonomy of aquatic and lower plants in relation to their environment.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Types of water bodies: lakes, rivers and marine.</li> <li>• Lake formation, typology and class.</li> <li>• Environmental factors.</li> <li>• Major nutrients.</li> <li>• Phytoplankton communities, periphyton and macrophyton production and limiting factors.</li> <li>• Pollution indicators.</li> <li>• Plant zonation.</li> <li>• Detritus.</li> <li>• Limnology of shallow and deep lakes.</li> <li>• Sampling and preparation of phytoplankton for laboratory analysis.</li> <li>• Measurement of environmental factors and nutrients.</li> <li>• Structure, life cycles, ecology and taxonomy of Algae, Bryophyta and Pteridophyta.</li> </ul>		
<b>Assessment</b>	40% Continuous assessment mark 60% Summative assessment (comprising 3 hour practical and theory exam)		
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>People and Plants</b>		
<b>Code</b>	<b>4BOT312</b>	<b>Department</b>	<b>Botany</b>
<b>Prerequisites</b>	4BOT111, 4BOT112, 4BOT211, 4BOT212	Co-requisites	
<b>Aim</b>	To examine the intimate linkage between people and the plant kingdom by studying various aspects of plant-uses, including plants used for medicinal and cultural purposes.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Concepts related to ethnobotany and ethnobotany data; methods to record and process this information.</li> <li>• Ethnobotanical research and community development.</li> <li>• History, characteristics and economic uses of ethnobotanical important plants.</li> </ul>		

	<ul style="list-style-type: none"> <li>• Importance of medicinal plants; cultural aspects of healing; plant parts used for healing.</li> <li>• Methods of collecting and storage for marketing and for phytochemical analysis; dosage forms, methods of preparation and administration; active ingredients.</li> <li>• The ethics of searching for new plant products; medicinally important plants species in KwaZulu-Natal.</li> </ul>
<b>Assessment</b>	40% Continuous assessment mark 60% Summative assessment (comprising 3 hour practical and theory exam)
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance at practical's and fieldwork

<b>Title</b>	<b>Plant Conservation and Management and Terrestrial Ecology</b>		
<b>Code</b>	<b>4BOT322</b>	<b>Department</b>	<b>Botany</b>
<b>Prerequisites</b>	4BOT111; 4BOT112, 4BOT211, 4BOT212	Co-requisites	
<b>Aim</b>	This course is designed to develop an understanding of the principles of environmental management and its role in nature conservation and to study the plants in their environment.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• A sustainable relationship with plants.</li> <li>• Environmental management.</li> <li>• Resource economics, renewable and non-renewable resources.</li> <li>• Environmental deterioration; ethics of environmental conservation.</li> <li>• Legislation on nature conservation.</li> <li>• Biodiversity: mountains, protected areas, coastal and marine.</li> <li>• Rehabilitating plant communities.</li> <li>• Plant ecology; the ecological unit; the environmental complex.</li> <li>• Population structure and plant demography.</li> <li>• Resource allocation.</li> <li>• Species interactions.</li> <li>• Classification and ordination of communities.</li> <li>• Plant succession.</li> <li>• Productivity; mineral cycles; environmental factors.</li> <li>• Plant adaptations.</li> <li>• Methods of sampling. Methods of documenting succession, measuring productivity and radiation.</li> <li>• Physical properties of soil monitoring environmental factors.</li> </ul>		
<b>Assessment</b>	40% Continuous assessment mark 60% Summative assessment (comprising 3 hour practical and theory exam)		
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance at practical's and fieldwork		

## Department of Chemistry

### **STAFF**

Senior Professor & SARChI Chair	N Revaprasadu, BScHons (Natal), PhD (London), Dip (Imperial College)
Professor	TE Motaung, BSc (UNIN) (FS) PhD (UFS)
Associate Professor	VSR Pullabhotla, BScHons (Andhra University-India), MSc (Eng) (JNT University, India), PhD (UKZN)
	T Govender, PhD (Chemistry) (UKZN) (part time lecturer)
Senior Lecturers	TV Segapelo, BScHons, MSc (UWC), PhD (UJ)
Lecturer	SE Mavundla, PhD (UWC)
Senior Laboratory Assistants	NM Sibiyi, ND (Cape Tech), BScHons (UNISA)
Laboratory Technologist	NL Khumalo, BScHons (WITS)
Lab Assistant	PW Zibane, BScHons (UNIZULU), SZ Ncanana, BSc Hons, MSc (Chemistry) (UNIZULU)
Laboratory Helpers	N Ntshangase SZ Mkhwanazi, BAdmin (UNIZULU)

<b>Title</b>	<b>General Chemistry 111</b>		
<b>Code</b>	<b>4CHM111</b>	<b>Department</b>	<b>Chemistry</b>
<b>Prerequisites</b>	None	Co-requisites	4MTH111, 4PHY111 or 4PHY121
<b>Aim</b>	The aim of this module is to give learners the necessary grounding in chemistry for further studies in analytical, inorganic, organic and physical chemistry		
<b>Content</b>	The nature of matter. Atomic structure and periodicity. Electron configurations and bonding. Types of chemical reactions. Chemical equations and the mole concept. The solid, liquid and gaseous states. Solutions. Thermochemistry. Chemical equilibrium. Chemical Kinetics. Redox equations and basic electrochemistry. Acids, bases and salts. Theory of acid-base titrations, including pH. Basic laboratory skills, including weighing and volume measurements and gravimetric, volumetric, and qualitative analyses		
<b>Outcome</b>	Learners must be able to demonstrate: <ul style="list-style-type: none"> <li>▪ an understanding of the structure of the atom, the chemical bonding which occurs between atoms and the types of chemical reactions that occur.</li> <li>▪ an ability to write chemical formulas, balance equations, and apply the mole concepts in chemical calculations to mass reactions and reactions in solution.</li> <li>▪ an understanding of the classification of matter and the fundamental properties of matter in the solid, liquid and gaseous phases and of solutions.</li> <li>▪ a thorough grasp of the basic principles of thermochemistry, chemical equilibrium, chemical kinetics, basic electrochemistry and the characteristics of acids, bases and salts as well as the application of this knowledge to acid base titrations.</li> </ul>		



	<ul style="list-style-type: none"> <li>an ability to perform a range of basic laboratory skills, including weighing and volume measurements and simple gravimetric, volumetric, and qualitative analyses</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (comprising 20% practical assessments plus 20% Interim assessments.) 60% Summative assessment (comprising a 3 hour assessment after the course work has been completed)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>General Chemistry 112</b>		
<b>Code</b>	<b>4CHM112</b>	<b>Department</b>	<b>Chemistry</b>
<b>Prerequisites</b>	Students must have attended and written the assessments for 4CHM111.	Co-requisites	4MTH112, 4PHY112 or 4PHY122
<b>Aim</b>	To provide an introduction to the basic concepts, terminology, laws and principles that determines the properties and behaviour of organic and inorganic compounds.		
<b>Content</b>	Periodicity exemplified by the physical and chemical behaviours of elements in Periods 2 and 3, Groups 1, 2, 4 and first row transition metals. Introduction to coordination chemistry and free energy approach to extraction of metals. Isolation and purification of organic compounds. General properties and structure of organic compounds. The hydrocarbons – nomenclature, properties, preparations, and reactions. Introduction to functional group chemistry. Laboratory work including volumetric, gravimetric and qualitative analyses. Determination of purity of organic compounds. Functional group analyses and some basic reactions of organic compounds.		
<b>Outcomes</b>	Learners must be able to demonstrate: <ul style="list-style-type: none"> <li>an understanding of periodicity and the physical and chemical behaviour of elements in Periods 2 and 3 of Groups 1, 2, 4 and first row transition metals.</li> <li>a grasp of the basic principles of coordination chemistry and the free energy approach to extraction of metals.</li> <li>a sound knowledge of the nomenclature, properties, preparations, and reactions of the hydrocarbons and of the basics of functional group chemistry.</li> <li>an ability to perform laboratory work including volumetric, gravimetric and qualitative analyses as well as the determination of purity of organic compounds.</li> <li>an ability to perform functional group analyses and some of the basic reactions of organic compounds.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (Comprising 20% practical assessments plus 20% Interim assessments.) 60% Summative assessment (comprising a 3 hour assessment after the course work has been completed)		

<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's
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<b>Title</b>	<b>Basic Chemistry 121</b>		
<b>Code</b>	<b>4CHM121</b>	<b>Department</b>	<b>Chemistry</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	The aim of this module is to provide learners with a basic grounding in chemistry in order to provide an insight into chemical aspects of non-chemistry majors.		
<b>Content</b>	The nature of matter. Atoms, elements and compounds. Electronic structure and bonding. Types of chemical reactions. Balancing chemical equations and the mole. The three phases of matter and the gas laws. Properties of solutions. Energy changes in chemical reactions. Chemical equilibria and kinetics. Electrochemical cell and electrolysis. Acids, Bases and Salts.		
<b>Outcomes</b>	Learners must be able to demonstrate: <ul style="list-style-type: none"> <li>a basic understanding of the structure of the atom, the chemical bonding which occurs between atoms and the types of chemical reactions that occur.</li> <li>a basic ability to write chemical formulas, balance equations, and apply the mole concepts in chemical calculations to mass reactions and reactions in solution.</li> <li>a basic understanding of the classification of matter and the fundamental properties of matter in the solid, liquid and gaseous phases and of solutions.</li> <li>a basic grasp of the basic principles of chemical equilibrium, chemical kinetics, electrochemistry and the characteristics of acids, bases and salts as well as the application of this knowledge to acid base titrations.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Summative Assessment		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at tutorials		

Title	Basic Chemistry 122	
Code	4CHM122	Department: Chemistry
Prerequisites	Students must have attended and written the assessments for 4CHM121.	Co-requisites: None
Aim	The aim of this module is to provide learners with an insight into basic descriptive chemistry of elements, introductory organic chemistry, and some applications for non-chemistry majors.	
Content	The chemical and physical properties of Periods II and III. The chemical and physical properties of the s and p blocks. Transition metal chemistry. Saturated, unsaturated and aromatic hydrocarbons. The geometry of organic molecules and isomerism. Basic types of organic reactions.	

<b>Outcomes</b>	Learners must be able to demonstrate: <ul style="list-style-type: none"> <li>a basic understanding of the physical and chemical behavior of elements in s and p blocks and transition metals.</li> <li>a basic knowledge of the nomenclature, properties, preparations, and reactions of the saturated, unsaturated and aromatic hydrocarbons and the basics of functional group chemistry.</li> <li>an ability to explain the geometry of organic molecules and isomerism and discuss the basic types of organic reactions.</li> <li>Acquire basic manipulative skills in both qualitative and quantitative analyses of materials</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Summative Assessment
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at tutorials

<b>Title</b>	<b>Chemistry for Consumer Science</b>	
<b>Code</b>	<b>4CHM132</b>	<b>Department: Chemistry</b>
<b>Prerequisites</b>	None	Co-requisites: None
<b>Aim</b>	The aim of this module is to provide learners with a grounding in chemistry that is sufficient to enable them to grasp the various chemical aspects textiles, food preparation and nutrition.	
<b>Content</b>	The Structure of Matter: including elements, compounds, atoms, molecules, atomic structure and electron configuration. and properties. The Periodic Table, periodic properties and trends, metals, non-metals. The nature of chemical bonding and the various types of bonding. Chemical formulas and names of some common household products. Phases of matter, solutions, colloids and emulsions Type of chemical reactions, energy changes in chemical reactions and the factors affecting the rate of chemical reactions and equilibria. Organic Chemistry: Functional groups and their characteristics. Polymerisation reactions and macromolecules. Proteins, carbohydrates, fats, soaps, detergents, hard and soft water and assorted aspects of kitchen chemistry.	
<b>Outcomes</b>	Learners must be able to demonstrate: <ul style="list-style-type: none"> <li>a basic understanding of the physical and chemical behavior of matter and its transformations in chemical reactions</li> <li>a knowledge of the basic principles of organic chemistry with an emphasis on macromolecules and polymers that are relevant to nutrition and other aspects of consumer science.</li> </ul>	
<b>Assessment</b>	40% Continuous Assessment Mark 60% Summative Assessment	
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at tutorials	

<b>Analytical &amp; Inorganic Chemistry 2</b>			
<b>Title</b>	<b>Code</b>	<b>Department</b>	<b>Chemistry</b>
<b>Prerequisites</b>	(1) 4CHM111 (2) 4CHM112 (3) 4MTH111 or 4MTH112 (4) Any <b>one</b> of the following: 4PHY111, 4PHY112, 4PHY121 or 4PHY122	Co-requisites	None
<b>Aim</b>	This module is designed to introduce learners to basic concepts and practical skills in Analytical chemistry and to build on the foundation laid on the chemistry of the elements at the first year using the concepts of periodicity in the treatment of chemistry of p-block and first row transition metal chemistry, and to introduce students to co-ordination chemistry.		
<b>Content</b>	<p>Section A: Analytical Chemistry: Basic calculations in analytical chemistry; Errors in chemical analysis; Aqueous solutions and Chemical equilibria; Effect of electrolytes on chemical equilibria; Solving equilibrium calculations for complex systems; Gravimetric methods of analysis; Titrimetric methods of analysis</p> <p>Section B: Inorganic Chemistry: Introduction to molecular orbital theory of simple homo-nuclear and hetero-nuclear diatomic molecules; Periodicity of physical and chemical properties of chemistry of the elements in the p-block and first row transition elements; Introduction to Coordination chemistry.</p>		
<b>Outcomes</b>	<p>Learners must be able to demonstrate:</p> <ul style="list-style-type: none"> <li>An understanding of the theoretical background of the chemical principles those are important in analytical chemistry. Ability to perform calculations to obtain quantitative information from analytical data.</li> <li>Understand of the basic concept of gravimetric methods of analysis and able to perform calculations of results from gravimetric data.</li> <li>Understand the principles of all aspects of chemical equilibria.</li> <li>To be able to perform calculations involving neutralization titrations</li> <li>How the concept of periodicity of elements can be used to rationalize the physical and chemical behaviours of p- and d-block elements.</li> <li>How bonding in simple molecules can be used to predict their physical properties.</li> <li>An understanding of the basic language and concepts used in coordination chemistry and a prelude to third year work.</li> <li>The relevance of some of the content of the module to and application of skills to local industries is envisaged.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments plus 20% Interim assessments.) 60% Summative assessment (3 hour assessment after the course work has been completed)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's		

<b>Title</b>	<b>Organic &amp; Physical Chemistry 2</b>	
<b>Code</b>	<b>4CHM212</b>	<b>Department:</b> <b>Chemistry</b>
<b>Prerequisites</b>	4CHM111, 4CHM112, 4MTH111 or 4MTH112 and Any <b>one</b> of the following: 4PHY111, 4PHY112, 4PHY121 or 4PHY122	<b>Co-requisites:</b> None
<b>Aim</b>	The build on the basic principles of organic and physical chemistry that were introduced at Year Level 1 and to lay the foundation for more advanced studies in these topics at Year Level 3.	
<b>Content</b>	Chemistry of Monofunctional Group I -Alkyl halides; Stereochemistry, Substitution and elimination reaction; Alcohols, phenols and ether; Chemistry of Aromatic Compounds: Electrophilic substitution reaction. Thermodynamics of ideal gas systems. Phase equilibria of one component systems. The properties and behaviour of ions in solution. Cell emfs, their applications and the factors that affect them. The kinetic of gas phase reactions with simple orders.	
<b>Outcomes</b>	Learners must be able to demonstrate: <ul style="list-style-type: none"><li>▪ An understanding of the chemistry functional groups compounds and factors to identify them.</li><li>▪ An understanding of chemical reactions, synthesis and identification when presence as unknown.</li><li>▪ An understanding of what aromatic compounds are and why compounds could be in ring form and not be aromatic in nature.</li><li>▪ An ability to manipulate thermodynamic equations and apply them in calculations.</li><li>▪ A sound insight into the principles governing the phase equilibria of one component systems and the properties and behaviour of ions in solution.</li><li>▪ An understanding of the nature and origin of cell emfs, their applications and the factors that affect them as well as demonstrating an insight into the kinetics of gas phase reactions with simple orders and the ability to perform appropriate calculations..</li></ul>	
<b>Assessment</b>	40% Continuous Assessment Mark (comprising 20% practical assessments plus 20% Interim assessments.) 60% Summative assessment (comprising a 3 hour assessment after the course work has been completed)	
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's	

<b>Title</b>	<b>Organic Chemistry 3</b>		
<b>Code</b>	<b>4CHM311</b>	<b>Department</b>	<b>Chemistry</b>
<b>Prerequisites</b>	4CHM212, 4MTH111 and 4MTH112, Any <b>two</b> of the following: 4PHY111, 4PHY112, 4PHY121 or 4PHY122	<b>Co-requisites</b>	<b>None</b>

<b>Aim</b>	To introduce more advanced facts monofunction compounds and apply them to the synthesis of useful organic compounds and to study basic principles underlying reaction mechanisms. To introduce the principles of spectroscopic methods for organic compound identification.
<b>Content</b>	Introduction to Carbonyl Compounds: Aldehyde and Ketones, Carboxylic Acids, Carboxylic Acids Derivatives and Dicarboxyl Compounds; Spectroscopy
<b>Outcomes</b>	Learners must be able to demonstrate: <ul style="list-style-type: none"> <li>▪ an understanding of more advanced facts and synthetic application of useful organic compounds</li> <li>▪ an understanding to study basic principles underlying reaction mechanisms.</li> <li>▪ an understanding of Spectroscopy In Structure Elucidation</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (comprising 20% practical assessments plus 20% Interim assessments.) 60% Summative assessment (comprising a 3 hour assessment after the course work has been completed)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practicals

<b>Title</b>	<b>Physical Chemistry 3</b>	
<b>Code</b>	<b>4CHM321</b>	<b>Department: Chemistry</b>
<b>Prerequisites</b>	4CHM212, 4MTH111 and 4MTH112, And Any <b>two</b> of the following: 4PHY111, 4PHY112, 4PHY121 or 4PHY122	Co-requisites: None
<b>Aim</b>	The build on the principles that were introduced at Year Level 2 and to lay the foundation for more advanced studies at Year Level 4.	
<b>Content</b>	Gibbs Free Energy, the factors that affect it and its relationship to chemical processes and equilibria. Thermodynamics of phase equilibria and the principles governing two component systems. Transport properties of ions in solution and the Debye Huckel law. Liquid junction potentials other advanced aspects of electrochemical cells.	
<b>Outcomes</b>	Learners must be able to demonstrate: <ul style="list-style-type: none"> <li>▪ An understanding of Gibbs Free Energy, the factors that affect it and its relationship to chemical processes and equilibria.</li> <li>▪ An insight into the thermodynamics of phase equilibria and the principles governing two component systems.</li> <li>▪ An understanding of the transport properties of ions in solution and the Debye Huckel law as well as liquid junction potentials other advanced aspects of electrochemical cells.</li> </ul>	
<b>Assessment</b>	40% Continuous Assessment Mark (comprising 20% practical assessments plus 20% Interim assessments.) 60% Summative assessment	

	(comprising a 3 hour assessment after the course work has been completed)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>Inorganic Chemistry 3</b>		
<b>Code</b>	<b>4CHM312</b>	<b>Department</b>	<b>Chemistry</b>
<b>Prerequisites</b>	(1) 4CHM211 (2) 4MTH111 and 4MTH112 (3) Any <b>two</b> of the following: 4PHY111, 4PHY112, 4PHY121 or 4PHY122	Co-requisites	None
<b>Aim</b>	This module is designed to build on the foundation laid on the chemistry of the elements at the lower levels and to introduce students to co-ordination chemistry and organometallic chemistry. At the end of the module students will be adequately equipped to undertake advanced studies, including basic research in chemistry. Adequate exposure to the applications in industries and mining is envisaged.		
<b>Content</b>	Systematic chemistry of the second and third row transition metal series, illustrated by a selection of any three of the sub-groups, and treated comparatively to the chemistry of first row transition series treated in first and second years. Introduction to coordination chemistry: historical development, nomenclature, isomerism, theory of bonding, electronic spectra and stability, and applications in industry. Introduction to organometallic chemistry, illustrated by complexes of carbon monoxide and alkenes. Outline of applications in chemical and pharmaceutical industries.		
<b>Outcomes</b>	Learners must be able to: <ul style="list-style-type: none"> <li>▪ Relate the similarities and differences between the first row transition metals and second and third transition metal series to the electronic configurations of the elements</li> <li>▪ Account for the differences and similarities in the properties of the second and third transition metal series, and how these relate to the trends in the properties of their compounds</li> <li>▪ Demonstrate adequate understanding of the basic concepts of co-ordination chemistry, which are required in the understanding of advanced topics in co-ordination chemistry as well as are required in the application of co-ordination chemistry in industry and research.</li> <li>▪ The students should understand the theory of bonding in organometallic compounds and the preparations, properties and reactivities of complexes of carbon monoxide and alkenes, and their applications in chemical and pharmaceutical industries.</li> <li>▪ Undertake a series of laboratory exercises that help the students to acquire practical skills in synthesis, physico-chemical analyses, and applications of inorganic compounds. They would also be able to</li> </ul>		

	use basic research equipment when they characterize their compounds.
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments plus 20% Interim assessments.) 60% Summative assessment (3 hour assessment after the course work has been completed)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>Analytical Chemistry 3</b>		
<b>Code</b>	<b>4CHM322</b>	<b>Department</b>	<b>Chemistry</b>
<b>Prerequisites</b>	(1) 4CHM211 (2) 4MTH111 and 4MTH112 (3) Any <b>two</b> of the following: 4PHY111, 4PHY112, 4PHY121 or 4PHY122	Co-requisites	None
<b>Aim</b>	This module is designed to build on the foundation laid in 2 <sup>nd</sup> year Analytical Chemistry and to provide students with key concepts of instrumentation in analytical chemistry and to perform calculations used in electrochemical methods: potentiometry, coulometry, electrogravimetry, voltammetry, spectrochemical methods, chromatographic techniques. At the end of the module students will be adequately equipped to undertake advanced studies, including basic research in chemistry.		
<b>Content</b>	Principles of neutralization titrations and applications, Titration curves for complex acid/base systems. Electrochemical methods: Potentiometry and Applications of potentiometry, Electrogravimetric and Coulometric methods, Voltammetry. Spectrochemical methods, Instruments for optical spectrometry, Molecular absorption spectroscopy. Chromatography methods.		
<b>Outcomes</b>	Learners must be able to demonstrate: <ul style="list-style-type: none"> <li>An understanding of the wide range of analytical techniques that is useful in analytical chemistry.</li> <li>Have an understanding of the principles, equipment, advantages/disadvantages and basic applications of each technique.</li> <li>Have practical experience in some of the key techniques, e.g. Potentiometric titrations, conductimetric titrations, Uv/Vis and PL spectroscopy.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (comprising 20% practical assessments plus 20% Interim assessments.) 60% Summative assessment (comprising a 3 hour assessment after the course work has been completed)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's		



## Department of Computer Science

### **STAFF**

Senior Professor	MO Adigun, PhD, MSc, BSc (Combined Hons), (IFE), MIEEE, PMACM, MSAICSIT
Associate Professor	Vacant
Senior Lecturer	P Mudali, PhD (Computer Science), MSc (Computer Science), BScHons (Computer Science), BSc (UNIZULU), MIEEE, MSAICSIT
Lecturers	GE Ojong, MSc (Loughborough), BScHons (London) IN Ezeji, MSc (Computer Science) (UNIZULU), BScHons (Computer Science) (University of Calabar Nigeria), SU Mathaba, MSc, BScHons, BSc (UNIZULU) Tarwireyi, MSc (Computer Science)(UFH), BScHons (Computer Science) (Rhodes), BSc (UFH), MSAICSIT, MIITP NC Sibeko, MSc (Computer Science), BScHons (Computer Science) (UNIZULU)
nGAP Lecturer	vacant
Computer Literacy instructors	T Ndlovu, BScHons (Computer Science) (UNIZULU) HS Zulu, BScHons (Computer Science) (UNIZULU)
Laboratory Technologist	S Fatyi, BSc (Computer Science) (UNIZULU)
Secretary	KM Enslin, BA (Health Science & Social Services) (Applied Psychology) NDip (Management Assistant) (Lower Umfolozi)
<b>Telkom/Huawei Centre of Excellence in Mobile E-Services</b>	
Centre's Research Leader:	MO Adigun, PhD, MSc, BSc (Combined Hons), (IFE), MIEEE, PMACM, MSAICSIT
Senior Researcher	P Mudali, PhD (Computer Science), MSc (Computer Science), BScHons (Computer Science), BSc (UNIZULU), MIEEE, MSAICSIT

Title	Introductory Computing	
Code	4CPS111	Department: Computer Science
Prerequisites	None	Co-requisites: Any Mathematics module
Aim	To provide an introduction to hardware and software components of computer systems.	
Content	<b>Section A – Computer Architecture</b> Introduction to Digital logic and Digital systems; Machine level representation of data; Assembly level machine organisation <b>Section B – Software Development Fundamentals</b> Fundamental Programming concepts and Object-Oriented Programming	
Outcomes	At the end of the module, the learners should be able to: <ul style="list-style-type: none"> <li>▪ Explain the organization of the classical von Neumann machine and its major functional units.</li> <li>▪ Describe the internal representation of data.</li> </ul>	

	<ul style="list-style-type: none"> <li>Represent Boolean logic problems as: truth tables and logic circuits.</li> <li>Design, implement, test, and debug programs that use fundamental programming constructs such as: basic computation, simple I/O, standard conditional and iterative structures, methods, and parameter passing.</li> </ul>
<b>Assessment</b>	16% practical tests, 16% theory tests, 10% assignments (40% Continuous assessment) 60% final practical and theory examination
<b>DP Requirements</b>	40% Continuous Assessment Mark, 80% Attendance at practical's

<b>Title</b>	<b>Introduction to Programming</b>		
<b>Code</b>	<b>4CPS112</b>	<b>Department</b>	<b>Computer Science</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	4CPS111
<b>Aim</b>	To equip students with foundational programming skills including basic data structures.		
<b>Content</b>	Object oriented programming using Java, UML design of Object-oriented architectures, and an introduction to dynamic data structures.		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>Demonstrate the ability to use Java constructs to build Objects and object relationships and interactions;</li> <li>Usage of UML language to represent core Object-oriented concepts such as encapsulation, inheritance and polymorphism;</li> <li>Acquire skills to use basic data structure algorithms covering array, list, stack and composite data structures based on them.</li> </ul>		
<b>Assessment</b>	40% Theory Examination or test; 30% Practical Examination; 30% Class Test		
<b>DP Requirement</b>	40% minimum must be scored by a student to qualify to write examination.		

<b>Title</b>	<b>Computer literacy I</b>		
<b>Code</b>	<b>4CPS121</b>	<b>Department</b>	<b>Computer Science</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	This course is designed to introduce students to the personal computer. It will enable students to use the available features on an Operating System; it is also designed to instruct students in the use of Word Processors from an introductory to an advanced level.		

<b>Content</b>	<p>The theory component of the course will cover the following topics:</p> <ul style="list-style-type: none"> <li>• Structure of a computer (Components, Peripherals, Use, Type)</li> <li>• The practical component of the course will cover the following topics:</li> <li>• Anatomy of the Window, Control panels</li> <li>• Internet and the World Wide World</li> <li>• Introduction to E-mail</li> <li>• File Management</li> <li>• Basics of Word Processing</li> <li>• Editing and Formatting</li> <li>• Enhancing a document: Web and Other Resources</li> <li>• Advanced Features: Outlines, Tables, Styles and Selections</li> </ul>
<b>Outcomes</b>	<p>On completion of this course the learner should be able to:</p> <ul style="list-style-type: none"> <li>▪ Describe components of the computer system,</li> <li>▪ distinguish between system software and application Software,</li> <li>▪ draw parallel between e-commerce and traditional commerce,</li> <li>▪ Describe the windows desktop and change its appearance,</li> <li>▪ create file and work with folder.</li> <li>▪ Explain the benefits of using Word processor,</li> <li>▪ gain proficiency in editing and formatting a word document,</li> <li>▪ enhance a document by using the web and other useful resources,</li> <li>▪ use and create advanced features.</li> </ul>
<b>Assessment</b>	<p>40% Continuous Assessment (comprising 20% practical assessment plus 20% theory assessments)          60% Summative Assessment (comprising 4 hour practical and theory exam)</p>
<b>DP Requirements</b>	40% Continuous Assessment Mark, 80% Attendance at practical's

Title	Computer literacy II	
Code	4CPS122	Department: Computer Science
Prerequisites	None	Co-requisites: None
Aim	<p>AS in 4CPS011 unless this is a second Computer Literacy course in which case the Course consists of XLS and PPT.</p> <p>Note the following Computer Literacy modules can be selected:</p> <p>[INTRO] Operating System skills including Basic literacy in Web and Email Services of the Internet;</p> <p>[WP]-Word Processing skills as in MS Word;</p> <p>[XLS]- Spreadsheet Skills as in Excel;</p> <p>[PPT]- Presentation Creation and Usage as in PowerPoint usage.</p> <p>Departments that require additional literacy courses are advised to select from one of the following service courses for non-Computer professionals.</p>	

<b>Content</b>	<p>The theory component of the course will cover the following topics:</p> <ul style="list-style-type: none"> <li>▪ Structure of a computer (Components, Peripherals, Use, Type)</li> <li>▪ The practical component of the course will cover the following topics:</li> <li>▪ Anatomy of the Window, Control panels</li> <li>▪ Internet and the World Wide World</li> <li>▪ Introduction to E-mail</li> <li>▪ File Management</li> <li>▪ Introduction to Microsoft Word</li> <li>▪ Editing and Formatting</li> <li>▪ Enhancing a document: Web and Other Resources</li> <li>▪ Advanced Features: Outlines, Tables, Styles and Selections</li> </ul>
<b>Outcomes</b>	On completion of this course the learner should be able to: Describe components of the computer system, distinguish between system software and application Software, draw parallels between e-commerce and traditional commerce, Describe the windows desktop and change its appearance, create files and work with folders. Explain the benefits of using Word processor, gain proficiency in editing and formatting a word document, enhance a document by using the web and other useful resources, use and create advanced features
<b>Assessment</b>	<p>40% Continuous Assessment (comprising 20% practical assessment plus 20% theory assessments)</p> <p>60% Summative Assessment (comprising 4 hour practical and theory exam)</p>
<b>DP Requirements</b>	40% Continuous Assessment Mark 80% Attendance at practical sessions

<b>Title</b>	<b>Data Structures and Algorithms</b>		
<b>Code</b>	<b>4CPS211</b>	<b>Department: Computer Science</b>	
<b>Prerequisites</b>	4CPS111	<b>Co-requisites</b>	4CPS112
<b>Aim</b>	The main aim of this course is to provide an introduction to algorithms and data structures. The secondary aim is to improve the students programming skills.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Basic Analysis techniques</li> <li>• Strategies for studying Efficiency and complexity of algorithms</li> <li>• Data structures covered include but not limited to Lists, Stacks, Queues, Graphs, and Binary trees.</li> <li>• Algorithms covered include search and sorting algorithms such as, Sequential and Binary Search, Insertion Sort and Selection Sort, Heap Sort and Quick Sort, Merge Sort.</li> </ul>		
<b>Outcomes</b>	<p>On completion of this module the learner should be able to:</p> <ul style="list-style-type: none"> <li>▪ demonstrate an understanding of abstract data types</li> <li>▪ Implement lists, stacks and queues as both arrays and linked lists. And be able to use classes from the Java Collections class</li> <li>▪ identify the most appropriate algorithms and data structures for a range of situations</li> <li>▪ understand the concepts of algorithm and data structure efficiency in terms of time/space complexity</li> </ul>		

	<ul style="list-style-type: none"> <li>▪ be able to implement the various commonly occurring algorithms and data structures</li> <li>▪ analyse algorithms and estimate their worst-case and average-case behaviour</li> </ul>
<b>Assessment</b>	40% Continuous Assessment (comprising 20% practical assessment plus 20% theory assessments) 60% Summative Assessment (comprising 4 hour practical and theory exam)
<b>DP Requirements</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>Computer Architecture and Assemblers</b>	
<b>Code</b>	<b>4CPS221</b>	<b>Department Computer Science</b>
<b>Prerequisites</b>	4CPS111	Co-requisites
<b>Aim</b>	The aim of this course is to provide an computer architecture and assemblers.	
<b>Content</b>	<ul style="list-style-type: none"><li>• Introduction to Computer structure and Machine Language;</li><li>• Addressing techniques: indexing; indirect, absolute and relative addressing; Macros; File input/output;</li><li>• Assembly language; Macro and Conditional Assembly,</li><li>• Simple and Complex Data Structures; Disk-File Processing, Interrupt Handling.</li></ul>	
<b>Outcomes</b>	On completion of this module the learner should be able to : <ul style="list-style-type: none"><li>▪ Describe the main components of computer systems that define its architecture (CPU, storage, memory, instruction sets, and addressing modes.</li><li>▪ Discuss the way the main components of computers are interconnected.</li><li>▪ Recognize assembly language syntax while reading and analyzing assembly language programs.</li><li>▪ Design, develop and test programs using Assembly Language commands while featuring various basic Assembly Language operations.</li><li>▪ Design, develop and test programs using Assembly Language .</li></ul>	
<b>Assessment</b>	40% Continuous Assessment (comprising 20% practical assessment plus 20% theory assessments) 60% Summative Assessment (comprising 4 hour practical and theory exam)	
<b>DP Requirements</b>	40% Continuous Assessment Mark 80% Attendance at practical's	

Title	Computer Communications and Networks		
Code	4CPS231	Department	Computer Science
Prerequisites	4CPS111	Co-requisites	
Aim	To provide the student with the fundamental principles and techniques of data communication, LANs and WANs, TCP/IP protocol architecture and wireless network architectures.		

<b>Content</b>	Data Communication: Signals, Digital and analogue transmission, Multiplexing, Error control; Networks: Switching principles, LAN, MAN, WAN; TCP/IP: Network layer addressing and routing, Network layer protocols, Transport layer protocols, Application layer services; Wireless communication: Principles, Wireless LAN systems, Cellular telephony, Microwave and Satellite networks.
<b>Outcomes</b>	On completion of this module the learner should be able to: <ul style="list-style-type: none"> <li>describe the mechanisms and associated data communication protocols.</li> <li>explain the basic principles underlying the functioning of the Internet</li> <li>describe the current wireless technologies employed in networking.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment (comprising 20% practical assessment plus 20% theory assessments) 60% Summative Assessment (comprising 4 hour practical and theory exam)
<b>DP Requirements</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>Introductory Software Engineering</b>		
<b>Code</b>	<b>4CPS212</b>	<b>Department</b>	<b>Computer Science</b>
<b>Prerequisites</b>	4CPS112,	<b>Co-requisites</b>	4CPS211
<b>Aim</b>	The aim of this course is to provide an introduction to the basic principles of Software Engineering		
<b>Content</b>	<b>Section A – Software Engineering</b> Introduction to the Software Problem; Software Process; Planning a Software Project; Software Architecture; Design; Coding and Unit Testing; Testing <b>Section B – Platform-based Development</b> Introduction to Android Apps; Styling a website for Android; Advanced Styling; Native Android App Development		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>Express the Software Development Lifecycle</li> <li>Learn the basics of Android App Development</li> <li>Application of the Software Development Lifecycle whilst developing an Android App</li> </ul>		
<b>Assessment</b>	Students are required to submit two practical projects (an Individual and a Group project). A theory examination is also required		
<b>DP Requirement</b>	An average mark greater than 40% for all submitted Assignments and Projects		

<b>Title</b>	<b>Database and Information Management I</b>		
<b>Code</b>	<b>4CPS232</b>	<b>Department</b>	<b>Computer Science</b>
<b>Prerequisites</b>	4CPS111	<b>Co-requisites</b>	
<b>Aim</b>	The aim of this course is to provide an introduction to databases and information management.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Introduction to databases and Relational databases,</li> <li>Database Design: techniques and models, conceptual design, logical design and normalization.</li> <li>relational algebra and calculus, and SQL</li> </ul>		

<b>Outcomes</b>	<p>On completion of this module the learner should be able to:</p> <ul style="list-style-type: none"> <li>▪ demonstrate an understanding of basic concepts of database systems.</li> <li>▪ demonstrate an understanding of the basics of SQL, construct queries using SQL, and be able to write relational algebra expressions for queries.</li> <li>▪ use sound design principles to perform logical design of databases, including the E-R method and normalization approach.</li> <li>▪ demonstrate familiarity with the basic issues of transaction processing and concurrency control.</li> </ul>
<b>Assessment</b>	<p>40% Continuous Assessment (comprising 20% practical assessment plus 20% theory assessments)</p> <p>60% Summative Assessment (comprising 4 hour practical and theory exam)</p>
<b>DP Requirements</b>	<p>40% Continuous Assessment Mark</p> <p>80% Attendance at practical's</p>

<b>Title</b>	<b>Visual Application Development</b>		
<b>Code</b>	<b>4CPS242</b>	<b>Department</b>	<b>Computer Science</b>
<b>Prerequisites</b>	4CPS111	Co-requisites	
<b>Aim</b>	To introduce learners to how to program in Visual Basic as well as the fundamentals of visual applications development.		
<b>Content</b>	Introduction to Visual Basic 2005 IDE, Introduction to classes and objects, Control statements (If/Then/Else, While, Do While/Loop, Do Until/Loop, For/Next, Do/Loop While, Do/Loop Until, Exit, Continue, Nest control statements), Methods, Arrays, Object-oriented programming: Inheritance and Polymorphism, Exception handling, Graphical user interface concepts (Event handling, Labels, Textboxes, Buttons, Picture boxes, Menus and List Box, Checked List Box, Combo Box controls), Multithreading, Strings, Characters, Regular expressions, Files and Streams		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Differentiate a console and visual program,</li> <li>▪ Learn to write console and visual programs in Visual Basic,</li> <li>▪ Learn control statements,</li> <li>▪ Know how the concepts of classes and objects work in VB,</li> <li>▪ Be able to handle exceptions,</li> <li>▪ Learn using visual controls in VB,</li> <li>▪ Learn how multithreading is achieved,</li> <li>▪ Be able to manipulate strings, characters and regular expressions,</li> <li>▪ Know how to handle files and streams in programs.</li> </ul>		
<b>Assessment</b>	2 x 2h00 theory interim assessments, 1x3h00 practical interim assessment, 1 x 1 group practical assignment, and 1 x 4h00 summative assessment which involves theory and practical		
<b>DP Requirement</b>	This module consists of theory and practical components. The practical component contributes 40% to the overall assessment. To pass the module, a sub-minimum of 40% in both the practical and theory components is mandatory.		

<b>Title</b>	<b>Advanced Programming Techniques</b>		
<b>Code</b>	<b>4CPS311</b>	<b>Department</b>	<b>Computer Science</b>
<b>Prerequisites</b>	<b>4CPS211 OR 4CPS212</b>	<b>Co-requisites</b>	<b>4CPS211</b>
<b>Aim</b>	To help students inculcate emerging professional practices beyond object orientation with clear emphasis on enterprise development technologies.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Articulate and apply principles of engineering reusability: simplicity, safety from bugs, ease of understanding, and readiness for change.</li> <li>• Solid grasp of, and ability to apply, key software engineering ideas, including interfaces, representation invariance, specifications, invariants, data abstraction, design patterns, and unit testing.</li> <li>• Design, implement, and test a small- to medium-scale software system (thousands of lines of code, multiple modules).</li> <li>• Experience developing software collaboratively in a team.</li> <li>• Use modern programming tools (e.g. Eclipse, Subversion, JUnit) and modern programming technologies (e.g. I/O, regular expressions, network sockets, threads, GUIs).</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Gain mastery in the usage of core patterns in typical frameworks;</li> <li>▪ Use pattern knowledge to understand typical framework for enterprise software development;</li> <li>▪ Engage with tools for Enterprise Systems Development.</li> </ul>		
<b>Assessment</b>	40% Theory Examination or test; 30% Practical Examination; 30% Class Test		
<b>DP Requirement</b>	40% minimum must be scored by a student to qualify to write examination.		

<b>Title</b>	<b>Systems Programming (OS and Compilers)</b>		
<b>Code</b>	<b>4CPS321</b>	<b>Department</b>	<b>Computer Science</b>
<b>Prerequisites</b>	<b>4CPS212</b>	<b>Co-requisites</b>	
<b>Aim</b>	To introduce the concepts of programming the computer at the system level with particular emphasis on operating systems and formal language recognizer's		
<b>Content</b>	<b>Section A – Foundational Concepts</b> Introduction to Assembly Language; Assembling; Linking and Running Assembly Language programs; <b>Section B – Operating Systems Principles</b> Process and thread management, Device management, Memory management, File systems, and Input/output and concurrency principles.		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Learn to program in Assembly Language</li> <li>▪ Learn to program in C</li> <li>▪ Develop a compiler for a subset of C</li> </ul>		
<b>Assessment</b>	Students are required to submit three programming projects. A theory examination is also required.		
<b>DP Requirement</b>	An average mark greater than 40% for all submitted Assignments and Projects		



<b>Title</b>	<b>Database and Information Management II</b>		
<b>Code</b>	<b>4CPS331</b>	<b>Department</b>	<b>Computer Science</b>
<b>Prerequisites</b>	4CPS231	Co-requisites	
<b>Aim</b>	The aim of this course is to introduce to learners the current trends in database technologies.		
<b>Content</b>	Introduction to Client/Server systems and Object-Oriented database models. Transaction Management, concurrency control and performance tuning. Distributed Database Management; Data Warehouse : DSS architecture, OLAP and star schemas; Database connectivity and Web development		
<b>Outcomes</b>	<p>On completion of this module the learner should be able to:</p> <ul style="list-style-type: none"> <li>Understand client/server architecture;</li> <li>Understand OO principles: objects, OID, messages, protocols, inheritance, object schemas including instance representations.</li> <li>Describe a transaction according to its properties.</li> <li>Understand concurrency control with respect to the three anomalies: lost update, uncommitted data and inconsistent retrieval.</li> <li>Describe locking-, time stamping- and optimistic methods and recovery management. -understand performance-tuning concepts, SQL processing by DBMS, and introduction to DBMS tuning for optimal performance.</li> <li>Describe the components of a DDBMS, data- and process distribution and data fragmentation. Introduction to the concepts of data warehousing.</li> <li>To understand the different connectivity types and Web to database middleware.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment (comprising 20% practical assessment plus 20% theory assessments) 60% Summative Assessment (comprising 3 hour theory exam)		
<b>DP Requirements</b>	40% Continuous Assessment Mark 80% Attendance at practicals		

<b>Title</b>	<b>Distributed Systems Development</b>		
<b>Code</b>	<b>4CPS312</b>	<b>Department</b>	<b>Computer Science</b>
<b>Prerequisites</b>	4CS321	Co-requisites	
<b>Aim</b>	To provide an introduction to design and implementation of distributed systems, building on some concepts from Operating systems		
<b>Content</b>	<b>Distributed Systems principles:</b> System Architectures, Networking and internetworking; Communication, Distributed processes, Naming, Transactions and Concurrency Control, Security <b>Distributed Systems Paradigms:</b> Distributed Object-based Systems, Distributed web-based systems <b>Practical:</b> Elementary database design and implementation, Enterprise Java Beans for development distributed object based systems, <b>Apache CXF/Axis and Apache Tomcat for development of web services</b>		
<b>Outcomes</b>	By the end of this unit the learner should be able to:		

	<ul style="list-style-type: none"> <li>Characterise and explain, the following concepts in distributed systems               <ul style="list-style-type: none"> <li>System Architectures.</li> <li>Networking and internetworking</li> <li>Communication.</li> <li>Distributed Process Management</li> <li>Naming</li> <li>Transactions and Concurrency Control</li> <li>Security</li> </ul> </li> <li>Explain how the principles understood in outcome (1) are used in the following paradigms:               <ul style="list-style-type: none"> <li>Distributed Object-based Systems</li> <li>Distributed Web-based Systems</li> </ul> </li> <li>Develop some distributed web-based and object-based systems.</li> </ul>
<b>Assessment</b>	<b>Interim Assessments:</b> 3 X 1hr00 interim assessments, 2 X 3hr00 interim practical assessments, 1 assignment. <b>Final Examination:</b> 1 X 3hr00 paper. The weights of the assessments are as follows: <ul style="list-style-type: none"> <li>Interim assessments carry a weight of 40%</li> <li>Final Examination carries 60 %.</li> </ul>
<b>DP Requirement</b>	To sit for the final examination a student must have an average of at least 40% on interim assessments. To pass the course a student should have scored above a sub-minimum of 40% in the final examination.

<b>Title</b>	<b>Final Year Project</b>		
<b>Code</b>	<b>4CPS322</b>	<b>Department</b>	<b>Computer Science</b>
<b>Prerequisites</b>	4CPS212/4CPS242	<b>Co-requisites</b>	(4CPS311, 4CPS321) or (4CPS232, 4CPS331)
<b>Aim</b>	To enable students demonstrate what they have learnt in a small-sized but significant real-life type individual software development project.		
<b>Content</b>	The student is allocated a supervisor who guides the student to select a non-trivial project latest by the end of Semester 1. Student must prepare a plan, and follow the plan in design and development of the semester long project.		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>Software project development plan;</li> <li>Software design document;</li> <li>Software implementation code; and</li> <li>Project report.</li> </ul>		
<b>Assessment</b>	The project development plan must be ready at the end of Semester one. Plan is graded by an assessor different from the supervisor [25%]. Design Document must also be approved prior to implementation [25%]. Software Implementation with Code Demo in addition to Project report must be assessed by two assessors other than the supervisors [50%]. Final Mark is an average of supervisor's plus other assessors' marks for each of the three outcomes.		
<b>DP Requirement</b>	A sub-minimum of 40 is required from Plan plus Design assessments to pass the module.		

<b>Title</b>	<b>Client / Server Computing</b>		
<b>Code</b>	<b>4CPS332</b>	<b>Department</b>	<b>Computer Science</b>
<b>Prerequisites</b>	4CPS112 or 4CPS242	Co-requisites	
<b>Aim</b>	To introduce the concepts of client/server programming by learning how to access documents/information on web servers from a web client.		
<b>Content</b>	Basics of web site development, Introduction to basic (X)HTML tags, Web Layout with tables and Frames, Page formatting with CSS, Dynamic web sites with client-side scripting -JavaScript. Images on the Web – GIF, JPEG, PNG. Web Animations – GIF animations, Macromedia Flash, Java Applets. Multimedia on the web – adding audio and video. Server-side scripting languages – Perl, PHP, JSP, ASP, Servlet. Databases on the web – MySQL server.		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Learn the basics of web site development;</li> <li>▪ Know the basic protocol for accessing information on a web server; be able to write scripts to control the behaviour of web pages;</li> <li>▪ learn to develop simple web database application.</li> </ul>		
<b>Assessment</b>	2X 1h00 theory interim assessments, 1X3h00 practical interim assessment, and 1 x 4h00 summative assessment which involves theory and practical		
<b>DP Requirement</b>	This module consists of theory and practical components. The practical component contributes 40% to the overall assessment. To pass the module, a sub-minimum of 40% in both the practical and theory components is mandatory.		

## Department of Consumer Sciences

### **STAFF**

Associate Professors	U Kolanisi, B (Human Ecology) (UWC), M (Consumer Science), PhD (North West PUK)
Senior Lecturer	CJ du Preez, B (Home Economics) (Stell), HDE (UNISA), MSc, PhD (Wageningen Univ Netherlands)
Secretary	N Nxele Dip (Office Admin) (Varsity College)
Lecturers	TP Kheswa, BSc (Home Economics) (Natal), BEd, B (Home Economics), Hons (UNIZULU), MCom (Nutrition) (University of Queensland, Australia), PhD (UKZN)
	NK Ndwandwe, B (Home Economics) (UNIZULU), Dip (Information Tech) (Working World), M (Consumer Science) (NWU), PhD (UKZN)
	NC Shongwe, BSc (Home Economics) (UNISWA), BSc (Agric Food Science) Hons, MSc (Agriculture) (Food Science) (UFS)
	ME Chibe, Dip, BTech, MTech (Food and Beverage Management) (VUT)
	J Benadé, BSc (Home Economics) (UFS), B (Home Economics), Hons (UNIZULU)
Laboratory Assistants	N Ngwane, Diploma (Consumer Science: Food and Nutrition) BTech (Consumer Science: Food and Nutrition) DUT
	(VACANT)
Laboratory Assistant/Chef	Vacant (Richards Bay Campus)
Laboratory Helper	Vacant (KwaDlangezwa Campus)

### FOOD SERVICES

Title	Basic food preparation/Culinary studies		
Code	4CFD112	Department	Consumer Sciences
Prerequisites	None	Co-requisites	4CFH112
Aim	This course aims at providing learners with a knowledge and understanding of the safe and correct use of kitchen equipment, basic workplace skills and the principals involved in various cooking methods used in the preparation of food for the hospitality industry.		
Content	<ul style="list-style-type: none"> <li>Introduction to the catering and hospitality industry.</li> <li>Measuring techniques: SI metric system, Measuring equipment.</li> <li>Recipe conversions. Vocabulary of cooking.</li> <li>Small scale kitchen equipment and use.</li> <li>Methods of heat transfer.</li> <li>Principles of various cooking methods: boiling, poaching, steaming, stewing, braising, baking, roasting, grilling, deep frying and shallow frying.</li> <li>Regeneration of pre-prepared food.</li> <li>Cold food preparation.</li> </ul>		

<b>Outcomes</b>	<ul style="list-style-type: none"> <li>An understanding of the terms 'hospitality' and 'catering'.</li> <li>A sound base of vocabulary used in the hospitality industry.</li> <li>The ability to convert recipes using the SI system.</li> <li>Skills in using measuring equipment and the ability to apply these skills in practical cooking. Knowledge of the various sectors and different types of operations in the industry.</li> <li>A sound foundation of high quality skills and the ability to apply these skills across a range of processes and commodities.</li> <li>Identify the correct tools and equipment to utilize during the production and presentation of prepared foods.</li> <li>The ability to identify, interpret and describe various methods of heat transfer used in the preparation of food.</li> <li>A comprehension of various cooking methods and the ability to relate this knowledge in practical applications.</li> <li>An understanding of the different types of foods and the use of regenerated and pre-prepared foods in the preparation of meals</li> <li>Be competent at preparing and cooking a range of dishes using various cooking methods. The ability to work effectively in a team.</li> <li>Demonstrate a sound understanding of food safety in storing, preparing and cooking food.</li> </ul>
<b>DP Requirement</b>	40% Continuous Assessment Mark 80 % attendance of lectures/practical.

<b>Title</b>			
<b>Code</b>	<b>Meal Planning and Management</b>		<b>Consumer Sciences</b>
<b>Prerequisite</b>	4CFS112 or 4CFD112 AND 4CFH112	Co-requisites	None
<b>Aim</b>	To provide the student with the ability & skills to plan, manage, prepare and evaluate nutritious meals for different groups of people who have differing needs & requirements. This is an applied module that uses acquired knowledge on basic principles of food cookery & handling as well as applying the systems approach to foodservice.		
<b>Content</b>	Goals and principles of meal planning and management for food production for the household and institutional food service delivery. History of the foodservice industry. The systems approach to foodservice; sanitation and safety in the foodservice; Practical's: Food production management in teams. Menu planning; recipe standardization; planning of purchasing; food preparation and service.		
<b>Outcomes</b>	<b>Theory:</b> On completion of this module the student will be able to: <ul style="list-style-type: none"> <li>Compile and plan diets and meals by applying the goals of meal management for families or institutions.</li> <li>Identify the food needs of different groups and plan menus accordingly</li> <li>Classify the different types of menus that can be found</li> </ul>		

	<ul style="list-style-type: none"> <li>Describe and plan the various styles of service depending on the situation</li> <li>Plan special meals for different functions with a diverse group of people</li> <li>Apply the systems concept to the functioning of the foodservice unit</li> </ul> <p><b>Practical:</b> On completion the students will be able to:</p> <ul style="list-style-type: none"> <li>Compile menus &amp; meals according to the needs of the different people.</li> <li>Write the menus according to a set format</li> <li>Demonstrate the skills of management of available resources and their working environment during meal preparation.</li> <li>Food production management in teams.</li> <li>Menu planning; recipe standardization; planning of purchasing; food preparation and service.</li> </ul>
<b>Assessment</b>	Formative: Assignments, tutorials, presentations and class tests (40%), Summative: Final examination (3 hours) (60%) 40% subminimum in all assessments
<b>DP Requirement</b>	40% continuous assessment mark 80% attendance at lectures and practical's/tutorials

<b>Title</b>	<b>Quantity food production</b>		
<b>Code</b>	<b>4CFD212</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisite</b>	4CFD112/4CFS112	Co-requisite	4CFD211
<b>Aim</b>	To enable the student to plan a foodservice layout and placement of equipment and to produce large quantities of food. It also entails the application of management principles in the foodservice unit.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Facilities planning and design; a study of equipment and furnishings Layout: detailed arrangement of equipment, floor space, and counter space; environmental management. Food product flow.</li> <li>Production of large quantities of food: Recipe formulation and standardization, Production forecasting, scheduling, production control.</li> <li>Review DOH manual for the planning of an institutional or health facility foodservice unit</li> <li>Assembly and distribution of meals, meal costing. Baking for profit</li> <li>Service styles</li> <li>Ration scales and their translation into meal plans</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>A demonstrable ability to plan a foodservice layout and design which takes into account the appropriate flow of food and products in a foodservice unit</li> <li>A demonstrable ability to plan nutritious appealing food combinations and menus that are customer based within a defined budget.</li> <li>A demonstrable ability to scale recipes for a pre-determined number of clients without compromising on quality and safety.</li> </ul>		

	<ul style="list-style-type: none"> <li>▪ A demonstrable ability to work within a team of foodservice workers.</li> <li>▪ A demonstrable ability to manage a team of fellow students who are foodservice workers.</li> <li>▪ A demonstrable ability to write a report as a foodservice manager.</li> <li>▪ A demonstrable ability to translate ration scales into meal plans</li> </ul>
<b>Assessment</b>	Formative: Assignments, tutorials, presentations and class tests (40%), Summative: 3-hour final examination (60%) 40% subminimum in all assessments
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and practical's/tutorials

<b>Title</b>	<b>Organization and management of food services</b>		
<b>Code</b>	<b>4CFD222</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisite</b>	<b>4CFD112</b>	<b>Co-requisite</b>	<b>None</b>
<b>Aim</b>	To give the student an understanding of the importance of the correct flow of food through the various components of a food service operation, the activities and functions of the different components and their relatedness.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Food service models.</li> <li>• Purchasing, storage, inventory records and controls.</li> <li>• The movement of products (food &amp; non-food items) through the distribution channel/ marketing channel.</li> <li>• The critical points for safe receiving and storage of food products.</li> <li>• The management process; Types of managers; Roles of managers. Management skills, Management functions</li> <li>• Tools of management, managing quality in the foodservice</li> <li>• Human resource management: Staffing, Recruitment, selection</li> <li>• Labor management relations</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Differentiate between the various food service models.</li> <li>▪ Define activities conducted in purchasing, storage, inventory records and controls.</li> <li>▪ Discuss the movement of products (food &amp; non-food items) through the distribution channel/ marketing channel.</li> <li>▪ Compare the different methods of purchasing, storage, inventory records and controls employed by differently sized foodservice organizations.</li> <li>▪ Explain the critical points for safe receiving and storage of food products.</li> <li>▪ Demonstrate an ability to manage human capital</li> <li>▪ Demonstrate communication skills through oral &amp; written presentations of reports</li> <li>▪ A demonstrable ability to differentiate between the different types of managers, their role, skills and functions</li> <li>▪ An understanding of the staffing process and labor relations.</li> </ul>		

<b>Assessment</b>	Formative: Assignments, tutorials, presentations and class tests (40%), Summative: 3-hour final examination (60%) 40% subminimum in all assessments
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and practical's/tutorials

<b>Title</b>	<b>Food and Beverage Management</b>		
<b>Code</b>	<b>4CFD311</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisites</b>	4CFD212	Co-requisites	4CFD222
<b>Aim</b>	This course will enable the students to appraise the components of food and beverage service management in various types of food service systems. The students will learn cost and sales concepts and their relationship with profits. The student will learn how to calculate costs and profits and apply control concepts factors for food, beverage and labor control.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction to food and beverage management</li> <li>• The meal experience</li> <li>• Managing quality in food and beverage operations.</li> <li>• Food menus and beverages lists</li> <li>• Food and beverage control</li> <li>• Financial aspects of food and beverage</li> <li>• Purchasing of beverages</li> <li>• Receiving, storing and issuing of beverages.</li> <li>• Food and beverage service methods</li> <li>• Food and beverage production control</li> <li>• Food and beverage management in function, hotel and industrial catering.</li> </ul>		
<b>Outcomes</b>	<p>The learner will be able to:</p> <ul style="list-style-type: none"> <li>▪ Manage the service of food and beverage production to satisfy customer expectations.</li> <li>▪ Evaluate the importance of the complete 'meal experience'</li> <li>▪ Manage quality in food and beverage operations.</li> <li>▪ Have knowledge of the control, purchasing, receiving, storing and issuing of beverages.</li> <li>▪ Plan, cost and develop menus for a theme event.</li> <li>▪ Develop contingency and organizational planning skills in the execution of both events.</li> <li>▪ Demonstrate the importance of training and motivation for employees.</li> <li>▪ Manage time and resources to achieve operational objectives.</li> </ul>		
<b>Assessment</b>	Formative: 40% Continuous Assessment Mark (practical assessments; Interim test; Assignment) Summative: 40% 3-hour exam, 20% practical exam		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80 % attendance of lectures. 90% attendance of practical's.		



<b>Title</b>	<b>Food Marketing</b>		
<b>Code</b>	<b>4CFD312</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisites</b>	4CFS112, 4CNU 112, 4CNS212	Co-requisites	4CFS 211
<b>Aim</b>	Enable students to apply marketing principles to food in the context of consumer behaviour patterns.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• The food marketing system</li> <li>• Approaches to the study of food marketing -</li> <li>• Stakeholders in the food marketing chain (Functional view)</li> <li>• Marketing as a value added process, agricultural production and marketing</li> <li>• Consumers and food marketing, the business environment</li> <li>• Marketing strategy (segmentation, targeting, positioning, the 4P's</li> <li>• Food and Nutrition marketing – labelling and claims, food promotion</li> <li>• Food marketing trends – wholesaling, retailing</li> <li>• Behavioural view to food marketing -Food consumption and marketing, consumer choice, guidelines to marketing food to children</li> <li>• Environmental and social issues in food marketing- Functional foods, genetically modified foods in the context of consumer perspective</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Understand basic terminology related to marketing and food marketing.</li> <li>▪ Demonstrate understanding of the structure of the food industry, major players and the nature of the food marketing system.</li> <li>▪ Understand a company's marketing strategy to selected commodities/products</li> <li>▪ Analyse case studies and identify environmental factors affecting the performance of a company's marketing strategy</li> <li>▪ Discuss how marketing add value to farm products.</li> <li>▪ Debate environmental/social issues in food marketing that affect the consumer</li> <li>▪ Demonstrate the use of oral and written communication skills.</li> </ul>		
<b>Assessment</b>	Formative: Continuous assessment mark 40% (Class interim tests 20%; Tutorials 20%) Summative: 3-hour final exam 60% 40% subminimum in all assessments		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance lectures, tutorials and fieldwork		

## FOOD SAFETY

Title	Food Safety and Hygiene			
Module Code	4CFH112	Department		Consumer Sciences
Prerequisites	None		Co-requisites	None
Aim/purpose	This course seeks to provide students with a knowledge and understanding of the basic principles and procedures for achieving and maintaining high sanitation and safety standards in the hospitality industry.			
Content	<ul style="list-style-type: none"> <li>• Food Safety for catering</li> <li>• Food, personal and equipment hygiene.</li> <li>• Food hygiene legislation.</li> <li>• Safe food preparation and storage.</li> <li>• Health and safety practices.</li> <li>• Bacteria and food poisoning.</li> <li>• Food borne illness.</li> <li>• Cleaning and disinfection.</li> <li>• Kitchen pests, Sanitation and waste disposal.</li> <li>• HACCP.</li> </ul>			
Outcomes	<ul style="list-style-type: none"> <li>▪ An understanding of his/her responsibility for personal cleanliness during food preparation and cooking in the workplace.</li> <li>▪ The ability to identify and describe correct food storage, storage control, stock rotation system and record keeping.</li> <li>▪ The knowledge to differentiate between food spoilage and food poisoning.</li> <li>▪ The ability to differentiate between various organisms causing food spoilage and food poisoning.</li> <li>▪ An understanding of factors that encourages the growth of microorganisms.</li> <li>▪ Comprehension of factors causing the death of microorganisms.</li> <li>▪ The ability to classify cleaning and disinfecting agents as used in the hospitality industry.</li> <li>▪ Knowledge of kitchen pests.</li> <li>▪ Knowledge of sanitation and waste disposal in the hospitality industry.</li> <li>▪ Comprehension of HACCP in the workplace.</li> <li>▪ Knowledge of food hygiene legislation.</li> <li>▪ Knowledge of illness caused by bacteria, toxins, protozoa, viruses and parasitic worms.</li> <li>▪ An understanding of the importance of following health and safety procedures in the workplace.</li> <li>▪ The ability to describe the types and use of safety signs and the types of hazards and incidents that require reporting.</li> </ul>			
Assessment	Formative: 40% Continuous Assessment Mark (16% practical assessments; 16% Interim test; 5% Assignment; 5% Portfolio) Summative: 60% Formal end of module exam (3 hours)			

<b>DP Requirement</b>	40% Continuous Assessment. Mark 80% Attendance at theory and practical's.
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### FOOD SCIENCE

<b>Title</b>	<b>Introduction to Food Science</b>		
<b>Module Code</b>	<b>4CFS112</b>	<b>Department</b>	<b>Consumer Science</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	4CFH112
<b>Aim/Purpose</b>	<p>To expose students to scientific principles directly applied to changes in foods during preparation using basic concepts from chemistry, physics, biology and microbiology.</p> <p>To examine the behaviour of basic constituents common to food products and relate the behaviour to the structure and properties of different foods.</p>		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Measuring techniques in food preparation and experimentation.</li> <li>• Heat transfer methods and cooking methods.</li> <li>• Colloid chemistry and application to food systems. Classification, physical, chemical properties/ reactions of food constituents water, cereals and carbohydrates, proteins- eggs, milk meat, poultry seafood, lipids, fruits and vegetables as subject to various treatments – heat, cold, chemicals.</li> <li>• Vegetable protein – soy, soy processing products, nutritive value.</li> <li>• Gelatin experiments and preparation.</li> <li>• Food evaluation – objective and sensory methods.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Explain basic concepts relating to the chemical and physical properties of water, carbohydrates, proteins, fats, fruit and vegetables.</li> <li>▪ Explain the basis of heat transfer methods.</li> <li>▪ Analyse and compare the effects of various preparation methods on the chemical properties of cereals, starches, proteins, fruits and vegetables through experimental methods.</li> <li>▪ Identify and appropriately interpret information in evaluating prepared food products through sensory methods.</li> <li>▪ Engage in recipe analysis</li> <li>▪ Demonstrate communication skills in written experimental form.</li> </ul>		
<b>Assessment</b>	<p>Formative: 40%</p> <p>Continuous Assessment Mark: (Class interim tests (20%), Practical (20%))</p> <p>Summative: Final examination, 3 hrs. final exam (60%)</p>		
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark</p> <p>80% Attendance at lectures, practical's and fieldwork</p>		

<b>Title</b>	<b>Food Processing Technologies</b>		
<b>Code</b>	<b>4CFS211</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisites</b>	4CFH112, 4CFS112	<b>Co-requisites</b>	None
<b>Aim</b>	<p>The aim of this course is to introduce students to the principles of conventional food preservation methods and industrial technologies applied by the food industry.</p>		

<b>Content</b>	<ul style="list-style-type: none"> <li>Review of causes of food spoilage, the plant cell. Unit operations in food processing. Equipment studies.</li> <li>Review microbial growth, Principles of food preservation</li> <li>Thermodynamics and thermal properties of food (D,Z F values). Use of high temperatures pasteurization, UHT treatment, sterilization. High temperature processing methods- canning</li> <li>Low temperature methods – Refrigeration, Chilling, Freezing</li> <li>Food Dehydration - control of water activity – drying fruit and vegetables, concentration. Preservatives: sugar, acid, curing agents ( jam making, pickling, curing, processed meat products - sausages)</li> <li>Introduction to fermented foods– LAB and mycotoxins of Fusarium. Fermented traditional foods in South Africa.</li> <li>Food packaging technologies – principles, aseptic packaging, vacuum packaging, modified atmosphere packaging, recent innovative packaging</li> <li>Irradiation, high pressure processing,</li> <li>Additives, Food labeling, HACCP, ISO 9001/current quality systems</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>Explain the principles behind each of the preservation methods.</li> <li>Evaluate effectiveness of each of the various methods in achieving microbial safety, nutritional quality and economic advantages</li> <li>Assess the appropriate methods and equipment of preserving selected food types.</li> <li>Engage in experimental preservation of selected food types.</li> <li>Apply the principles of HACCP in the processing and production of selected foods e.g. yoghurt, cottage cheese, processed meat, fruit leathers, fruit and/vegetable juices, chutneys through laboratory practical's.</li> </ul>
<b>Assessment</b>	Formative: 40% Continuous Assessment Mark (20% practical assessments; 20% tests and field reports) Summative: 60% Formal end of module exam (3 hours) 40% subminimum in all assessments
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures, practical's and fieldtrips.

<b>Title</b>	<b>Food Product Development</b>		
<b>Code</b>	<b>4CFS311</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisite</b>	4CFS112, 4CFS211	Co-requisite	4CFD312 (EXPOSURE)
<b>Aim</b>	The aim of this course is to give students a problem-based interdisciplinary capstone learning experience designed to enhance career skills (critical thinking, decision making, team work, communication etc.) in the context of food industry's approach to developing new and improved food products.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Overview, processes and stages of food product development</li> </ul>		

	<ul style="list-style-type: none"> <li>• Standardization and Formulation of recipes:</li> <li>• Recipe development, ingredients formulation and concept idealization.</li> <li>• Review of chemical, physical properties and functions of ingredients in product development, recipe development and food preparation.</li> <li>• Sensory Evaluation: Definitions, test types and Application</li> <li>• Techniques used to measure food sensory aspects</li> <li>• Product development in laboratory</li> <li>• Sensory Analysis, Shelf life and food stability of developed products</li> <li>• Product Performance testing: Consumer taste panels, acceptance of product</li> <li>• Product Marketing</li> <li>• Role of HACCP in Food Product Development</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ The knowledge on application of food product development techniques</li> <li>▪ The ability to develop a novel food product from initial stages through trials and shelf life evaluation.</li> <li>▪ Understand the processes and unit operations in food processing as demonstrated both conceptually and in practical laboratory settings.</li> <li>▪ Understand the recipe standardization unit operations required to produce a given food product.</li> <li>▪ Understand the principles and current practices of processing techniques and the effects of processing parameters on product quality.</li> <li>▪ Understand the properties and uses of various packaging materials.</li> <li>▪ Be able to apply and incorporate the principles of food science in practical, real-world situations and problems.</li> <li>▪ Understand the basic principles of sensory analysis.</li> <li>▪ Be aware of current topics of importance to the food industry</li> <li>▪ Demonstrate time management, handling multiple tasks and teamwork skills.</li> <li>▪ Demonstrate oral and written communication skills. This includes writing technical reports, letters and memos; communicating technical information to a non-technical audience and technical; and formal &amp; informal presentations.</li> </ul>
<b>Assessment</b>	<p>Formative: 40% Continuous Assessment Mark (Class tests - 20%; Prac - 20 %)</p> <p>Summative: 3-hour final exam (60 %) 40% subminimum in all assessments</p>
<b>DP Requirement</b>	<p>40 % Continuous Assessment Mark</p> <p>80 % attendance at lectures, tutorials/practical's</p>

## INTERIOR & HOUSING

INTERIOR & HOUSING			
<b>Title</b>	<b>Principles of design and interiors</b>		
<b>Code</b>	<b>4CHC212</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	To provide students with knowledge and understanding of art elements and principles as applied in interior planning; selection, use and maintenance of materials used in interior planning; and planning of interior spaces.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Steps in the design process and different types of design.</li> <li>• Design elements (e.g. line, space, shape and form, colour, texture) and design principles (e.g. balance, rhythm, emphasis, proportion, harmony, unity) and its application in interior design.</li> <li>• Environmental issues, including energy conservation and efficiency in the home; Technical requirements, including plumbing, heating, ventilation, electrical, acoustical, safety and security.</li> <li>• Interior components e.g. walls and ceilings, floors and stairways, windows and doors, and lighting.</li> <li>• Characteristics, selection and maintenance of floor, wall and window treatments, and lighting; Introduction to ergonomics</li> <li>• Planning of social, work and private spaces; Floor plan selection and evaluation.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Describe and apply the steps in the design process and distinguish between different types of design.</li> <li>▪ Display knowledge of art elements and principles and be able to apply both in interior planning.</li> <li>▪ Understand the importance and demonstrate knowledge of environmental issues and technical requirements when designing or purchasing a home.</li> <li>▪ Demonstrate knowledge of the materials used in construction of a home.</li> <li>▪ Describe and select appropriate materials for use in the home.</li> <li>▪ Explain the criteria for placement of walls, windows, doors and lighting.</li> <li>▪ Describe various aspects and select floor, wall and window treatments, and lighting.</li> <li>▪ Demonstrate skills in problem solving as applied in the design process.</li> <li>▪ Demonstrate awareness considering ergonomics the design process.</li> <li>▪ Apply knowledge in planning of social, private and work spaces.</li> <li>▪ Evaluate a various aspects of different floor plans.</li> </ul>		
<b>Assessment</b>	Formative: Continuous assessment, 40% (class tests, assignments and reports, and oral and visual/poster presentations) Summative: 3-hour final examination, 60% 40% subminimum in all assessments		
<b>DP Requirement</b>	40% Continuous Assessment Mark		

	80% Attendance of lectures and practical's/tutorials
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<b>Title</b>	<b>Housing Education and Environment</b>		
<b>Code</b>	<b>4CHC312</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisite</b>	4CNS211	Co-requisite	None
<b>Aim</b>	To provide students with an in-depth knowledge of human needs in housing focusing on the ecological, socio-psychological and the cultural aspects. Students will gain insight into housing policy and practice, housing delivery strategies in South Africa, housing legislation and finance for housing and review topical issues surrounding delivery such as densification and community participation in housing provision		
<b>Content</b>	Definition of concepts, housing in human perspective, evaluation of housing choices; housing policy pre- and post-1994 and policy formulation at local government level; housing legislation and finance; community participation in housing; evaluation of housing choices and decision making processes; various forms of housing and types of home ownership; costs and procedures involved in buying a home.		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Develop an understanding of concepts related to housing.</li> <li>▪ Understand housing as a basic human need.</li> <li>▪ Examine the theoretical frameworks central to housing.</li> <li>▪ Policy formulation at local government level.</li> <li>▪ Understand the various Housing Acts/Legislations</li> <li>▪ Critically evaluate the different subsidy instruments used to address housing challenges in South Africa.</li> <li>▪ Understand the impact of HIV/AIDS on a household's ability to obtain and maintain accommodation.</li> <li>▪ Understand housing as an environmental issue.</li> <li>▪ Gain insight into various tenure options and housing forms.</li> <li>▪ Develop research and report writing skills</li> <li>▪ Communicate effectively, orally and in written form.</li> </ul>		
<b>Assessment</b>	Formative: 40% Class tests; assignments; portfolio, oral/poster presentations, case studies Summative: 60% 3-hour final examination 40% subminimum in all assessments		
<b>DP Requirement</b>	40% continuous assessment mark 80% Attendance of lectures, tutorials/practical's		

### HOSPITALITY

<b>Title</b>	<b>Introduction To Hospitality Management</b>		
<b>Code</b>	<b>4CHT111</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisite</b>	None	Co-requisite	None
<b>Aim</b>	To provide students with an overview of hospitality services and expectations of the industry in provision of quality service.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Hospitality services and link with tourism.</li> <li>• Hotel business development and classification.</li> </ul>		

	<ul style="list-style-type: none"> <li>• General introduction to food and beverage services and current trends. Restaurant business and classification, restaurant operation.</li> <li>• Accommodation management: Hotel and rooms division operation, identification, description and rating of accommodation establishments.</li> <li>• Regulations and guidelines on housekeeping equipment, materials and their selection and maintenance.</li> <li>• Housekeeping staffing and responsibilities.</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Explain the different facets of the hospitality industry and link with Tourism</li> <li>▪ Explain concepts associated with hospitality services, with emphasis on accommodation and housekeeping.</li> <li>▪ Understand the importance/relevance of other subject matter areas such as interior design, cultural knowledge and understanding, and human resource management skills, to hospitality services</li> <li>▪ Identify the important role of service in the hospitality industry</li> <li>▪ Incorporate tourism aspects into hospitality services</li> <li>▪ Identify and describe the various departments associated with rooms division</li> <li>▪ Describe the maintenance and cleaning of furniture, surfaces and supplies.</li> <li>▪ Describe various positions within the establishment and explain procedures to be followed in the recruitment, interviewing and training of staff.</li> <li>▪ Explain how to market an establishment and deliver continuous guest satisfaction.</li> <li>▪ Have knowledge on the planning and managing of a guesthouse.</li> </ul>
<b>Assessment</b>	Formative assessment: 40% (Class tests 20%, portfolio 5%, practical assignments 5%, field visits reports 5%, oral presentation & group work. 5%). Summative assessment: 3 hour final examination=60%, subminimum of 40%
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance at lectures, practical's, tutorials

<b>Title</b>	<b>Experiential Learning in Hospitality</b>		
<b>Code</b>	<b>4CHT319</b>	<b>Department</b>	<b>Consumer Science</b>
<b>Prerequisites</b>	4CFD212	Co-requisites	4CFD311, 4CHT322, 4CHT332
<b>Aim</b>	Enable students to apply and relate various content areas of hospitality and tourism to relevant occupational experiences.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Critique a food service unit layout, menu planning.</li> <li>• Engage/ observe the planning and management of accommodation establishments.</li> <li>• Analysis and evaluation of various lodging operations</li> </ul>		



	<ul style="list-style-type: none"> <li>• Evaluate purchasing, receiving and storage inventory, work in food production and service unit.</li> <li>• Participate/observe various elements of effective front office management with emphasis on administrative skills, systems and documentation.</li> <li>• Observe/practice the use of software package for front office operations.</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate understanding of the agency's organizational structure, means of operation, rules and procedures.</li> <li>▪ Demonstrate the ability to work in a team.</li> <li>▪ Acquire organizational and coordinating skills.</li> <li>▪ Demonstrate the use of oral and written communication skills.</li> </ul>
<b>Assessment</b>	Fieldwork preparation workshops 20% Field experience: Work integrated learning report 60% Oral assessment 20% 40% subminimum in all assessments
<b>DP Requirement</b>	80% Attendance of fieldwork preparation workshops.

<b>Title</b>	<b>Hospitality Service Operations</b>		
<b>Code</b>	<b>4CHT322</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisite</b>	4CHT111	Co-requisite	4CHT319, 4CFD222, ARTO221, ARTO222
<b>Aim</b>	An study of the development, marketing and management of accommodation and food service operations, with emphasis on identifying opportunities and developing ideas for establishing a guesthouse/B&B and a food and beverage service operation.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• The following as applied to accommodation and food service operations: <ul style="list-style-type: none"> <li>• Planning, establishing, marketing and operating,</li> <li>• Developing a service culture and dealing with guests,</li> <li>• Front-of-the-house and back-of-the-house operations,</li> <li>• Staffing – job descriptions, selection and training,</li> <li>• Cultural uniqueness; Services rendered by establishments, e.g. events</li> <li>• Meeting hospitality industry requirements; Ensuring health, hygiene and safety,</li> <li>• General, financial and human resource management,</li> <li>• Exterior and interior planning and selection and maintenance of finishes, furniture, equipment and accessories,</li> <li>• Entrepreneurship: Planning, establishing, marketing and operating a guesthouse/B&amp;B and a restaurant/other food service operation.</li> </ul> </li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Understand the importance/relevance of other subject matter, such as interior design, cultural knowledge and understanding, financial management, etc. to hospitality services;</li> </ul>		

	<ul style="list-style-type: none"> <li>Explain how to plan, establish, market and operate an establishment; Identify the important role of service in the hospitality industry and explain how to deal with guests and provide outstanding service.</li> <li>Identify and describe front-of-the-house and back-of-the-house operations.</li> <li>Explain how to achieve cultural uniqueness while meeting requirements.</li> <li>Describe various positions within the establishment and explain procedures to be followed in the recruitment, interviewing and training of staff.</li> <li>Describe the maintenance and cleaning of furniture and surfaces.</li> <li>Demonstrate knowledge of general, financial and human resource management.</li> <li>Display the ability to apply knowledge on principles of exterior and interior planning and selection and maintenance of finishes, furniture, equipment and accessories</li> <li>Apply knowledge in the development of a plan for the establishing, marketing and operating of an accommodation and food service establishment</li> </ul>
<b>Assessment</b>	Formative: Continuous assessment, 40% (tests, assignments and presentations) Summative: 3-hour final examination, 60% 40% subminimum in all assessments
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance at lectures, practical's/tutorials

### INTERNSHIPS

<b>Title</b>	<b>Internship for Extension and Rural Development</b>		
<b>Code</b>	<b>SCIN419</b>	<b>Department</b>	<b>Consumer Science</b>
<b>Prerequisites</b>	ADEV211, ADEV222, 4AAE211	Co-requisites	4CNS312,4CRM311
<b>Aim</b>	Enable students to apply and relate various content areas of rural development to relevant occupational experiences.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Community needs assessment, planning for appropriate interventions, meeting basic needs of the vulnerable.</li> <li>Identify and assess resources of families, communities and those of the agency and make effective use of these to promote the welfare of the community.</li> <li>Apply consumer science principles from the various content areas in providing education to families and communities</li> <li>Understand and work with community leadership and other community structures. Management of community projects from planning, implementation, monitoring and evaluation, community work roles and skills.</li> <li>Participate in community based income generation projects.</li> </ul>		

	<ul style="list-style-type: none"> <li>• Participate in a team with the community to develop appropriate techniques and tools in relation to food, clothing, housing.</li> <li>• Provide consumer education to various audiences in the community.</li> <li>• Plan and participate in awareness campaigns e.g. Identify a specific community group or project and propose a skills development related intervention.</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate understanding of the agency's organizational structure, means of operation, rules and procedures.</li> <li>▪ Demonstrate the ability to work in a team.</li> <li>▪ Acquire organizational and coordinating skills.</li> <li>▪ Profile a community.</li> <li>▪ Demonstrate the use of oral and written communication skills.</li> </ul>
<b>Assessment</b>	Fieldwork preparation workshops 20% Field experience Work integrated learning report 60% Oral assessment 20% 40% subminimum in all assessments
<b>DP Requirement</b>	80% Attendance of fieldwork preparation workshops.

### CONSUMER SCIENCE

<b>Title</b>	<b>Household And Consumer Studies</b>		
<b>Module Code</b>	<b>4CNS111</b>	<b>Department</b>	<b>CONSUMER SCIENCES</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim/Purpose</b>	To provide basic understanding of the profession and the mission statement of Consumer Sciences; and relevant theoretical perspectives and to develop critical thinking; analytical and problem-solving skills		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Definition of concepts; the mission of consumer studies; careers and areas of study in Consumer Sciences.</li> <li>• The concept consumer and consumer rights; an ecosystems framework and other theoretical approaches to studying the family.</li> <li>• Households; family forms and structures.</li> <li>• Roles and functions of the family.</li> <li>• Relationships across the family life cycle.</li> <li>• Social and developmental changes within the family and the profession.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Develop an understanding of the mission and concerns of Consumer Science</li> <li>▪ Examine and explain the historical development of the profession and developmental changes through the years</li> <li>▪ Identify career opportunities and recognize the interdisciplinary nature of Consumer Science</li> <li>▪ Examine the theoretical frameworks central to the study of the family.</li> <li>▪ Identify linkages between the family and other institutions or systems.</li> <li>▪ Analyse the different family forms and structures.</li> </ul>		

	<ul style="list-style-type: none"> <li>▪ Illustrate the boundaries of marital, family and kinship organization.</li> <li>▪ Analyse social and developmental changes within the family.</li> <li>▪ Examine marital instability, family crisis, violence and coping strategies.</li> <li>▪ Participate in group tasks and work cooperatively in teams</li> <li>▪ Communicate effectively, orally and in written form.</li> </ul>
<b>Assessment</b>	Formative: 40% Continuous Assessment Mark (class tests 20%, assignments 10%, End notes or one minute papers 5%, class presentations 5%) Summative: 60% 3 hour final examination
<b>DP Requirement</b>	Subminimum: 40% Continuous Assessment Mark 80% Attendance of lectures and tutorials/practical's

<b>Title</b>	<b>Household Resource Management</b>		
<b>Code</b>	<b>4CNS211</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisite</b>	4CNS111	Co-requisite	None
<b>Aim</b>	The module seeks to provide students with a comprehensive education in household resource management which includes household/family financial management and management of community resources.		
<b>Content</b>	Concepts underlying household, decision making and management of resources; an analytical approach to family financial planning; the family as a producing and consuming unit including the decision-making processes and links between economic and social issues; Management of family financial resources; review of practical money skills including budgeting, credit management, savings and investments; development of a comprehensive family financial plan		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Develop an understanding of the concepts underlying household management of resources.</li> <li>▪ Review the theories of consumer and household decision making</li> <li>▪ Analyse and describe the systems and management approaches through practical application</li> <li>▪ Describe the relationship between needs, values, goals and standards and their influence on management.</li> <li>▪ Identify household and individual needs, values, goals and standards</li> <li>▪ Classify and describe characteristic of resources and identify individual and household access to resources.</li> <li>▪ Demonstrate an understanding of planning and implementation of plans practically.</li> <li>▪ Develop an understanding of financial planning, and importance of investments and savings.</li> <li>▪ Develop research and report writing skills</li> <li>▪ Communicate effectively, orally and in written form.</li> </ul>		
<b>Assessment</b>	Formative: 40% continuous assessment (Class tests; assignments; oral presentations; portfolio) Summative: 60% 3-hour final examination		

	40% subminimum in all assessments
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical's/tutorials

<b>Title</b>	<b>Consumer and the market</b>		
<b>Code</b>	<b>4CNS212</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	To introduce students to the basic concepts of marketing, consumer behavior, consumer decision making, consumer rights and responsibilities, money management and consumer education as applied in the buying of goods and services.		
<b>Content</b>	<ul style="list-style-type: none"> <li>● Introduction to marketing – approaches and principles</li> <li>● The role of the marketer – planning and research</li> <li>● The market – segmentation, targeting and positioning</li> <li>● Marketing mix – product, price, place and promotion</li> <li>● Consumer behavior – the effect of individual and environmental factors.</li> <li>● Consumer decision making – the process and its application</li> <li>● Consumer education – an introduction to the economic system</li> <li>● Consumer rights and responsibilities; Consumer problems, addressing protection</li> <li>● Money management – budgeting, tax, saving, investment and credit</li> <li>● Buying goods and services – buying food, shelter, clothing, transport, furniture and equipment; and acquiring professional services.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Define concepts related to marketing, consumer behavior and education.</li> <li>▪ Describe the marketing process, compare various marketing approaches and discuss the principles of marketing; Define marketing planning and explain the steps in the planning process; Define marketing research and explain how it should be done.</li> <li>▪ Explain the necessity for and importance of market segmentation, describe methods of segmenting and criteria for successful segmentation.</li> <li>▪ Identify and describe individual and environmental factors affecting cons. behavior.</li> <li>▪ Describe steps in decision making and apply to purchasing of goods and services</li> <li>▪ Demonstrate knowledge of responsible consumer practices and effective management of the consumer role.</li> <li>▪ Evaluate consumer problems, needs and issues and make contributions to solve problems, meet needs and resolve issues to improve quality of life.</li> <li>▪ Develop relevant material to be used in consumer education.</li> <li>▪ Demonstrate the ability to make knowledgeable consumer choices relating to food, clothing, furnishings, shelter etc.</li> </ul>		

<b>Assessment</b>	Formative: Continuous assessment, 40% (tests, assignments and presentations) Summative: 3-hour final examination, 60% 40% subminimum in all assessments
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and practical's/tutorials

<b>Title</b>	<b>Gender, development and technology</b>		
<b>Code</b>	<b>4CNS312</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisite</b>	4CNS211	<b>Co-requisite</b>	None
<b>Aim</b>	The module will introduce students to contemporary issues and theory surrounding gender planning and explore the relationship between gender development and technology. The module will examine the impact of development and technological interventions and the subsequent patterned change in the areas of division of labour and rights over resources. Focus will also be given to resource use and allocation and sustainable development		
<b>Content</b>	Definition of concepts such as gender, gender equality, appropriate technology, livelihood, poverty, development; gender roles, the family and household; practical and strategic gender needs, approaches to women in development; gender issues in the work environment; the gender planning process and training strategies; Women's organizations; characteristics and choice of appropriate technology; appropriate technology, Indigenous Knowledge Systems and sustainable development; rural livelihoods & diversity; poverty, development & gender; rural households & HIV/AIDS.		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Develop an understanding of basic concepts such as gender, equality, equity etc.</li> <li>▪ Identify gender, development and poverty topics, review literature and compile written reports; Interpret and evaluate research on gender, development and poverty</li> <li>▪ Exposure to debate on gender in relation to development and technology</li> <li>▪ Describe household livelihood generation, and analyse the dimensions of livelihood</li> <li>▪ Understand, analyse &amp; describe events/actions around gender, poverty &amp; development</li> <li>▪ Introduce and explore the concept appropriate technology and its impact on development and capacitation of women.</li> <li>▪ Review gender dynamics and appropriate technology for empowering rural women</li> <li>▪ Develop knowledge and skills in many technological areas such as designing and making equipment for food processing, storage, measuring and other form of equipment using inexpensive and locally available materials.</li> <li>▪ Demonstrate knowledge and skills in the use of appropriate technology.</li> <li>▪ Produce and present a completed final and practically tested product.</li> <li>▪ Understand the impact of HIV/AIDS on rural household with special reference to women: demographics, socio-economic and socio-cultural.</li> </ul>		

	<ul style="list-style-type: none"> <li>Develop research and report writing skills; Communicate effectively, orally and in writing</li> </ul>		
Assessment	Formative: 40% Class tests; assignments; portfolio, presentations Summative: 60% 3-hour final examination 40% subminimum in all assessments		
DP Requirement	40% continuous assessment mark 80% Attendance of lectures and tutorials/practical's		
<b>Title</b>	<b>Management of Community Programmes</b>		
<b>Code</b>	<b>4CNS412</b>	<b>Department</b>	<b>Consumer Science</b>
<b>Pre-requisite</b>	4CNS211	Co-requisite	None
<b>Aim</b>	Develop skills in providing programmes and extension services (to include knowledge and skills transfer) for the purposes of community development. The focus is on planning and design, implementation and evaluation of such programmes. Understand and use community development principles to effectively communicate with individuals and communities.		
<b>Content</b>	Concepts: community, community development, rural development, extension. Understanding the community; adult education, Non- formal education and adult learning characteristics and how these are linked to community development. Principles of community development, Social, political, cultural, technological and environmental context within which community programmes are planned Design and implementation of nutrition programmes Community participation in development planning Importance of Needs assessment and strategies to determine needs. Participatory Rural Appraisal Use of groups (Vs individuals) in community development. Multisectoral approaches in programme management Principles and practices of successful nutrition programmes Planning, implementation, monitoring and evaluation of nutrition projects.		
<b>Outcomes</b>	It is expected that by the end of the module, the student will be able to; <ul style="list-style-type: none"> <li>Discuss community development and the role of extension service</li> <li>Understand the social, political, cultural, technological and environmental context within which community programmes are planned</li> <li>Discuss and apply the principles of community development</li> <li>Understand the purpose and methods of needs assessment in programme planning</li> <li>Determine the project planning cycle and steps involved</li> <li>Use knowledge and skills learnt to plan a community programme or project of their choice</li> <li>Familiarise with participatory methods of reaching or interacting with communities for their own development</li> </ul>		
<b>Assessment</b>	Formative: Assignments, tutorials, presentations and class tests (40%); Summative: 3-hour examination (60%). 40% subminimum in all assessments		
<b>DP Requirement</b>	40% Continuous assessment mark. 80% Attendance at lectures and practical's/tutorials		

## NUTRITION

<b>Title</b>	<b>Introduction to Nutrition</b>		
<b>Code</b>	<b>4CNU112</b>	<b>Department</b>	<b>Consumer Science</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim/Purpose</b>	To give students an in depth understanding of: Energy, macronutrients and micronutrients and dietary standards		
<b>Content</b>	<ul style="list-style-type: none"> <li>• A review of; Macronutrients, Energy, Micronutrients – vitamins and minerals, - description, functions, food sources and deficiencies.</li> <li>• Digestion and Absorption of macronutrients and micronutrients</li> <li>• Food choices, food habits, food composition, standards of nutrient intake (Dietary reference intakes (DRI's) - Estimated Average Requirements (EAR's), RDA's, Adequate intakes (AI's) and Tolerable Upper Intake Levels (UL's) and a comparison of dietary guidelines.</li> <li>• Nutrient analysis tools: Use of Food composition tables, Food Quantities manual, Food exchanges.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Explain functions, sources and deficiency diseases related to macronutrients</li> <li>▪ Classify micronutrients, sources, functions and deficiency diseases. Describe the sources and role of fibre in the human body.</li> <li>▪ Describe influencing factors on food choices of major groups and specific cultures in South Africa.</li> <li>▪ Apply standards of nutrient intake in dietary planning. Compare standards with analyzed diets.</li> <li>▪ Discuss food guides in Nutrition education – food groups, food pyramid, mixed meal guide and their shortcomings,</li> <li>▪ Analyse and evaluate dietary guidelines in developed and developing communities.</li> <li>▪ Plan and analyze given meals using the exchanges.</li> </ul>		
<b>Assessment</b>	Formative: 40% Continuous Assessment Mark (20% tutorial assessments; 20% Interim test; Summative: 60% Final examination =3 hours		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical and lectures		

<b>Title</b>	<b>Nutrition in the Lifecycle</b>		
<b>Code</b>	<b>4CNU211</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisites</b>	4CNU112	Co-requisites	None
<b>Aim</b>	To introduce students to physiological changes and accompanying nutrient requirements throughout the lifecycle, prevalent nutritional problems and their management.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Review of nutrient food sources and functions</li> <li>• Nutrition requirements in the lifecycle and physiological changes</li> <li>• Prevalent nutrition disorders and solutions throughout the</li> </ul>		



	lifecycle <ul style="list-style-type: none"> <li>• Protein-energy malnutrition (PEM)</li> <li>• Micro-nutrient deficiencies, nutrition and HIV/AIDS</li> <li>• Over-nutrition and lifestyle diseases</li> <li>• Nutrition and alcoholism</li> <li>• Dietary guidelines; nutrition misinformation and food labeling and conveying of nutritional messages.</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Develop an understanding of the physiological changes that occur in infancy, childhood, adolescence, pregnancy, adulthood and old age and the nutrient requirements that accompany such changes.</li> <li>▪ A demonstrable ability to plan meals to meet the nutrient requirements of all lifecycle stages.</li> <li>▪ A demonstrable ability to educate about and advocate for breastfeeding; assess the nutritional status of infants and children; ability to plan meals for the alleviation of prevalent nutrition disorders such as micro-nutrient deficiencies; PEM; and other forms of under-nutrition and over-nutrition; ability to advise and plan meals for individuals with HIV/AIDS</li> <li>▪ An understanding of the relationship between alcoholism and nutrition and alcohol intake and pregnancy, and how to prevent anomalies arising from each relationship.</li> <li>▪ An understanding of the relationship between nutrition and dental health.</li> <li>▪ Evaluate diet histories according to the prudent diet guidelines and through the use of exchanges.</li> <li>▪ Distinguish between reliable sources of nutritional information and unreliable sources; Develop an ability to read and interpret food labels</li> </ul>
<b>Assessment</b>	Formative: Continuous assessment, 40% (class tests, assignments and reports, and oral and visual/poster presentations) Summative: 3-hour final examination, 60% (subminimum 40%) 40% subminimum in all assessments
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and practical's/tutorials

<b>Title</b>	<b>Community Nutrition and Food Security</b>		
<b>Code</b>	<b>4CNU311</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisite</b>	4CNU112	<b>Co-requisite</b>	None
<b>Aim</b>	To enable students to gain an in-depth understanding of nutrition and food security policies and programs and to identify gaps that exist between policy and implementation. The module also aims to introduce students to various methods of assessing the nutritional status of individuals and communities and nutrition intervention strategies. Students will learn to integrate food security policies into nutrition intervention programs		
<b>Content</b>	Community nutrition concepts and theoretical frameworks on working with communities; nutrition and food security policy evaluation;		

	Nutrition assessment methods and intervention strategies: nutrition including food supplementation and enrichment programs. Integrated Nutrition Programmes with special reference to: Food Supplementation and Fortification; Food security indicator; food availability, supply and access at household, national and international levels. Food security programs and environmental issues
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Develop an understanding of concepts related to community nutrition and food security.</li> <li>▪ Review the Universal Declaration of Human rights and the South African Constitution on the right to food and nutrition.</li> <li>▪ Examine the theoretical frameworks central to working with communities</li> <li>▪ Identify possible causes of malnutrition with reference to the UNICEF Model.</li> <li>▪ Critically evaluate nutrition and food security policies and programs.</li> <li>▪ Identify and examine the various methods used in assessing the nutritional status of individuals and communities</li> <li>▪ Review and develop nutrition intervention strategies</li> <li>▪ Identify and analyse the indicators of assessing food security at household and national/international levels.</li> <li>▪ Provide an in-depth understanding of the relationship between food security, nutrition and traditional knowledge</li> <li>▪ Develop research and report writing skills</li> <li>▪ Communicate effectively, orally and in written form.</li> </ul>
<b>Assessment</b>	Formative: 40% Class tests; assignments; oral/poster presentations, case studies; reports Summative: 60% 3-hour final examination 40% subminimum in all assessments
<b>DP Requirement</b>	40% continuous assessment mark 80% Attendance of lectures, tutorials/practical's

<b>Title</b>	<b>Nutrition Education &amp; Training</b>		
<b>Code</b>	<b>4CNU331</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisites</b>	4CNU211	Co-requisites	None
<b>Aim</b>	To provide students with research skills on how to explore, develop and evaluate nutrition education materials for different groups and also aims to equip students with information on the various strategies that could be used to change nutritional knowledge and habits/behavior of people.		
<b>Content</b>	Approaches and techniques for changing food and lifestyle habits. Research, development and evaluation of health/nutrition education materials for different groups.		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Gain knowledge and skills on the various approaches and strategies of behavioral change.</li> <li>▪ Be able to select the most appropriate mode of nutrition education for the target group.</li> </ul>		

	<ul style="list-style-type: none"> <li>▪ Understand cultural and ethical considerations and obtain skills that will assist them in determining how and what food habits to be improved.</li> <li>▪ Gain knowledge on the evaluation of nutrition education programs.</li> <li>▪ Understand the importance of team approach in nutrition education.</li> <li>▪ Identify individuals at risk for malnutrition through need assessment.</li> <li>▪ Be able to develop messages and materials for specific target group.</li> <li>▪ Develop demonstration skills.</li> <li>▪ Develop research and report writing skills.</li> <li>▪ Communicate effectively, orally and in written form.</li> </ul>
<b>Assessment</b>	Formative: Continuous assessment, 40% (class tests, assignments and projects, portfolio and oral and visual/poster presentations) Summative: 3-hour final examination, 60% 40% subminimum in all assessments
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and practical's/tutorials

## RESEARCH

<b>Title</b>	<b>Research Methods</b>		
<b>Code</b>	<b>4CRM311</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Pre-requisite</b>	None	Co-requisite	None
<b>Aim</b>	<p>To introduce students to the basic principles of research methods and its use in various job situations. Students are expected to demonstrate an understanding of the research concepts by describing them and applying research knowledge in problem solving exercises on the various research steps, and to equip students with necessary skills to:</p> <ol style="list-style-type: none"> <li>develop a research proposal and</li> <li>Collect, analyze and interpret data required for research.</li> </ol>		
<b>Content</b>	<p>Fundamentals of research, tools of research, review of literature. Types of research; quantitative and qualitative research designs. Data collection methods, to include questionnaire development. Sampling: role of sampling, type of sampling procedures or techniques.</p> <p>Fundamentals of statistics</p> <ul style="list-style-type: none"> <li>-Types of data or measurement scales</li> <li>- Discrete versus continuous variables</li> <li>- Independent versus dependent variables</li> </ul> <p>Distinguishing between descriptive and inferential statistics</p> <p>Descriptive statistics- Percentages and proportions, Frequency distributions, measures of central tendency- (mean, mode, median), standard deviation, Correlations .</p>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Discuss importance of research and the need for a scientific approach in acquiring knowledge;</li> <li>▪ Demonstrate ability to recognize/identify research problems</li> </ul>		

	<ul style="list-style-type: none"> <li>▪ Review and write a literature review related to an identified research topic</li> <li>▪ Determine appropriate sampling methods for various types of research;</li> <li>▪ Understand, design and apply appropriate data collection methods to identified research problem</li> <li>▪ Demonstrate understanding of research steps and apply these in development of a research proposal</li> <li>▪ Explain the role/importance of statistics in research</li> <li>▪ Explain and make sense of basic statistical concepts</li> <li>▪ Define what is meant by measures of central tendency and measures of variability</li> <li>▪ Understand the analysis and interpretation of data for research studies based on sample data collected.</li> </ul>
<b>Assessment</b>	Formative: Assignments, tutorials, presentations and class tests (40%); Summative: 3-hour examination (60%). 40% subminimum in all assessments
<b>DP Requirement</b>	40% Continuous assessment mark 80% Attendance in lectures and tutorial/practical's

<b>Title</b>	<b>Research Project</b>		
<b>Code</b>	<b>4CRM422</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Pre-requisite</b>	None	Co-requisite	4CRM311
<b>Aim</b>	To apply research skills gained to design and implement a research project on a selected topic in the major field of study. The module is intended to also test the students' ability to organize and interpret data collected and present the results in a research report.		
<b>Content</b>	Review of research methodology Planning a research project and implement according to research protocol: Review and refine problem statement, design, and sampling and data collection methods. Update review of literature. Design research instrument(s). Preparing for data collection and seeking for approval and related ethical considerations pertaining to the research Data collection, data cleaning, coding and analysis. Writing of research report.		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ -Identify a research problem within major field of study, based on identified need and feasibility of the project.</li> <li>▪ -Write a research proposal</li> <li>▪ -Design and execute independently a research project following the main research steps, as outlined in the proposal</li> <li>▪ -Communicate effectively, orally and in written form, to various people as part of executing the research project.</li> <li>▪ -Use the library effectively for background literature review</li> <li>▪ Demonstrate ability to process, analyse and present data collected</li> </ul>		

	<ul style="list-style-type: none"> <li>-Produce a concise but well written professional report that presents the research work undertaken. The usual components of a research report are expected.</li> </ul>
<b>Assessment</b>	Formative: Each step of the research process (Proposal, design of data collection instrument, chapter 1, 2, 3 and 4) constitutes work to be assessed as assignments (40%); Summative: Marking of full research report and oral presentation. (60%). Subminimum of 40% in assessments
<b>DP Requirement</b>	80% Attendance of fieldwork preparation workshops.

## CLOTHING AND TEXTILES

<b>Title</b>	<b>Clothing and textiles 1</b>		
<b>Code</b>	<b>4CTC212</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	To provide students with an introduction to textile products, its components, selection, use and maintenance and to introduce students to sewing equipment and basic sewing techniques and its use and application in the construction of interior components.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• The origin and properties of natural and man-made textile fibres.</li> <li>• Yarn and fabric construction methods and properties.</li> <li>• Finishing processes, color and design application.</li> <li>• Appearance, performance, maintenance and use of textile products.</li> <li>• Care equipment, products and procedures.</li> <li>• Introduction to equipment used in the construction of clothing and interior components; Introduction to hand and machine sewing techniques.</li> <li>• Application of sewing techniques in the construction of interior components e.g. bed linen, cushions, curtains, etc.</li> <li>• Requirements and costing of interior components</li> <li>• Planning and equipping a sewing area; The benefits of sewing for the home and industry; Evaluation of workmanship in the construction of interior components.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>• Differentiate between natural and man-made textile fibres.</li> <li>• Describe the properties of fibres and explain how these influence appearance, performance, durability and maintenance of textile products.</li> <li>• Describe yarn and fabric construction processes and explain how these influence appearance, performance, durability and maintenance of textile products.</li> <li>• Describe selected finishes and application of colour and design and explain how these influence appearance, performance, durability and maintenance of textiles.</li> <li>• Apply the above knowledge in the selection, use and care of textile products</li> <li>• Demonstrate correct use and control of sewing machine and other sewing and pressing equipment and identify and solve</li> </ul>		

	<ul style="list-style-type: none"> <li>basic stitching errors.</li> <li>Describe and correctly use sewing terms and symbols, knowing how and where these are used and follow basic sewing instructions.</li> <li>Determine requirements and estimate production cost.</li> <li>Apply basic hand and machine sewing techniques and demonstrate creativity in the production of selected soft furnishings and window treatments.</li> <li>Critically evaluate the quality of workmanship in interior components.</li> </ul>
<b>Assessment</b>	Formative: Continuous assessment, 30% (class tests and assignments) Practical work, 30% Summative: 3-hour final examination, 40% 40% subminimum in all assessments
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of lectures and practical's/tutorials

<b>Title</b>	<b>Clothing and textiles 2</b>		
<b>Code</b>	<b>4CTC312</b>	<b>Department</b>	<b>Consumer Sciences</b>
<b>Prerequisites</b>	4CTC212	Co-requisites	None
<b>Aim</b>	To introduce students to the social and cultural aspects of dress as non-verbal communicator, the development, production and marketing of fashion, and to equip students with skills used in clothing construction.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Dress as communicator.</li> <li>The fashion cycle, demand, change and research.</li> <li>The raw materials of fashion.</li> <li>Design and production of clothing and accessories.</li> <li>Wholesale fashion marketing and distribution.</li> <li>Fashion retailing and promotion.</li> <li>Body measurements, and basic size and fitting alterations.</li> <li>Maintenance of sewing equipment.</li> <li>Selection and use of commercial patterns.</li> <li>Characteristics, selection and garment construction using a variety of fabrics.</li> <li>Requirements and production cost of garments.</li> <li>Sewing as an income generation activity.</li> <li>Evaluation of workmanship in the construction of garments</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>Explain how dress communicates characteristics of individuals and groups.</li> <li>Demonstrate an understanding of fashion as a reflection of change.</li> <li>Knowledge of clothing categories, styles and price and size ranges.</li> <li>Understand the fashion cycle and knowledge of fashion adoption.</li> <li>Understand the marketing of fashion and explain the importance of fashion research.</li> <li>Describe the design and production of fashion</li> </ul>		

	<ul style="list-style-type: none"> <li>Describe the wholesale marketing and retail merchandising and promotion of fashion.</li> <li>Take accurate body measurements and adapt patterns and garments for perfect fit.</li> <li>Demonstrate the ability to operate and maintain sewing and pressing equipment.</li> <li>Select appropriate fabric for the construction of different garments.</li> <li>Determine the requirements and calculate the cost to construct garments.</li> <li>Correctly use a commercial pattern and follow garment construction instructions.</li> <li>Apply sewing techniques in the construction of garments.</li> <li>Explain how sewing can be used as an income generating activity.</li> </ul>
<b>Assessment</b>	Formative: Continuous assessment, 30% (class tests and assignments) Practical work, 30% Summative: 3-hour final examination, 40% 40% subminimum in all assessments
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and practical's/tutorials.

#### DIPLOMA IN HOSPITALITY MANAGEMENT

CODE	MODULE NAME	MODULE DESCRIPTION
<b>4HHC111</b>	Hospitality Communication	Hospitality Communication is an interactive course designed to help students learn the fundamentals of working in the hospitality industry by improving their communication, self-esteem and presentation skills. The module focuses on intercultural communication, applicable to South Africa, conflict management strategies and forms of business correspondence. Application of workplace scenarios are dealt with throughout the module.
<b>4HMI 111</b>	Hospitality Information Systems 1	The aim of this module is to skill students in computer literacy within Windows operating system, browser and word processor applications.
<b>4HMP111</b>	Hospitality Operations I	The aim of this module is to introduce students to the scope of the hospitality industry as well as the organisation and structures of hospitality establishments. The module will also provide an overview of aspects of rooms division management, food service, lodging and hospitality careers.
<b>4HMG111</b>	Hotel Health and Safety	Hotel Health and Safety gives students a broad look at the different aspects of health and hygiene in the hospitality industry. The module aims to equip students with theoretical and practical knowledge of

		hazards, micro-organisms, fire safety and basic first aid as required in the hospitality industry.
<b>4HMB111</b>	Food and Beverage Studies 1	The important link between food and beverage service in the hospitality industry cannot be denied. This module provides students with technical skills of set-up and serving as well as theoretical knowledge of the necessary attributes of staff, tea and coffee service and sectors of the hospitality industry.
<b>4HMC111</b>	Culinary Studies 1	This course covers culinary theory, practices and principles. Learners are introduced to tools and equipment and mise-en-place in the kitchen. It focusses on theory, practices and principles of knife skills, dry heat cooking methods, microwave cooking and the use of flavours and flavourings in food fabrication. Hands-on kitchen laboratory experiences introduce the students to basic baking, stocks & soups, eggs, dairy and poultry preparation. Introduction to breakfast cookery is also included.
<b>4HMI112</b>	Hospitality Information systems 2	The aim of the module is to equip students with basic computer literacy skills in presentation and spreadsheet applications.
<b>4HMG112</b>	Nutrition	The module provides the students with a foundation of nutritional principles applied in the food and beverage service operations. The content of the module focuses on the menu choices for various ethnic groups and religions. It also places an emphasis on diet and diseases as well as implementation of good nutritional principles during food preparation.
<b>4HMM112</b>	Hospitality Management 1	This module introduces the student to the core concepts, principles, theories and practices of effective management essential to the successful operation of an enterprise in the hospitality industry.
<b>4HMC112</b>	Culinary Studies 2	This course builds on the theory and practices learned in Culinary Studies 1. Hands-on kitchen laboratory experiences introduce the student to moist heat cooking methods, knife skills, classical cookery methods in sauces, salads, sandwiches, quick breads, vegetables and starch preparation. Emphasis is placed on plate presentation.
<b>4HMG122</b>	Service Excellence	The aim of this module is to enlighten students on the importance of service excellence as well as a practical application of how to provide excellent service in all hospitality related environments as service excellence leads to customer satisfaction and loyalty, ultimately promoting the success of the business.
<b>4HMF112</b>	Hospitality Financial Management 1	After completing this module, students should be able to articulate the nature of financial management and its importance in the hospitality industry context. They



		will use the trial balance and prepare a basic income statement and balance sheet in the prescribed format evidencing correct classification of transactions and balances and incorporating accurate calculations. Basic vertical, horizontal and ratio financial analysis of the income statement and balance sheet and the interpretation of the outcome of each analysis will also be performed. A three-month cash budget and the articulation of the importance of working capital management in the hospitality industry will be performed and emphasised.
<b>4HMP212</b>	Hospitality Operations II: Front Office	Front office is often the initial point of physical contact between the customer and the hospitality unit. As a Hospitality professional, students will be required to display knowledge and skills essential to the efficient functioning of this department.
<b>4HMG211</b>	Hospitality Behavioural Studies	This module will introduce students to the field of consumer behaviour with specific reference to the hospitality industry. This module aims to enlighten students on decision-making processes of consumers and factors that may influence these decisions.
<b>4HMM211</b>	Hospitality Management II	This module presents a systematic approach to human resource management in the hospitality industry, focusing on the staffing and function of management. This module is designed to provide students with an understanding of the importance of human resource management in the hospitality industry.
<b>4HML211</b>	Hospitality Law 1	The purpose of the module is to present the history of South African Law and laws which are commonly used in hotel, restaurant, transport and travel services as well as the regulatory instruments that support effective management of the hospitality industry. The module focusses mainly on the law of contract, law of delict and commercial contract. It also develops the students' understanding of key aspects of these laws including how sales contracts are formulated, rights of the parties and liabilities.
<b>4HMC221</b>	Culinary Studies 3	The module builds on the theoretical and practical knowledge gained in the first year. Plate presentation, service styles, menu planning and evaluation is emphasised. Additional culinary skills and techniques such as yeast and gelatine work, meat, poultry, fish and shellfish are incorporated whilst building on the importance of team work, organisation and time management. The module aims to expose students to new cooking methods and ingredients to broaden their culinary horizons.

<b>4HGH111</b>	German Hospitality 1 for	The aim of this module is to learn basic communicational skills (listening, speaking, reading and writing) in everyday German. On completion of this module learners should be able to use every day conversational and communicative phrases, such as: general conversations about learners themselves and other people (e.g. greeting people, introducing yourself, saying where you come from and where you live), conversations in a restaurant/café/hotel, booking a room, using numbers etc.
<b>4HMC222</b>	Culinary Studies 4	This Culinary Studies module focus on kitchen management and utilises the knowledge and practical experience gained in the previous culinary studies modules to challenge students to make use of what they have learned to put together their own balanced and theme-oriented menus for events. The students are then required to manage every aspect of the kitchen for an event including; ordering, preparation and service.
<b>4HMB212</b>	Food and Beverage Studies 2	The module is delivered in both theory and practical whereby students interact with the customers on a regular basis. Students are equipped with skills on serving meals and beverages (alcoholic and non-alcoholic). Learners will learn to apply different serving and clearing techniques. It also gives student a basic knowledge of international wines, law and wine tasting.
<b>4HGH112</b>	German Hospitality 2 for	The aim of this module is for learners to build on the knowledge and language skills that they have acquired during the first semester. This will include conversations in a restaurant/ café/ hotel, asking for and giving directions, buying things in shops, etc. Learners will need to know simple grammatical structures and vocabulary that will enable them to construct their own dialogues and interact in a simple way provided the person talks slowly and clearly.
<b>4HHM212</b>	Events Management	This module is designed to introduce students to the planning and management of special events. This highly interdisciplinary course addresses the systems, tools and checklists necessary for successful event planning. Students learn the principles of marketing as applied in the events management industry.
<b>4HML311</b>	Hospitality Law 2	The module introduces the basic framework of consumer, liquor, food as well as labour legislations and how such laws are enforced. Laws which are applied when opening a hospitality business is emphasised. The module also provides focus on how the law protects the consumer/employee in everyday transactions.

<b>4HMF311</b>	Hospitality Financial Management 2	Hospitality Financial Management 2 revises the performance of basic financial statement analysis with a view to understanding business performance and position. Strategies for business growth and the associated costs thereof, as well as working capital management techniques are covered. Net Present Value and payback period investment analysis methods are used to evaluate investment opportunities and students are taught to compile a business plan which includes a financial budget.
<b>4HMM311</b>	Hospitality Management 3	The module entrepreneurship focuses on the practical and personal development aspects of starting a new venture. The module presents the concept of entrepreneurship opportunities; discoveries; value creation; customer and market orientation and development; basic feasibility analysis; preparing the marketing and sales; business modelling as well as business planning and analysis. As part of this module, students are expected to organise a seminar on entrepreneurship with the aim of attracting local entrepreneurs and business owners who assist in assessing the quality of the business idea and plan.
<b>4HMP311</b>	Hospitality Operations 3	This module studies the impact of facility design on facility management. Facility systems include safety & security systems; water and wastewater systems; HVAC systems; lighting systems; laundry system as well as food service equipment.
<b>4HMI311</b>	Hospitality Information Systems 3	This module introduces the computer systems in the hospitality industry and the practical application of these systems.
<b>4HMG312</b>	Work Integrated Learning	This module builds on the knowledge and skills gained during the programme. It integrates theory and practice in learning. Students work in a fully operational hospitality organisation for a period of six (6) months.

Degree-specific Rules – According to rules as specified by Faculty of Science & Agriculture

**STAFF**

Professors	Vacant
Senior Lecturer	ML Mdoka, BScHons (Applied Physics, NUST), GradDip Meteorology (Australia), MSc (Climatology), PhD (Climatology) (UCT) I Moyo BAHons, GRAD CE (Zim), MA, PhD (UNISA) NB Mbatha BSc (Physics & Electronics) (UNIZULU), BScHons, MSc (Physics) (UWC), PhD (Atmospheric Physics) (UKZN) Sen.
Lecturers	AT Mthembu, BEd, BAHons, STD, MA (UNIZULU) NP Ndimande, BAHons (UNIZULU), MSc (Oklahoma State) S Xulu BScHons, PGCE (UNIZULU), MSc (SU), PhD (UKZN)
n-Gap Lecturer	Jabulile Mzimela BSc, BSc (Hons) MSc Environmental Science (cum laude), UKZN
Laboratory Assistant	LC Shongwe, BA (Enviro. Plan. & Dev.), BAHons (UNIZULU)
Administrator	D Khumalo, NSC (Swinton Rd Col), BCom, BAHons (UNIZULU)

<b>Title</b>			
<b>Introduction to Physical and Environmental Geography</b>			
<b>Code</b>	<b>4GES111</b>	<b>Department</b>	<b>Geography &amp; Environmental Studies</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	This course introduces the student to man's physical environment i.e. earth's landform and atmospheric processes and environmental management. It provides the skills and knowledge to understand the global patterns and the natural processes involved in the landforms formation and the analysis of air temperature, atmospheric moisture and precipitation, wind and global circulation and weather systems. The course also introduces students to major environmental issues confronting the society.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Materials of the Earth's crust</li> <li>• The lithosphere and plate tectonics</li> <li>• Volcanic and tectonic landforms</li> <li>• Landforms of weathering and mass wasting</li> <li>• Landforms and rock structure</li> <li>• Landforms made by wind, waves and currents</li> <li>• Air temperature</li> <li>• Atmospheric moisture and precipitation</li> <li>• Winds and global circulation</li> <li>• Weather systems</li> <li>• Ethical and philosophical foundations of environmental management</li> <li>• Environmental problems</li> <li>• Land use planning and environmental management</li> <li>• Environmental management approaches</li> <li>• Case studies on environmental management</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments; 16% theory tests and 5% assignments/presentations/activities). 60% Formal end of module theory (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of theory and practical classes		

<b>Title</b>	<b>Introduction to Human Geography</b>		
<b>Code</b>	<b>4GES112</b>	<b>Department</b>	<b>Geography and Environmental Studies</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	This course covers two aspects of human geography namely cultural and tourism Geography. The course introduces the students to the discipline of human geography which deals with the various sub-disciplines which include population dynamics, cultural environments, spatial behaviour and urban geography. The course is intended to provide students with an awareness of the value of human geography as a discipline that aids understanding of the complex and ever-changing world. Tourism geography aims to provide knowledge and understanding of the long-term consequences of tourism development: the socio-cultural, economic and environmental impacts of tourism as well as the economics of the tourism industry.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Aspects to be studied will include:</li> <li>• Philosophies in geography</li> <li>• Population dynamics</li> <li>• Cultural geography</li> <li>• Geography of spatial behaviour</li> <li>• Urbanisation</li> <li>• Inequality within a state</li> <li>• Tourism Industry: planning and development</li> <li>• Tourism and Economic Development</li> <li>• Tourism development and the Environment</li> <li>• Social and Cultural Aspects of Tourism</li> <li>• Pro-Poor Tourism Strategies</li> </ul>		
<b>Outcomes</b>	On completion of this module the learners will be able to demonstrate: <ul style="list-style-type: none"> <li>▪ Understanding of various philosophies of geography</li> <li>▪ A sound knowledge of sub-disciplines of geography which include population, cultural, behavioural and urban geography.</li> <li>▪ An understanding of tourism development and its impact on the environment.</li> <li>▪ A sound knowledge of pro-poor tourism strategies.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (16% practical assessments; 10% theory tests; 10% term project and 5% assignments/presentations/activities). 60% Formal end of module theory (2 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of theory and practical classes		

<b>Title</b>	<b>4GES211: Global landforms and Cartography</b>		
<b>Code</b>	<b>4GES211</b>	<b>Department</b>	<b>Geography and Environmental Studies</b>
<b>Prerequisites</b>	4GES111	Co-requisites	None
<b>Aim</b>	The course covers two areas: geomorphology and cartography. The geomorphology part of the module deals with forces and processes involved in the formation of landscape on a global and local scale. The forces and processes are studied in terms of their spatial distribution and their respective		

	intensities. Resultant landforms are noted and classified according to physical form, regional distribution, and the types of processes involved. Environmental implications of the processes and forms are considered. The cartography part of the module deals with the factual basis for making decisions concerning the design and interpretation of maps. The module is designed to stimulate interest in cartographic issues that play an important role in the various fields of study.
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ On completion of this module the learners will be able to:</li> <li>▪ Distinguish the approaches to geomorphology</li> <li>▪ Evaluate the processes contributing to the different types of landforms</li> <li>▪ Identify drainage basin characteristics</li> <li>▪ Design and interpret maps</li> <li>▪ Describe map projections</li> <li>▪ Describe Geographic Information System</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments; 16% theory tests and 5% assignments/presentations/activities). 60% Formal end of module theory (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of theory practical classes

<b>Title</b>	<b>4GES212: Demographics, Health and Sustainable Development</b>		
<b>Code</b>	<b>4GES212</b>	<b>Department</b>	<b>Geography and Environmental Studies</b>
<b>Prerequisites</b>	4GES122	Co-requisites	None
<b>Aim</b>	This course intends to introduce students to concepts, principles and challenges in the field medical geography and sustainable development. Students are to examine the relationships between the environment, health and sustainable development. Its main objectives are: (1) to improve students' ability to think critically, read closely and to argue well about environmental, demographics and health issues and sustainable development, (2) to introduce students to some text and major controversies on environmental issues and developmental issues and (3) to help students in arriving at their own rational and clear minded views about matters under discussion.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Aspects to be studied will include:</li> <li>• Introduction to medical geography</li> <li>• Diseases of poverty</li> <li>• Population distribution in South Africa</li> <li>• Social and spatial inequalities in health</li> <li>• Distribution of diseases and provision of health care services</li> <li>• Health status in South Africa</li> <li>• Introduction to sustainable development</li> <li>• Sustainable development, poverty and the environment</li> <li>• Natural resources and sustainable development</li> <li>• Sustainable development in Africa: A challenge for the 21<sup>st</sup> century</li> <li>• Sustainable development in rural South Africa</li> <li>• Globalization and sustainable development</li> <li>• The sustainable development strategy of South Africa</li> </ul>		

<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments; 10% theory tests and 10% assignments/presentations/activities). 60% Formal end of module theory (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of theory and practical classes

<b>Title</b>	<b>4GES 222 Hydrometeorology</b>		
<b>Code</b>	<b>4GES 222</b>	<b>Department</b>	<b>Geography and Environmental Studies</b>
<b>Prerequisites</b>	4GES 111	Co-requisites	None
<b>Aim</b>	<p><i>This course covers the occurrence and movement of energy and water vapour fluxes in the atmosphere and on the land surface, develops quantitative approaches for measurement of the surface energy fluxes and evapotranspiration using various hydrometeorological methods, and discusses the measurement and processing of data sets necessary for hydrologic modelling. The module aims at acquainting students with the nature of climate in the boundary layer and the region in which the energy that drives atmospheric processes originate, and also where we live, produce our food and release the bulk of the atmospheric pollution). Energy and mass fluxes as well as atmospheric interactions producing distinctive weather patterns and/or climates in the boundary layer are discussed. Also covered are the various methods for the estimation/measurements of the surface fluxes. The knowledge gained in this module is essential and finds application in agricultural, environmental and water resources studies, among others.</i></p>		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction (radiation laws, radiant flux, insolation determination, - radiation and energy budget)</li> <li>• Energy and mass exchanges; Subsurface climates (soil heat flux and soil temperature, -soil water flow and soil moisture)</li> <li>• Surface layer climates (momentum flux and wind, sensible heat flux and air temperature, latent heat flux and water vapour)</li> <li>• Outer layer climates</li> <li>• Evaluation of energy and mass fluxes (radiative fluxes (measurement and theoretical approaches), convective fluxes , - water balance)</li> <li>• Energy balance of non-vegetated surfaces; Climates of vegetated surfaces Climates of non-uniform terrain (spatial inhomogeneity and topographic effects) Man-modified atmosphere (shelter effects, greenhouse)</li> <li>• Unintentionally-modified climates</li> <li>• Estimation of surface fluxes (methods and instrumentation) (eddy covariance, Bowen ratio-Energy balance, scintillometry, surface renewal Penman-Monteith</li> <li>• Evapotranspiration and water loss from various surfaces</li> <li>• Application of remote sensing in surface fluxes estimations</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments; 16% theory tests and 5% assignments/presentations/activities). 60% Formal end of module theory (3 hours)		

<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of theory and practical classes
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<b>Title</b>	<b>4GES311: Urban environment and Recreation Planning</b>		
<b>Code</b>	<b>4GES311</b>	<b>Department</b>	<b>Geography and Environmental Studies</b>
<b>Prerequisites</b>	4GES212	Co-requisites	None
<b>Aim</b>	<p>This course addresses spatial and development problems that were created by Apartheid planning policies. Apart from studying strategies for integrating the fragmented South African cities, the module goes further and interrogates the concept of integrated settlement planning. The module enquires if this concept is appropriate within the present socio-economic environment. The module also addresses the concept of recreation spaces. Special attention will be given to the connection between recreation planning and other types of planning and environment design, describe alternative approaches to recreation planning and how, where and when these approaches can be used. Students are expected to be able to make meaningful contributions towards shaping a South African city that is integrated and offers more opportunities of economic advancement to its residents</p>		
<b>Content</b>	<ul style="list-style-type: none"> <li>Aspects to be studied will include:</li> <li>Introduction to urban and regional planning</li> <li>Urbanization, unemployment and philosophical approach to urban management and job creation</li> <li>Urban development and economic integration</li> <li>Structuring elements of settlements, Urban nodes, Activity corridors, A metropolitan open space system</li> <li>Housing, integration of urban development and the compact city debate</li> <li>Unravelling the different meanings of integration: The Urban Development Framework of the SA government</li> <li>Planning for integration: The Case of the Metropolitan Cape Town</li> <li>Alternative Urban Planning and Management in Brazil: Instructive examples for other countries in the South</li> <li>Interpretation of sustainable development and urban sustainability in low-cost housing and settlements in South Africa</li> <li>Introduction to Recreation Planning; Concepts and Principles; Benefits of recreation</li> <li>Recreation Supply and Demand analysis</li> <li>Strategic Plans</li> <li>Facilities Planning and Design</li> <li>Planning Methodology</li> <li>Coastal Recreation Planning and Design</li> </ul>		
<b>Assessment</b>	<p>40% Continuous Assessment Mark (20% practical assessments; 16% theory tests and 5% assignments/presentations/activities). 60% Formal end of module theory (3 hours)</p>		
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark 80% Attendance of theory and practical classes</p>		



<b>Title</b>	<b>4GES321 Atmospheric processes and pollution</b>		
<b>Code</b>	<b>4GES321</b>	<b>Department</b>	<b>Geography and Environmental Studies</b>
<b>Prerequisites</b>	4GES222	Co-requisites	None
<b>Aim</b>	This module is designed to enable students comprehend a wide range of weather-producing phenomena. It deals primarily with the environment of the southern hemisphere, and particularly the atmospheric phenomena affecting the weather and climate of southern Africa. It lays a foundation for specialised modules in climatology and applied climatology offered at senior and postgraduate levels of study. The objectives of this module will be met and tested through formal lectures, tutorials, practical sessions and two assessments.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Global and thermal circulations               <ul style="list-style-type: none"> <li>○ Large-scale pressure patterns and circulation systems</li> <li>○ Hadley cells and annual cycle</li> <li>○ Governing dynamics</li> <li>○ Mid-latitude jet streams</li> </ul> </li> <li>• Circulation in the Southern hemisphere               <ul style="list-style-type: none"> <li>○ Seasonal mean conditions</li> <li>○ Storms tracks</li> </ul> </li> <li>• Weather over southern Africa               <ul style="list-style-type: none"> <li>○ Sub-tropical anticyclones, wave disturbances</li> <li>○ Synoptic sequence and classification</li> </ul> </li> <li>• Tropical weather analysis of the Indian Ocean</li> <li>• Air pollution meteorology</li> <li>• Atmospheric stability</li> <li>• Air pollution measurement methods and modelling</li> <li>• Environmental and health effects of air pollution</li> <li>• Air pollution control and management</li> </ul>		
	The learners will: <ul style="list-style-type: none"> <li>▪ Describe and evaluate atmospheric processes and pollution and indicate ability to make recommendations and predict scenarios.</li> <li>▪ Identify and evaluate large, medium and small-scale atmospheric processes and pollution and make recommendations.</li> <li>▪ Distinguish, describe and apply methods of investigating atmospheric processes and pollution and make recommendations.</li> <li>▪ Identify, design and evaluate models that apply to forecasting techniques in atmospheric processes and pollution.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments; 16% theory tests and 5% assignments/presentations/activities). 60% Formal end of module theory (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of theory and practical classes		

<b>Title</b>	<b>4GES 331: Land Use and Natural Resource Management</b>		
<b>Code</b>	<b>4GES 331</b>	<b>Department</b>	<b>Geography and Environmental Studies</b>
<b>Prerequisites</b>	4GES211	Co-requisites	None

<b>Aim</b>	This course introduces the student to land use concepts, systems, and management and evaluation techniques. In addition, the course introduces natural resources, their types, distribution, rational use, decision-making systems and management. The course also introduces students to major land use and natural resource management issues confronting society.
<b>Content</b>	<ul style="list-style-type: none"> <li>• Landscape form and function in planning</li> <li>• Physiographic and parametric approaches to terrain evaluation</li> <li>• Topography, slope and land use planning</li> <li>• Application of terrain analysis in soil surveys</li> <li>• The application of geomorphological terrain analysis in soil engineering</li> <li>• Utilisation of topographical features in determination of soil types</li> <li>• and land capability in agriculture</li> <li>• Vegetation, Land use and Environmental Assessment</li> <li>• Landscape Ecology, Land use and Habitat Conservation planning</li> <li>• Types, location and management of Natural Resources</li> <li>• Ethics, Aesthetics, Culture, Assumptions, Theories in Economics of Natural resources</li> <li>• Principles of Economics and Sustainable Natural Resource Management</li> <li>• Natural Resource Valuation Techniques</li> <li>• Environmental management approaches</li> <li>• Case studies on Land Use and Natural Resource Management</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments; 16% theory tests and 5% assignments/presentations/activities). 60% Formal end of module theory (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of theory and practical classes

<b>Title</b>	<b>Climate Dynamics, Weather Variability and Prediction</b>		
<b>Code</b>	<b>4GES341</b>	<b>Department</b>	<b>Geography and Environmental Studies</b>
<b>Prerequisites</b>	4GES222	Co-requisites	None
<b>Aim</b>	<p>This module introduces students to the atmospheric circulation of the southern hemisphere particularly southern Africa. Most emphasis is on the tropical atmosphere and oceans. The planetary-scale circulation of the atmosphere and ocean are discussed as a background for subsequent topics with a focus on African climate. The climatology of tropical weather systems is discussed with emphasis on structure, distribution, seasonal characteristics, and their role in the regional climates and inter-annual climate variability. The associated manifold environmental and societal consequences are covered in the inter-annual variability of the atmosphere-ocean system sessions. The module, in addition, deals with weather variability of the tropics and sub-tropics. The module will help a student develop the ability to analyse tropical and sub-tropical circulation systems over southern Africa. Concepts derived from previous atmospheric circulation modules are vital for understanding weather variability.</p>		

<b>Content</b>	<ul style="list-style-type: none"> <li>• Meteorological scale, Large-scale weather producing processes and systems;</li> <li>• The atmospheric circulation and weather over southern Africa;</li> <li>• Ocean circulation;</li> <li>• Climatology of weather systems;</li> <li>• Inter-annual variability of the atmosphere ocean system;</li> <li>• Human impact;</li> <li>• Introduction to weather variability;</li> <li>• Moisture and precipitation;</li> <li>• Moisture related concepts, rain droplet growth, rainfall augmentation;</li> <li>• Vertical motion and cumulus convection;</li> <li>• Radar reflectivity patterns, storm types;</li> <li>• Prediction of future conditions;</li> <li>• Atmospheric laws and numerical prediction;</li> <li>• Synoptic cycle of sub-tropical weather;</li> <li>• Surface weather patterns over southern African;</li> <li>• Upper level structure &amp; jet stream waves;</li> <li>• Numerical forecasting of weather; Climate modelling &amp; prediction;</li> <li>• Climate change scenarios for southern Africa</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (20% practical assessments; 16% theory tests and 5% assignments/presentations/activities). 60% Formal end of module theory (3 hours) and practical exams
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of theory and practical classes

<b>Title</b>	<b>4GES 312 : Environmental Management</b>		
<b>Code</b>	<b>4GES 312</b>	<b>Department</b>	<b>Geography and Environmental Studies</b>
<b>Prerequisites</b>	4GES212 or 4GES222	Co-requisites	None
<b>Aim</b>	This course introduces the student to environmental management concepts, its problems, concepts, problems and policies. It provides the skills and knowledge to understand the solutions to the debate around environment and sustainable development. The course also introduces students to major environmental issues confronting a developing society.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Environment and Environmental Law</li> <li>• Environment and the Constitution</li> <li>• International Environmental Law</li> <li>• Water Law and the Environment</li> <li>• Conservation of Resources</li> <li>• Pollution Control Law</li> <li>• Land Use and Planning Law</li> <li>• Strategic Environmental Assessment</li> <li>• Integrated Environmental Management</li> <li>• Environmental Management Tools (Environmental Impact Assessment (EIA), Environmental Management Standards (EMS) &amp; Environmental Law</li> <li>• Water pollution, Waste Management</li> </ul>		

	<ul style="list-style-type: none"> <li>• Coastal zone management</li> <li>• Case studies on environmental management</li> <li>• Environmental Justice</li> <li>• South Durban Industrial Basin</li> <li>• Emission levels exceedences e.g. Forskor</li> <li>• Visit to Richards Bay Clean Air Association</li> <li>• Used tyre dumping on gullies in rural areas</li> <li>• Municipal Bye Laws e.g. UMhlathuze Municipality</li> <li>• DWAF regulations</li> <li>• Comparison of RSA's Environmental and Water Laws with those of the USA</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (10% practical exercises; 10% practical test; 16% theory tests and 5% assignments/presentations/activities). 60% Formal end of module theory (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of theory and practical classes

<b>Title</b>	<b>4GES322: Environmental Fieldwork and Research</b>		
<b>Code</b>	<b>4GES322</b>	<b>Department</b>	<b>Geography and Environmental Studies</b>
<b>Prerequisites</b>	4GES211 AND 4GES212 OR 4GES222	Co-requisites	None
<b>Aim</b>	This course introduces students to techniques in geographical research leading to a successful project report. The module provides a framework for geographical research methodology, including how to ask pertinent questions, set short-term goals, uncover background material, collect and analyse field data, and interpret information in a critical scientific manner.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Aspects to be studied will include:</li> <li>• Introduction to Geographical research methods</li> <li>• Writing a research proposal</li> <li>• Literature review</li> <li>• Sampling methods</li> <li>• Questionnaire development</li> <li>• Field data collection</li> <li>• Entry and preliminary analysis of data</li> <li>• Oral presentation of research results</li> <li>• Writing of research report</li> </ul>		
<b>Assessment</b>	16% mid semester test; 10% progress report; 16% oral presentation of research; 60% final research report		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of theory and practical classes Submission of final research report		

## Department of Human Movement Science

### STAFF

Professors	B Shaw, BA (Humanities), BAHons (Sport Science), BAHons (Biokinetics), MPhil (Biokinetics) (RAU), DPhil (Biokinetics) (UJ)
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	L Millard, B (Human Movement Science) BAHons (Human Movement Science: Sport Science), M (Human Movement Science) (NMU)
Secretary	N Nxele Dip (Office Admin) (Varsity College)
Laboratory Assistant	Vacant

### Human Movement Science

Code	4HMS111	Department	Human Movement Science
Title	Human Movement Science 1A		
Prerequisites	None	Co-requisites	None
Aim	<p><b>Paper 1: Concepts of Human Movement</b> This module is designed to serve as an introduction to the cognate disciplines in the field of Human Movement Science and Sport.</p> <p><b>Paper 2: Functional Anatomy</b> The aim of this module is to provide the necessary foundation to the sciences of anatomy and physiology: Basic orientation and terminology: Systematic study of osteology, and adequate knowledge with regards to the skeletal, muscular, cardiovascular and respiratory systems.</p>		

<b>Content</b>	<p><b>Paper 1: Concepts of Human Movement</b> The Centre-M: A conceptual model for studying human movement, Sporting origins; Academic disciplines that make up the Human Movement Science degree; Historical influences into the professional and academic development of Human Movement Science degree; Biomechanics; Exercise Physiology; Fitness and Health; Sport Psychology.</p> <p><b>Paper 2: Functional Anatomy</b> Definitions and terminology of basic anatomy and physiology concepts; Levels of organization; homeostasis; Study of bones and their landmarks, joints and related structures, movement capabilities; muscle tissue &amp; muscular system; cardiovascular system (Blood, arteries, veins); respiratory system (structure and function).</p>
<b>Assessment</b>	40% Continuous assessments (2 x 16% interim tests, 2 x 16% assignments, 2 x 20% practicals) 60% Formal end of module theory (3 hours) exam
<b>DP Requirements</b>	40% Continuous Assessment Mark 80% Attendance at practical sessions

<b>Code</b>	<b>4HMS112</b>	<b>Department</b>	<b>Human Movement Science</b>
<b>Title</b>	Human Movement Science 1B		
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	<p><b>Paper 1: Sociology of Human Movement</b> Learners credited with this module are able to acknowledge the relationship between sport and society; acquire the history of sport; and understand the social significance of sport in modern society. The module allows learners with a capacity for independent inquiry and critical thinking.</p> <p><b>Paper 2: Sport and Leisure Management</b> The aim of the module is to serve as an introduction to the principles, concepts and theories of the sport and leisure management field.</p>		
<b>Content</b>	<p><b>Paper 1: Sociology of Human Movement</b> Theoretical Approaches; Socializing in and through Sport; Sport and Gender; Deviance in Sport; Sport and Youth; Violence and Aggression in Sport; Sport and Media; Sport and Religion.</p> <p><b>Paper 2: Sport and Leisure Management</b> Managing sports; the sport industry environment; creative problem solving and decision making; strategic and operational planning; organizing and delegating work; managing change; human resources management; behavior in organizations; team development, communication in sport; leading; facilities and events.</p>		
<b>Assessment</b>	40% Continuous assessments (2 x 16% interim tests, 2 x 16% assignments, 2 x 20% practicals) 60% Formal end of module theory (3 hours) exam		
<b>DP Requirements</b>	40% Continuous Assessment Mark 80% Attendance at practical sessions		

<b>Code</b>	<b>4HMS211</b>	<b>Department</b>	<b>Human Movement Science</b>
<b>Title</b>	Human Movement Science 2A		
<b>Prerequisites</b>	4HMS112	Co-requisites	None
<b>Aim</b>	<p><b>Paper 1: Kinesiology and Biomechanics</b>  The module serve to introduce learners to an investigation of internal and external forces that affect human performance and the effect those forces has on performance through the branch of physics called mechanics.</p> <p><b>Paper 2: Adapted Physical Education</b>  This course is designed to provide learners with competence and knowledge to evaluate, plan, and implement therapeutic programmes and meeting the needs of individuals with multiple disabilities.</p>		
<b>Content</b>	<p><b>Paper 1: Kinesiology and Biomechanics</b>  Biomechanics Definition and Perspective; Forms of Motion; Standard Reference Terminology; Joint Movement Terminology; Inertia, Mass, Force; Centre of Gravity; Weight; Pressure; Volume; Density; Torque; Impulse; Mechanical Loads on the Human Body; Composition and Structure of Bone; Bone Growth and Development; Bone Response to Stress; Osteoporosis; Joint Architecture, Joints Stability; Joint Flexibility; Common Joint Injuries and Pathologies; Linear Kinematics of Human Movement; Angular Kinematics of Human Movement; Linear Kinetics of Human Movement; Human Movement in a Fluid Environment.</p> <p><b>Paper 2: Adapted Physical Education</b>  Introduction to Adapted Physical Education; Meeting Unique Needs of Athletes with Disabilities; Instructional Models for Therapeutic Modalities; Adapted Activities for different stages of disability; Water Therapy; Planning and Administration for Adapted Physical Programmes.</p>		
<b>Assessment</b>	40% Continuous assessments (2 x 16% interim tests, 2 x 16% assignments, 2 x 20% practicals) 60% Formal end of module theory (3 hours) exam		
<b>DP Requirements</b>	40% Continuous Assessment Mark 80% Attendance at practical sessions		

<b>Code</b>	<b>4HMS212</b>	<b>Department</b>	<b>Human Movement Science</b>
<b>Title</b>	Human Movement Science 2B		
<b>Prerequisites</b>	4HMS111	Co-requisites	None
<b>Aim</b>	<p><b>Paper 1: Exercise Physiology</b>  This module serves to describe and explain the functional and metabolic changes brought about by a single (acute) or repeated exercise sessions (chronic exercise) often with the objective of improving exercise response. The learners will investigate and evaluate the key changes that occur to the various physiological systems at rest, during a single bout of exercise and following chronic exercise.</p> <p><b>Paper 2: Laboratory Technology</b>  To introduce the student to laboratory administration, maintenance and safety of the apparatus, and specific physiological measurements needed for exercise testing</p>		

<b>Content</b>	<p><b>Paper 1: Exercise Physiology</b> Control of the Internal Environment; Bioenergetics; Exercise Metabolism; Cell Signalling and the Hormonal Responses to Exercise; Exercise and the Immune System; The Nervous System: Structure and Control of Movement; Skeletal Muscle: Structure and Function; Circulatory Responses to Exercise; Acid-Base Balance During Exercise; Risk Factors and Inflammation: Links to Chronic Disease.</p> <p><b>Paper 2: Laboratory Technology</b> Laboratory administration, maintenance and safety; Risk Stratification; Criteria for Test termination; Testing Environment; measurement of heart rate; blood pressure; body composition and flexibility; Isokinetic equipment, ECG; VO2 testing and Cardiometabolic screening; feedback and report writing .</p>
<b>Assessment</b>	40% Continuous assessments (2 x 16% interim tests, 2 x 16% assignments, 2 x 20% practicals) 60% Formal end of module theory (3 hours) exam
<b>DP Requirements</b>	40% Continuous Assessment Mark 80% Attendance at practical sessions

<b>Code</b>	<b>4HMS311</b>	<b>Department</b>	<b>Human Movement Science</b>
<b>Title</b>	Human Movement Science 3A		
<b>Prerequisites</b>	4HMS211 & 4HMS212	Co-requisites	None
<b>Aim</b>	<p><b>Paper 1: Exercise Science</b> This course is an introduction to basic principles of fitness and wellness that will provide students with a working knowledge of exercise prescription for apparently healthy groups and special populations.</p> <p><b>Paper 2: Health Education.</b> The aim of this module is to give learners the necessary grounding in the concepts of human- development and –health. Knowledge on sexual health, diseases, relationships, and death. The individual will be encouraged to increase one's own health as well as the community.</p>		
<b>Content</b>	<p><b>Paper 1: Exercise Science</b> Physical Activity, Health, and Chronic Disease; Principles of Prescription and Exercise Program Adherence; Designing Cardiorespiratory Exercise Programs; Designing Resistance Training Programs; Resistance Training and Spotting Techniques; Designing Weight Management and Body Composition Programs; Designing Programs for Flexibility and Low Back Care; Exercise Prescription for Special Cases.</p> <p><b>Paper 2: Health Education</b> Define Health Education. Definitions and terminology; Identify the principles of good health; levels of health prevention; limitations to health prevention. Infectious- &amp; Noninfectious diseases. Gerontological aspects. Outline the development of a healthy personality, healthy emotions, how to manage stress. Define psychopathology and identify the causes. Nutrition and weight management, Personal and interpersonal skills to enhance relationships; Human sexuality, development and expression; Marriage, parenthood and family planning; Conception, pregnancy and child birth. Substance abuse; effects, symptoms, and treatment of substances abuse.</p>		



<b>Assessment</b>	40% Continuous assessments (2 x 16% interim tests, 2 x 16% assignments, 2 x 20% practicals) 60% Formal end of module theory (3 hours) exam
<b>DP Requirements</b>	40% Continuous Assessment Mark 80% Attendance at practical sessions

Code	4HMS321	Department t	Human Movement Science	
Title	Human Movement Science 3C			
Prerequisites	4HMS211 & 4HMS212		Co-requisites	None
Aim	<p><b>Paper 1: Aetiology of Sports Injuries</b> The aim of the module is to provide learners with the necessary knowledge, skills and techniques to understand the aetiology of sports injuries; identify signs and symptoms of sports injuries, and the ability to provide safe, effective assessment and management of soft tissue and sport related injuries, sustained during different phases of training and/or competition.</p> <p><b>Paper 2: Motor Learning</b> This course will focus on the neural control of movement, students will gain a deep understanding of how movements are planned, coordinated, and executed.</p>			
Content	<p><b>Paper 1: Aetiology of Sports Injuries</b> Injury and the stages of an injury; Risk factors and prevention of sports injuries; Classification of Injuries; Injuries due to trauma; Joint ligament injuries; Dislocations; Muscle injuries; Tendon Injuries; Overuse injuries; Concussion; Whiplash; Carpal Tunnel Syndrome; Acromioclavicular Dislocation; Rotator Cuff; Biceps Tendinopathy; Tennis and Golfers Elbow; Scheurmann's Disease; Sciatica and Piriformis Syndrome; Adductor and Abductor Strain; Anterior Knee Pain; Runner's Knee; Anterior Cruciate Ligament (ACL); Tibial Stress Syndrome; Compartment Syndrome; Ankle Sprains and Plantar Fasciitis.</p> <p><b>Paper 2: Motor Learning</b> An Introduction to Motor Learning; The Nervous System; Selective Attention; The Process of Sensation; The Process of Forming a Perception; The Process of Planning Actions; The Process of Producing Actions, Learning Motor Skills.</p>			
Assessment	40% Continuous assessments (2 x 16% interim tests, 2 x 16% assignments, 2 x 20% practicals) 60% Formal end of module theory (3 hours) exam			
DP Requirements	40% Continuous Assessment Mark 80% Attendance at practical sessions			

Code	4HMS322	Department	Human Movement Science
Title	Human Movement Science 3D		
Prerequisites	4HMS211 & 4HMS212	Co-requisites	None
Aim	Paper 1: Measurement and Evaluation		

	<p>The aim of this module is provide the skills necessary to perform various tests and measurements for all age and/or fitness levels groups within a physical activity framework and in all realms of sport.</p> <p><b>Paper 2: Research Methodology</b></p> <p>The aim of this module is to serve as an introduction to sport-and-exercise-science related research methodology. This module serves to provide the background knowledge and skills in sport-and-exercise-science related scientific research.</p>
<b>Content</b>	<p><b>Paper 1: Measurement and Evaluation</b></p> <p>Significance of measurement and evaluation for research findings. Value of testing in sport - why do we test and why is the results significant for sport scientists? Factors affecting sport testing – specificity, validity and reliability of different sport related tests. Sport related motor &amp; physical fitness testing (strength tests; isokinetic testing; explosive power; speed tests; muscle aerobic &amp; anaerobic endurance; agility; flexibility &amp; body composition; and reaction time). Specific testing of different sporting codes of all age and/or fitness levels groups. Report writing and analysing results and findings</p> <p><b>Paper 2: Research Methodology</b></p> <p>The nature of sport-and-exercise-science related research; different ways of problem solving; different types of research; research ethics; the literature review, defining and delimiting the research problem; the research hypothesis, formulation the research method; the needs for statistics; Communication, discussion and interpretation of research findings; drawing communicable conclusions.</p>
<b>Assessment</b>	<p>40% Continuous assessments (2 x 16% interim tests, 2 x 16% assignments, 2 x 20% practicals)</p> <p>60% Formal end of module theory (3 hours) exam</p>
<b>DP Requirement s</b>	40% Continuous Assessment Mark 80% Attendance at practical sessions

<b>Code</b>	<b>4HMS312</b>	<b>Department</b>	<b>Human Movement Science</b>
<b>Title</b>	Human Movement Science 3B		
<b>Prerequisites</b>	4HMS211 & 4HMS212	<b>Co-requisites</b>	None
<b>Aim</b>	<p><b>Paper 1: Exercise Science 2</b></p> <p>This course is designed to provide a comprehensive overview of strength and conditioning. Emphasis is placed on the specific factors influencing sport training and performance.</p> <p><b>Paper 2: Movement Psychology</b></p> <p>The purpose of this module is to provide learners with an overview of the theoretical and applied aspects of the psychology of sport.</p>		
<b>Content</b>	<p><b>Paper 1: Exercise Science 2</b></p> <p>High-Level Performance Training; Periodization; Physiological Responses to Exercise; Healthful Nutrition for Fitness and Sport; Performance-Enhancing Substances; Special Populations; Facility Layout and Scheduling.</p> <p><b>Paper 2: Movement Psychology</b></p> <p>Participation Motivation; Achievement Motivation; Personality and Sport; Attention in Sport; Attentional Strategies; Arousal, Anxiety, and Motor</p>		

	Performance; Arousal Control; Aggression in Sport; Spectators and Sport; Imagery; Psychology of injuries.
<b>Assessment</b>	40% Continuous assessments (2 x 16% interim tests, 2 x 16% assignments, 2 x 20% practicals) 60% Formal end of module theory (3 hours) exam
<b>DP Requirement s</b>	40% Continuous Assessment Mark 80% Attendance at practical sessions

#### 4NDP01 NATIONAL DIPLOMA IN SPORT AND EXERCISE TECHNOLOGY (MODULE DESCRIPTIONS)

MODULE CODE	MODULE NAME	CREDITS	NQF LEVEL	PRE-REQUISITE
<b>FIRST YEAR</b>				
<b>4HMD 119</b>	<b>Sport Didactics and Coaching</b> This module seeks to develop students' abilities to practically apply didactics and coaching principles in the training of diverse population groups in various sports and fitness training programmes. Students will acquire didactic competencies which they will engage to enable their clients to learn skills and strategies in the context of game play.	30	4	None
<b>4HMD129</b>	<b>Sport Management</b> This module is an introduction to the principles, concepts and theories of management in sport and leisure discipline. This module will prepare students for entry-level positions in the business of sport such as sport club management, sport consultancy, sport marketing and governing body administrations.	30	4	None
<b>4HMD139</b>	<b>Sport &amp; Exercise Technology</b> This module will give students an understanding of fitness, basic concepts behind fitness programmes and the practical application of the basic principles in constructing a basic training programme for diverse population groups.	30	5	None
<b>4HMD149</b>	<b>Sport &amp; Physical Recreation Studies 1</b>	30	5	None

	This module will enable the students to gain knowledge of the human body as well as how the body works and interacts with different parts of the body. Included in this module is the study of bones, joints and related structures, movement capabilities, muscle tissue as well as muscular system. Students will also gain knowledge of concepts of leisure, recreation play and work. In addition, students will learn the guidelines to writing a sponsorship letter; risk assessment; emergency procedure; safety equipment and management of sport injuries as well as service learning.			
<b>UZUL100</b>	<b>UNIZULU 101</b> The purpose of the module is to unlock the potential of students to meaningfully access the university curriculum in a way that transcends the constraints of knowledge boundaries; generating new forms of thinking and acting. UNIZULU 101 is constructed in ways that build resonance between students' real-life experiences and histories. It is an investment to be returned by the collaborative and innovative growth of socially engaged students in a socially engaged and relevant university.	16	4	None
<b>SECOND YEAR</b>				
<b>4HMD 219</b>	<b>Human Movement Science</b> This course will focus on the neural control of movements as well as an understanding of how movements are planned, coordinated and executed.	30	5	None
<b>4HMD 229</b>	<b>Exercise Physiology II</b> This module is an extension of the anatomy module in the first year. In this module, students will study the functions of the body in detail with special reference to the interdependence of the different body systems.	30	5	4HMD 149
<b>4HMD 239</b>	<b>Kinesiology</b>	30	5	None

	This module is an introduction to the internal and external forces that affect human performance and the effect those forces have on performance through the branch of physics such as mechanics.			
4HMD249	<b>Sport &amp; Exercise Technology II</b> This module entails the study of the code of ethics, validity and reliability of sport. Components of fitness including body composition; agility; balance; co-ordination; power; reaction time; speed as well as flexibility are discussed. Also included are topics of injuries, gym training, and periodization and sport specific training programs.	30	5	4HMD 139
<b>THIRD YEAR</b>				
4HMD 319	<b>Sport Psychology</b> This module provides an overview of the theoretical and applied aspects of the psychology of sport. It focusses specifically on topics related to psychological variables influencing participation in sport, competitive nature of sport environments as well as psychological strategies used to enhance sport performance.	30	5	4HMD 119 4HMD 129 4HMD 139 4HMD 149
4HMD 329	<b>Health Science</b> This module will focus on health as well as how to improve health by preventing and managing diseases.	30	5	4HMD 119 4HMD 129 4HMD 139 4HMD 149
4HMD339	<b>Exercise Physiology III</b> This module builds on the knowledge that you have gained in Exercise Physiology II. This module will focus be on physiological adaptations and responses to exercise as it relate to human performance, training and limitations.	30	5	4HMD 119 4HMD 129 4HMD 139 4HMD 149 4HMD 229
4HMD349	<b>Sport and Exercise Technology III</b> This module covers the study of medical history and patient details. Also included will be lung function, heart rate and blood pressure testing. Healthy life style choices regarding diet and physical activity as well as stress, sleep, alcohol and smoking. SISA protocols. Aerobic and Anaerobic testing. Components of fitness.	30	5	4HMD 119 4HMD 129 4HMD 139 4HMD 249

**STAFF**

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**Hydrological Research Unit**

Acting Director	BK Rawlins, BScHons (Exeter), MSc (UNIZULU) Pr. Sci. Nat.
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Title	Introduction to Geology		
Code	4HYD112	Department	Hydrology
Prerequisites	None	Co-requisites	None
Aim	The aim of this module is to give learners the necessary grounding in geology for the further study of <u>geohydrology</u> and <u>physical geography</u>		
Content	<ul style="list-style-type: none"> <li>Mineralogy and elementary crystallography; Mineral properties, classification and description of rock forming minerals;</li> <li>Origin and Classification of Igneous Metamorphic and Sedimentary rocks</li> <li>Description and classification of common igneous, metamorphic and sedimentary rocks.</li> <li>The origin and development of the earth; Plate tectonics;</li> <li>Concepts of structural geology; Structural types (faults, folds and joints);</li> <li>Principles of stratigraphy; Overview of South African geology.</li> </ul>		
Outcomes	<ul style="list-style-type: none"> <li>A fundamental knowledge of the development and deformation of the earth's crust and the role of plate tectonics in crustal evolution</li> <li>An ability to identify and classify the most important rock forming minerals and the major generic rock types</li> <li>An ability to identify, interpret and describe the main structural types (folds, faults, joints) from geological maps and the field and be able to solve structural problems</li> <li>An informed understanding of the principles of stratigraphy, stratigraphic successions, paleontology and the rock record.</li> <li>A fundamental knowledge of the South African geological record</li> <li>An ability to interpret the geology of South Africa from geological maps</li> <li>An ability to solve simple stratigraphic problems.</li> <li>An ability to write a brief overview of the geology of South Africa</li> </ul>		
Assessment	40% CAM (16% practical assessments and assignments; 24% Interim tests) 60% Formal end of module exam (3 hours)		
DP Requirement	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>Introduction to Surface Water Hydrology</b>		
<b>Code</b>	<b>4HYD211</b>	<b>Department</b>	<b>Hydrology</b>
<b>Prerequisites</b>	4GES111	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to the concepts of and theories applicable to surface water hydrology		
<b>Content</b>	<p>Introduction to hydrology. Definition and scope of the subject. Systems approach to hydrology. The hydrological cycle. Global hydrology. Hydrology in South and southern Africa. Variability of hydrological systems, Surface water measurement techniques. Gauging network design. Sampling errors. Techniques of surface water data analysis.</p> <p>Runoff generation theories. Hydrograph structure, components and separation. Factors affecting runoff (physical, climatic and anthropogenic). Flood generation theories. Flood assessment, control and protection.</p> <p>Sources of solutes. Water quality parameters of interest. Water quality variability. Temperature variability. Dissolved oxygen. Biological and microbiological aspects. Solute transport. Measurement of surface water quality.</p>		
<b>Outcomes</b>	<p>A sound comprehension of the functioning of the hydrological cycle.</p> <p>An ability to apply a systems approach to depict hydrological systems, interactions and pathways.</p> <p>A sound understanding of the basics of hydrology in the global and South African contexts.</p> <p>A practical knowledge of the instrumentation used for measuring surface hydrological parameters</p> <p>An ability to site, install, maintain and use surface water hydrological instrumentation</p> <p>An ability to design a surface flow gauging network</p> <p>A sound understanding the runoff generation process</p> <p>A capability to undertake simple hydrograph separation exercises.</p> <p>A sound knowledge of how both meteorological and physical catchment characteristics affect the spatial and temporal variability of streamflow</p> <p>A critical awareness of the factors that contribute to flooding and the ability to describe basic strategies for flood control and flood protection.</p>		
<b>Assessment</b>	<p>40% CAM (16% practical assessments and assignments; 24% Interim tests)</p> <p>60% Formal end of module exam (3 hours)</p>		
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark</p> <p>80% Attendance at practical's and fieldwork</p>		

<b>Title</b>	<b>Introduction to Subsurface Hydrology</b>		
<b>Code</b>	<b>4HYD212</b>	<b>Department</b>	<b>Hydrology</b>
<b>Prerequisites</b>	4HYD112	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to the concepts of and theories applicable to soil hydrology and groundwater hydrology		
<b>Content</b>	<p>Basic soil classification</p> <p>Soil hydraulic characteristics</p> <p>Infiltration process and measurement</p> <p>Soil moisture process and measurement</p> <p>Soil moisture movement principles</p>		

	Geological background to groundwater studies Occurrence of groundwater (aquifer types) Groundwater balance (recharge, discharge) Geohydrological parameters Principles of porosity, permeability, storativity and transmissibility Basics of groundwater movement Basics of borehole construction and design.		
<b>Outcomes</b>	On completion of this module, learners will have: An ability to classify a soil A sound understanding of the concepts of field capacity, wilting point and available water An ability to determine experimentally the permeability, porosity and bulk density of a soil A familiarity with the concepts of infiltration and percolation of water into and through a soil An ability to measure the infiltration capacity of a soil A sound understanding of the principles of soil water movement An ability to use direct and indirect methods of soil moisture measurement. The necessary geological background for further study in geohydrology An ability to identify various aquifer materials A sound knowledge of the factors that affect the porosity and permeability of aquifer materials A capability to solve simple groundwater flow problems An ability to use and construct groundwater maps An ability to determine the groundwater balance of a simple aquifer system A sound understanding of the principles of borehole construction		
<b>Assessment</b>	40% CAM (16% practical assessments and assignments; 24% Interim tests 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark    80% Attendance at practical's and fieldwork		
<b>Title</b>	<b>Geographical Information Systems</b>		
<b>Code</b>	<b>4HYD222</b>	<b>Department</b>	<b>Hydrology</b>
<b>Prerequisites</b>	None	Co-requisites	4GES211
<b>Aim</b>	This module is designed to give an introduction to the concepts and principles of GIS development and use. It is a prerequisite or co-requisite for honours level study in Hydrology and Geography		
<b>Content</b>	<ul style="list-style-type: none"> <li>• mapping</li> <li>• cartographic principles</li> <li>• cartographic data</li> <li>• spatial analysis</li> <li>• GIS concepts and components</li> <li>• raster based GIS</li> <li>• vector based GIS</li> <li>• Review of GIS programs (ArcInfo, ArcView, ArcExplorer, Atlas, IDRISI, Regis etc)</li> <li>• Review of related systems (CAD)</li> <li>• Applications and developments in GIS</li> <li>• Application exercise in ArcView</li> <li>• Project using ArcView and satellite imagery</li> </ul>		



<b>Outcomes</b>	<p>On completion of this module, learners will have</p> <ul style="list-style-type: none"> <li>▪ A sound understanding of the geographic components of mapping</li> <li>▪ An ability to think spatially</li> <li>▪ A sound knowledge of cartographic structures and components</li> <li>▪ A sound knowledge of data types, data storage and editing</li> <li>▪ An ability to undertake elementary spatial analysis</li> <li>▪ A sound understanding of the concepts and components of a GIS</li> <li>▪ An ability to use raster based GIS at an introductory level</li> <li>▪ An ability to use vector based GIS at an introductory level (ArcView)</li> <li>▪ A working knowledge of the concepts and applications of GIS</li> <li>▪ A critical understanding of how GIS is related to other systems such as CAD, DEM, DSS</li> <li>▪ A practical ability in using GIS</li> </ul>
<b>Assessment</b>	<p>40% Continuous Assessment Mark (13.3% practical assessments; 13.3% Interim test 13.3% assignments)</p> <p>60% Formal end of module theory and practical exams (3 hours each)</p>
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark</p> <p>80% Attendance at practical's and fieldwork</p>

<b>Title</b>	<b>Surface Water Hydrology</b>		
<b>Code</b>	<b>4HYD311</b>	<b>Department</b>	<b>Hydrology</b>
<b>Prerequisites</b>	4HYD211, 4STT122	Co-requisites	None
<b>Aim</b>	To create an understanding of the dynamics of river flow, and of probability theory and frequency analysis with reference to their applications in hydrological modelling.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Hydro-statics; Hydro-dynamics; derivation of Bernoulli equation for pipe section; Flow routing through channels; Flow routing through reservoirs</li> <li>• Definition of chance and random numbers; counting methods constrained by order and replacement; Combinations, permutations; definition of probability; Conditional probability; Discrete and continuous probability concepts;</li> <li>• Probability distribution; Probability density function; method of moments, maximum likelihood; Normal distribution; Transformation, location, power; other probability functions;</li> <li>• Data/frequency transformations (log, powers); Parameter estimation; Data requirements / sets; Extreme value distributions; Frequency analysis; Applications to hydrological examples</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ An introductory understanding of hydrostatics and hydrodynamics</li> <li>▪ An understand the basic applications of hydrostatics and dynamics to fluid flow in a pipe (Bernoulli Equation)</li> <li>▪ An understanding of the basic application of the Bernoulli equation to fluid flow in an open channel</li> <li>▪ The ability to apply the theory to rating of flow control structures/ flow in porous media/ flood routing</li> <li>▪ Develop and understanding of the basic types of flow control structures</li> <li>▪ Understand the basic models for routing flow through an open channel system</li> </ul>		

	<ul style="list-style-type: none"> <li>▪ A basic understanding of probability theory covering the concepts of chance, random numbers, counting (order/replacement), permutation, combination and probability.</li> <li>▪ An understanding of the transformations - location, weighting (logarithmic, power functions) and probability functions</li> <li>▪ The ability to apply and graphically describe these concepts</li> <li>▪ An understanding of the application of probability theory to stochastic modelling using probability density functions and probability distributions</li> <li>▪ An understanding of the methods for quantifying and describing probability distributions using simple parameters - method of moments and maximum likelihood</li> <li>▪ The ability to apply the theory to applications in hydrology through frequency analysis and model selection.</li> </ul>
<b>Assessment</b>	40% CAM (16% practical assessments and assignments; 24% Interim tests 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork

<b>Title</b>	<b>Groundwater Hydrology</b>		
<b>Code</b>	<b>4HYD321</b>	<b>Department</b>	<b>Hydrology</b>
<b>Prerequisites</b>	4HYD212	Co-requisites	None
<b>Aim</b>	This module is designed to give learners an understanding of the use and application of groundwater exploration and extraction methodologies and of the principles of groundwater movement and of the geohydrological parameters required to determine groundwater flow properties. It further explains the concepts of pump testing under varied geohydrological conditions.		
<b>Content</b>	geological methods used in groundwater exploration; remote sensing in groundwater studies; geophysical methods for surface and subsurface exploration; borehole drilling methods; geological logging; geophysical logging.; Principles of groundwater hydraulics; Darcy's law; Permeability and hydraulic conductivity (theoretical and practical determination); Concepts of anisotropy and inhomogeneity in aquifers; Flow nets; General flow equations; Steady and unsteady groundwater flow in confined and unconfined aquifers; Methods of pump testing; Solution methods for pump tests (Theis, Cooper-Jacob, Chow); Recovery tests; Effects of boundary conditions; Multiple well problems; Well losses; Specific capacity and well efficiency.		
<b>Outcomes</b>	<p>On completion of this module, learners will:</p> <ul style="list-style-type: none"> <li>▪ have a practical knowledge of the methods and means of groundwater exploration</li> <li>▪ have a practical knowledge of applicable drilling methods and techniques</li> <li>▪ have the ability to operate basic geophysical instruments and techniques and be able to interpret the data gained from these methods</li> </ul>		

	<ul style="list-style-type: none"> <li>▪ be able to identify, interpret and describe relevant geological and groundwater associated features from maps and aerial photographs</li> <li>▪ have the ability to construct and interpret groundwater maps, geotechnical maps and flow nets.</li> <li>▪ be fully conversant with Darcy's Law of groundwater flow</li> <li>▪ be able to determine hydraulic conductivity in the laboratory</li> <li>▪ be able to construct and interpret flow nets</li> <li>▪ be aware of the methods of conducting pump tests</li> <li>▪ be able to determine geohydrological parameters from pump test data using various solution methods</li> <li>▪ be able to determine well losses, specific capacity and well efficiency from pump test data</li> </ul>
<b>Assessment</b>	40% CAM (16% practical assessments and assignments; 24% Interim tests 60% Formal end of module exam (3 hours))
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork

<b>Title</b>	<b>Hydrological Modeling</b>		
<b>Code</b>	<b>4HYD332</b>	<b>Department</b>	<b>Hydrology</b>
<b>Prerequisites</b>	4HYD211 and 4HYD212	Co-requisites	4HYD311 and 4HYD321
<b>Aim</b>	Develop an understanding of surface and ground-water modelling techniques as used in hydrological studies		
<b>Content</b>	Introduction to and classification of hydrological models; modelling concepts and a review of available models; the use and application of an integrated surface water/groundwater model; the role of models in water studies; conceptual models of groundwater dynamics; assumptions and constraints involved in the use of models, developing and testing the numerical model using a set of quantitative hydrogeological data that fall into two categories: <ol style="list-style-type: none"> <li>a) data that define the physical framework of the groundwater basin</li> <li>b) data that describe hydrological stress</li> </ol>		
<b>Outcomes</b>	Understand the role of models in hydrological problem solving, <ul style="list-style-type: none"> <li>▪ be able to present the results of hydrogeological investigations in the form of maps, geological sections and tables</li> <li>▪ prepare specific sets of maps:             <ul style="list-style-type: none"> <li>○ contour maps of aquifer upper and lower boundaries</li> <li>○ maps of aquifer characteristics</li> <li>○ maps of aquifer net recharge</li> </ul> </li> <li>▪ be able to classify hydrological models and be aware of their advantages and limitations</li> <li>▪ understand conceptual models for basic surface processes and storage</li> <li>▪ understand the role of models in groundwater studies</li> <li>▪ be able to classify groundwater models (graphical, textual, physical, and numerical - stochastic and deterministic)</li> </ul>		

	<ul style="list-style-type: none"> <li>understand the structure, parameterisation and components required for groundwater models</li> <li>design, use and interpret an integrated model</li> </ul>
<b>Assessment</b>	40% CAM (16% practical assessments and assignments; 24% Interim tests 60% Formal end of module exam (3 hours))
<b>DP Requirement</b>	40% Continuous Assessment Mark 95% Attendance at lectures, practical's and fieldwork

<b>Title</b>	<b>Water Resources Management</b>		
<b>Code</b>	<b>4HYD342</b>	<b>Department</b>	<b>Hydrology</b>
<b>Prerequisites</b>	4HYD211	<b>Co-requisites</b>	None
<b>Aim</b>	This module is designed to enable learners to have a full comprehension of water resources management issues both from a theoretical perspective and as applied to South Africa in practice. It will also cover theoretical and practical aspects of water yield assessment and modelling		
<b>Content</b>	<ul style="list-style-type: none"> <li>Water Resources of South Africa and SADC;</li> <li>Water law in South Africa and International legal agreements;</li> <li>Water demand (urban, rural, agricultural, industrial, environmental).</li> <li>Water Demand Management,</li> <li>Water Supply Management.</li> <li>Water management in South Africa (National Water Resources Strategy; Water Management areas and Catchment Management Agencies, The Reserve and its definition and application).</li> <li>Social, developmental and economic aspects of water resources management.</li> <li>Forecasting of water demand</li> <li>Water availability assessments;</li> <li>Alternatives for water supply (groundwater, conjunctive use; water re-use)</li> <li>Yield assessment and modelling.</li> <li>Water Resources management models.</li> </ul>		
<b>Outcomes</b>	<p>On completion of this module, learners will be:</p> <ul style="list-style-type: none"> <li>Knowledgeable of the water resources situation in South Africa and SADC</li> <li>Conversant with relevant laws and agreements relating to the use, control, and conservation of water in South Africa</li> <li>Fully conversant with the water requirements of the full range of water user sectors</li> <li>Aware of the economic, socio-political, health and physical constraints to water resources management</li> <li>Able to apply predictive techniques for water demand forecasting</li> <li>Conversant with the principles of surface and groundwater resources management as well as their conjunctive use.</li> <li>Able to conduct water yield assessments for single and multiple water sources.</li> <li>Familiar with water resources management models currently in use.</li> </ul>		
<b>Assessment</b>	40% CAM (16% practical assessments and assignments; 24% Interim tests) 60% Formal end of module exam (3 hours)		

<b>DP Requirement</b>	40% Continuous Assessment Mark and 80% attendance at practical's
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**STAFF**

Professor	Vacant
Senior Lecturer	S Krishnannair, BEd (Maths) (India), MSc (Maths) (India), MSc (Eng) (SU), PhD (SU), PGDHE (UKZN)
	M Matadi, BScHons (Maths) (University of Kinshasa), MSc, PhD (applied Maths) (UKZN), PGDHE (UKZN)
	SL Thilahun, BScHons, MSc (AAU, Ethiopia) PhD (USM) Malaysia, PGDHE (UKZN)
Lecturers	J Cloete, BScHons (Natal), PGDHE (UKZN)
	MW Kubheka, MSc (UKZN)
	NM Mkhize, MSc (UKZN)
	PL Zondi, BScHons (UNIZULU), MSc (AIMS)
	S Sibiya, BScHons (UKZN), MSc (UKZN)
nGAP Lecturer	WJ Dlamini, MSc, BScHons, BSc (UKZN)
Secretary	OD Zibani, BA, Dip (Public Admin), PGCE (UNIZULU)

**APPLIED MATHEMATICS**

Title	Discrete Mathematics		
Code	4AMT111	Department	Mathematical Sciences
Prerequisites	None	Co-requisites	4MTH111
Aim	To introduce basic concepts of discrete mathematics.		
Content	<ul style="list-style-type: none"> <li>Applied Logic: Combinatorial circuits. Logic tables. Karnaugh maps. Predicates.</li> <li>Counting and Numbers: Representation of numbers in different bases. Elementary number theory. Arithmetic modulo n, Common algorithms in number theory. Permutations and combinations. Binomial theorem</li> <li>Recurrence relationships and difference equations: Tower of Hanoi problem. Derangements. Fibonacci sequences. Cattallan numbers. Solving linear difference equations</li> <li>Applied graph theory and networks: Basic definitions of graphs, networks and trees. Euler circuits. Hamiltonian paths. Special graphs. Solution of graph problems like the instant insanity problem. De Bruin sequences, Gray codes, Hypercube graphs and their use in hard disk control. Tree traversals. Search trees. Postfix and infix notation.</li> <li>Coding theory: Error correcting codes. Variable length codes. Huffman codes.</li> <li>Algorithm: Euclid's algorithm. Synthetic division. Computing powers. Tiling a deficient board with Trominoes. Order notation</li> </ul>		
Assessment	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)		
DP Requirement	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials.		

<b>Title</b>	<b>Further Discrete Mathematics</b>		
<b>Code</b>	<b>4AMT122</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	4MTH111, 4AMT111
<b>Aim</b>	Introduction to operations research and further discrete mathematics		
<b>Content</b>	<ul style="list-style-type: none"> <li>Elementary number theory and methods of proof (direct proof and counterexample, rational numbers, divisibility, floor and ceiling, contradiction and contradiction, classical theorems).</li> <li>Numerical analysis (roots of transcendental equations, Euler method of solving differential equations, numerical integration and differentiation).</li> <li>Population modeling (logistic and Malthusian growth)</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials.		

<b>Title</b>	<b>Dynamical Systems and Mathematical Modelling</b>		
<b>Code</b>	<b>4AMT211</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	4AMT122	<b>Co-requisites</b>	4MTH221
<b>Aim</b>	To study how to convert problems in the field of population studies, traffic flow, epidemics and physiological processes into a system of differential-, partial differential- and difference equations. To study the qualitative behaviour of the solutions of the equations, and the behaviour of dynamical systems like bifurcation and chaos. Where possible analytic solutions will be investigated, and if not, a numerical or Monte Carlo simulation of the equations will be performed.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Modelling process illustrated by dimensional analysis and scaling behaviour of systems</li> <li>Population growth models</li> <li>Interacting populations – Lotka-Volterra type of equations</li> <li>Epidemic models</li> <li>Dynamical system behaviour – phase plane analysis, bifurcation, oscillation and chaotic systems</li> <li>Study of a particular modelling process from either industry (e.g., traffic flow models) or the soft sciences (modelling the heart)</li> </ul>		
<b>Assessment</b>	40% continuous assessment mark. 60% Three hour examination at end of module		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at tutorials and lectures		

<b>Title</b>	<b>Introduction to Operations Research</b>		
<b>Code</b>	<b>4AMT212</b>	<b>Department</b>	<b>Mathematical sciences</b>
<b>Prerequisites</b>	4AMT122	<b>Co-requisites</b>	4MTH222

<b>Aim</b>	To introduce students to linear and nonlinear programming and operations research
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction to operations research</li> <li>• Lanchester's model of war of attrition, problems in business, e.g., scheduling, leading to optimization problems.</li> <li>• Introduction to Linear Programming</li> <li>• Well known linear programming problems like finding the cheapest mixture of foodstuffs which would satisfy the nutritional requirements of animals.</li> <li>• The standard linear programming problem</li> <li>• Maximize the objective function <math>cx</math> subject to the equality constraint <math>Ax = b</math> and the inequality constraint <math>x \geq 0</math>.</li> <li>• Methods of converting a problem to the standard form. Introduce standard terminology – feasible solution, extreme points, and basic solution.</li> <li>• The Simplex method</li> <li>• This algorithm is developed</li> <li>• Applying the Simplex Method</li> <li>• Programs for implementing the simplex method and commercial LP packages is investigated</li> <li>• Nonlinear programming</li> <li>• Integer, geometric and other programming methods are discussed</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at tutorials and lectures.

<b>Title</b>	<b>Applied Mathematical Methods</b>		
<b>Code</b>	<b>4AMT321</b>	<b>Department</b>	<b>Mathematical sciences</b>
<b>Prerequisites</b>	4AMT212,	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to the mathematical methods used in physics and engineering		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Orthogonal polynomials</li> <li>• Concept of orthogonality of functions. The Gram 4CHMidt process for finding an orthogonal basis of functions</li> <li>• Special functions</li> <li>• Legendre polynomials</li> <li>• Hermite polynomials</li> <li>• Solution of ordinary differential equations using a series expansion (Frobenius method)</li> <li>• Bessels functions</li> <li>• Introduction of Fourier series and transforms</li> <li>• The subject is introduced and some of its applications are treated.</li> <li>• Introduction to partial differential equations</li> </ul>		



	<ul style="list-style-type: none"> <li>• Derivation of standard differential equations. Solution of first order partial differential equations. Cauchy's method of characteristics</li> <li>• Classification of second order partial differential equations</li> <li>• Method of characteristics</li> <li>• Solution of partial differential equations</li> <li>• Solution of the wave equation, parabolic and elliptic equations and some practical applications</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials

<b>Title</b>	<b>Classical Mechanics</b>		
<b>Code</b>	<b>4AMT312</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	4AMT212	<b>Co-requisites</b>	None
<b>Aim</b>	To introduce rigid body motion and alternative formulations to Newtonian mechanics		
<b>Content</b>	Rigid body motion, Lagrange and Hamilton approach, variational methods.		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials		

<b>Title</b>	<b>Numerical Methods</b>		
<b>Code</b>	<b>4AMT322</b>	<b>Department</b>	<b>Mathematical sciences</b>
<b>Prerequisites</b>	4AMT212,	<b>Co-requisites</b>	None
<b>Aim</b>	This module introduce students to numerical analysis		
<b>Content</b>	Introduction to Numerical analysis Origin of problems. Error analysis. Types of error Numerical solution of equations Bisection, fixed point, Newton-Raphson method and others are introduced to find the root of an equation. Interpolation Existence of interpolating polynomial. Difference tables. Standard interpolating polynomials. Numerical differentiation and numerical solution of differential equations Numerical differentiation. Euler's and Runge-Kutta methods. Boundary value methods Numerical integration Newton-Cotes integration. Gaussian quadrature Solution of linear equations Gaussian reduction. LU decomposition Matrix calculations		

	Finding eigenvalues numerically.
<b>Assessment</b>	20% Continuous Assessment Mark 30% Practical mark 50% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures, practical's and tutorials

<b>Title</b>	<b>Tensor Analysis</b>		
<b>Code</b>	<b>4AMT331</b>	<b>Department</b>	<b>Mathematical sciences</b>
<b>Prerequisites</b>	4AMT212	Co-requisites	None
<b>Aim</b>	To introduce tensors and its applications to relativity		
<b>Content</b>	Vectors and tensors Lorentz transformation and applications Electromagnetism Tensor Analysis Christoffel symbols Field equations Calculations of tensors using computers		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials		

#### MATHEMATICS

<b>Title</b>	<b>Calculus I</b>		
<b>Code</b>	<b>4MTH111</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	To introduce differential calculus with necessary prerequisites from logic and general algebra.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Elementary Logic and Theory of Sets: sets and subsets, Venn-Euler diagrams, basic set operations, sets of numbers, elementary logic.</li> <li>• Functions: elementary functions, graph of a function, combination of functions, inverse functions, exponential and logarithmic functions, relations.</li> <li>• Limits, Continuity and Differentiation: definition of limit, continuity and the derivative</li> <li>• Algebra: induction, vectors and vector algebra, dot products and cross products, introduction to matrices and matrix algebra, transpose and determinants, the adjoint matrix, invertible matrix and Cramer's rule, complex numbers and De Moivre's theorem.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials.		

<b>Title</b>	<b>Calculus II</b>		
<b>Code</b>	<b>4MTH112</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>		<b>Co-requisites</b>	4MTH111
<b>Aim</b>	The aim of the module is to further develop concepts in calculus (integration, elementary introduction to differential equations) and to apply their techniques in problem solving.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Differentiation: some differentiation formulas, the chain rule, implicit differentiation, the mean-value theorem and applications, some curve sketching, applications of derivatives.</li> <li>• Integration and Techniques of integration: the fundamental theorem of integral calculus, indefinite integrals, some area problems,</li> <li>• Transcendental functions: logarithmic, exponential, inverse trigonometric functions, hyperbolic functions.</li> <li>• Elementary Introduction to Differential Equations: First order linear equations.</li> <li>• Sequences: properties, limits.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials		

<b>Title</b>	<b>Mathematics and Statistics for Earth and Life Sciences</b>		
<b>Code</b>	<b>4MTH122</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	To supply basic mathematical knowledge necessary for life science students.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Basic general mathematics: powers, estimation and proportion. Numerical and algebraical skills. Equations, inequalities, systems of equations. Functions and graphs. Exponential and logarithmic functions.</li> <li>• 2. Statistics: Frequency distributions and their graphs. Histograms. Mean, median, mode. Standard deviation, variance.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials.		

<b>Title</b>	<b>Linear Algebra and Differential Equations</b>		
<b>Code</b>	<b>4MTH222</b>	<b>Department</b>	<b>Mathematical sciences</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	4MTH221

<b>Aim</b>	This module is designed to introduce students to the concepts of linear algebra, and to methods of finding exact solutions to ordinary differential equations
<b>Content</b>	Linear algebra: finite and infinite dimensional vector spaces, subspaces, linear transformations and matrices, systems of linear equations, determinants, change of bases, similar matrices, eigenvalues and eigenvectors. Differential equations: study ordinary differential equations such as separable variables, exact equations, linear equations. Solutions of homogeneous differential equations with constant coefficients, Cauchy-Euler equation, systems of linear equations, nonlinear equations, Laplace transforms, homogeneous linear systems with constant coefficients.
<b>Assessment</b>	40% continuous assessment (two assessments during the semester each carrying a weight of 20%) 60% formal end of semester 3hr exam on all material covered during the semester.
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials

<b>Title</b>	<b>Advanced calculus</b>		
<b>Code</b>	<b>4MTH221</b>	<b>Department</b>	<b>Mathematical sciences</b>
<b>Prerequisites</b>	4MTH112	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to the concepts of advanced calculus		
<b>Content</b>	The study of, series, vector functions and the calculus of vector functions, functions of several variables. Continuity and Partial differentiation, Taylor's theorem, gradient, double and triple integrals, the Jacobian and line integrals		
<b>Assessment</b>	40% continuous assessment 60% formal end of semester 3hr exam on all material covered during the semester.		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials		

<b>Title</b>	<b>Abstract Algebra</b>		
<b>Code</b>	<b>4MTH311</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	4MTH222	Co-requisites	None
<b>Aim</b>	To introduce students to the theories of groups, rings and fields.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Theory of Groups: Fundamentals (Mappings, binary operations, relations).</li> <li>The integers. Groups. Subgroups. Cyclic groups. Isomorphisms. Homomorphisms. Finite permutation groups. Cayley's theorem. Normal subgroups. Quotient groups. Some applications of the theory of groups.</li> </ul>		

	<ul style="list-style-type: none"> <li>Theory of Rings and Fields: Rings. Integral domains. Fields. Ideals. Quotient Rings. Ring homomorphism. The field of real numbers. Complex numbers. Quaternions. Polynomials over a ring.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials

<b>Title</b>	<b>Real Analysis</b>		
<b>Code</b>	<b>4MTH321</b>	<b>Department</b>	<b>Mathe matical Scienc es</b>
<b>Prerequisites</b>	4MTH222	<b>Co-requisites</b>	None
<b>Aim</b>	To introduce students to the theory of functions of real variables and metric spaces.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Real numbers and real functions. Topology of real line and plane. Compactness. Completeness. Countability. Cardinality. Order</li> <li>Metric and normed spaces. Metrics. Norms. Properties of metric and normed spaces.</li> <li>Riemann integral. Upper and lower Riemann integrals. Riemann integrability. Properties of the Riemann integral.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials		

<b>Title</b>	<b>Graph Theory</b>		
<b>Code</b>	<b>4MTH322</b>	<b>Department</b>	<b>Mathemati cal Sciences</b>
<b>Prerequisites</b>	4MTH222	<b>Co-requisites</b>	None
<b>Aim</b>	To explore proof techniques in graph theory and explore its applications in pure and applied mathematics		
<b>Content</b>	<ul style="list-style-type: none"> <li>Introduction to Graph theory</li> <li>Types of graph, representation of graphs, Hamiltonian and Euler circuits</li> <li>Graph theorems, Vertex and edge colorings</li> <li>Practical applications of graphs</li> <li>Network problems.</li> <li>Mathematical applications</li> <li>Representation of an equation by means of a graph</li> <li>Elementary aspects of category theory</li> </ul>		

<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 90% Attendance at lectures, practical's and tutorials

<b>Title</b>	<b>Complex analysis</b>		
<b>Code</b>	<b>4MTH322</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	4MTH221, 4MTH222	<b>Co-requisites</b>	None
<b>Aim</b>	To introduce students to the theory of functions of complex variables.		
<b>Content</b>	Complex functions, their limits and continuity. Complex differentiation. Cauchy- Riemann equations. Complex integration. Cauchy's theorem and formulas. Infinite series. The residue theorem and its application in evaluation of integrals and series. Conformal mapping.		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials		

### STATISTICS

<b>Title</b>	<b>Elementary Statistics for Science students</b>		
<b>Code</b>	<b>4STT111</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	To introduce elementary concepts of descriptive and inferential statistics to science students.		
<b>Content</b>	Types of data; Basic sampling techniques; Frequency distributions; Graphical data summaries – various charts, dot-plots, stem-and-leaf, histograms, polygons, and ogives; Numerical data summaries – measures of location, spread, relative position; Boxplots; Sample space, events, and operations; Counting techniques; Probability versus relative frequency; Laws of probability; Conditional probability; Independent events; Bayes' theorem; Discrete random variables; Probability mass functions and cumulative distribution functions; Moments of discrete random variables; Special discrete distributions; The normal distribution; Single-sample hypothesis tests for means, variances, and proportions; Single-sample confidence intervals for means, variances, and proportions; Two-sample hypothesis tests for means, variances, and proportions; Two-sample confidence intervals for means, variances, and proportions; The p-value; Contingency tables and the test for independence; Scatterplots, simple linear regression, correlation, and hypothesis tests for the intercept and slope.		
<b>Assessment</b>	40% Continuous Assessment mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures, practical's and fieldwork		

<b>Title</b>	<b>Mathematics and Statistics for Commerce</b>		
<b>Code</b>	<b>4STT121</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	To introduce mathematics used in the field of commerce and to explore some aspects of Financial Mathematics		
<b>Content</b>	Fractions and decimals – addition, multiplication, division, and subtraction; Exponential and logarithmic functions; Graphs – axes, scale, coordinates, straight lines, and intersections; Elementary interest – simple interest, compound interest, present and future values, changing interest rates; Annuities – ordinary annuity due, ordinary annuity certain, and deferred annuities; Index numbers – simple- and compound index numbers, important indices, rate of change, and inflation; Introduction to time series – moving averages and seasonal adjustments.		
<b>Assessment</b>	40% Continuous Assessment mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% attendance at lectures and tutorials		

<b>Title</b>	<b>Statistics for Science students</b>		
<b>Code</b>	<b>4STT112</b>	<b>Department</b>	<b>Mathematical Science</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	4STT111 4MTH112
<b>Aim</b>	To introduce students to sets, probability spaces, random variables, and discrete distributions.		
<b>Content</b>	Counting techniques continued; Sets revisited – fields, sigma fields; Probability – events, axioms, operations, conditional- and independence, Bayes' Theorem; Discrete random variables – probability mass functions, cumulative distribution functions, moments; Discrete bivariate distributions – marginal distributions, and conditional distributions; Linear functions of a discrete random variable; Independent random variables; Special discrete random variables.		
<b>Assessment</b>	40% Continuous Assessment mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials		

<b>Title</b>	<b>Elementary Statistics for Commerce Students</b>		
<b>Code</b>	<b>4STT122</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	To introduce elementary concepts of descriptive and inferential statistics to students of commerce and administration.		
<b>Content</b>	Types of data; Basic sampling techniques; Frequency distributions; Graphical data summaries; Numerical data summaries – measures of location, spread, relative position; Sample space, events, and operations; Counting techniques; Probability versus relative frequency; Laws of probability; Conditional probability; Independent events; Bayes'		

	theorem; Discrete random variables; Probability mass functions and cumulative distribution functions; Moments of discrete random variables; Special discrete distributions; The normal distribution; Single-sample hypothesis tests for means, variances, and proportions; Single-sample confidence intervals for means, variances, and proportions; Two-sample hypothesis tests for means, variances, and proportions; Two-sample confidence intervals for means, variances, and proportions; The p-value; Contingency tables and the test for independence; Simple linear regression, correlation, and hypothesis tests for the intercept and slope.
<b>Assessment</b>	40% Continuous Assessment mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% attendance at lectures and tutorials

<b>Title</b>	<b>Distribution Theory</b>		
<b>Code</b>	<b>4STT211</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	4STT112	<b>Co-requisites</b>	4MTH221
<b>Aim</b>	To introduce fundamental continuous distributions and their properties which will be used in Statistical Inference and which will form the foundation for all third year level statistics modules.		
<b>Content</b>	Random variables of the continuous type; Continuous distributions – probability density function, cumulative distribution function, and moments; Special continuous distributions; Distributions of functions of random variables; Mixed distributions; Distributions of two continuous random variables; Correlation coefficients; Marginal distributions; Conditional distributions; The bivariate normal distribution; Transformations of random variables; Independent random variables; Distributions of sums of independent random variables; Random functions associated with the normal distribution; Approximations for discrete distributions; The central limit theorem; Limiting distributions; Chebychev's inequality and convergence in probability.		
<b>Assessment</b>	40% Continuous assessment mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials		

<b>Title</b>	<b>Statistical Inference</b>		
<b>Code</b>	<b>4STT212</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	4STT211 4MTH222
<b>Aim</b>	To introduce students to estimation, and parametric- and nonparametric hypothesis tests.		
<b>Content</b>	Order statistics; Maximum likelihood, methods-of-moments, and ordinary least squares estimation methods; Properties of estimation; Point estimation of means, variances, proportions, and differences; Sampling distributions; Confidence intervals for means, variances, proportions, and differences; Sample size calculations; Distribution-free confidence intervals; Simple linear regression – point- and interval		



	estimation of regression parameters; Hypothesis tests for single parameters (mean, variance, proportion, and regression parameters) and differences (between means, variances, proportions, and regression parameters); Contingency tables - goodness-of-fit test, and test for independence; Introduction to ANOVA; Nonparametric tests – Wilcoxon, Kolmogorov-Smirnov, and Runs test; Sufficient statistics; Power of a statistical test; Best critical regions; Uniformly most powerful tests; Likelihood ratio tests.
<b>Assessment</b>	40% Continuous assessment mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials

<b>Title</b>	<b>Random Processes</b>		
<b>Code</b>	<b>4STT311</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	4STT211 4MTH222	<b>Co-requisites</b>	None
<b>Aim</b>	To introduce students to probability models.		
<b>Content</b>	Probability spaces revisited; Random variables revisited – discrete, continuous, and mixed; Conditional probability and conditional expectation; Computing probability, expectation, and variances by conditioning; Reflection principle; Generating functions; Random walks; Discrete-time Markov chains; Chapman-Kolmogorov equations; Classification of states; Limiting probabilities (discrete-time); Branching processes; Bernoulli processes; Number of successes; Time of successes; Exponential distribution and the Poisson process; Interarrival- and waiting time distributions; Birth- and death processes; Transition probability function; Limiting probabilities (continuous-time).		
<b>Assessment</b>	40% Continuous assessment mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures and tutorials		

<b>Title</b>	<b>Experimental Design</b>		
<b>Code</b>	<b>4STT321</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	4STT212	<b>Co-requisites</b>	None
<b>Aim</b>	To provide the student with a basic theory of experimental design, particularly in complete randomized block design and ANOVA		
<b>Content</b>	ANOVA, Completely randomized and randomized block design, Latin square design, introduction to factorial designs, $2^k$ Factorial and fractional designs, designs with confounding		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at lectures, practical's and fieldwork		

<b>Title</b>	<b>Linear Models</b>		
<b>Code</b>	<b>4STT312</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	4STT212	<b>Co-requisites</b>	None
<b>Aim</b>	To introduce students to the theory and applications of linear models.		
<b>Content</b>	Linear algebra revisited; Multivariate change-of-variable techniques; Special integrals and the multivariate normal distribution; Marginal and conditional distributions of a normal random vector; Non-central distributions; Quadratic forms and their distributions; Independence conditions for quadratic and linear forms; Introduction to the general linear model; Estimation in the general linear model; Models not of full rank; Estimable functions and hypothesis testing; The general linear hypothesis; Confidence intervals; Applications of the general linear model; Introduction to the multiple linear regression model; Hypothesis testing; Orthogonality in the regression model; Model selection procedures and applications.		
<b>Assessment</b>	40% Continuous assessment mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's, tutorials and lectures		

<b>Title</b>	<b>Time Series</b>		
<b>Code</b>	<b>4STT322</b>	<b>Department</b>	<b>Mathematical Sciences</b>
<b>Prerequisites</b>	4STT212	<b>Co-requisites</b>	None
<b>Aim</b>	To provide a thorough understanding of the theory and computer applications of time series techniques		
<b>Content</b>	Descriptive techniques for time series, Exponential smoothing and the Box-Jenkins model including the AR, MA, ARMA and ARIMA.		
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's, tutorials, lectures and fieldwork		

## Department of Nursing Science

### STAFF

Associate Professor	J Kerr, DNE, DNA, M Cur (Stellenbosch), PhD (UKZN), RN, RM, CHN, OHN,
Senior Lecturers	RM Miya, B Cur (UNIZULU), M Cur (UKZN), DLitt et Phil (UNISA), RN, CHN, PSYCH VACANT
Lecturers	NF Ngcobo, B Cur Hons, M Cur (UNIZULU), RN, RM, Dip (Psych), CHN AS Joubert, B Cur (UP), MCur (UP), RN, RM, Dip (Nursing Education) (UNISA) ST Madlala, Dip (RN), (CHN), (Psych), Mid (FSSON), AdvDip (NA), (NE), (UNISA), B Cur Hons (UNISA), BTech (OHN) (TUT), M Tech (DUT) NSB Linda, B Cur (E et CHN) (UNISA), MN (UKZN), PhD (UWC), RN, RM, Intensive Nursing Science RN, RM, F.O. Nyalunga, MN, Dip (RN), (RM), (CHN), (Psych), PGDip Midwifery & Neonatal Nursing Science, DNEd, DNASE Mgolozeli, MCur (UP), RN, RM, RPN, CHN, DNEd, DNA
Secretary	NT Makhoba, B A Hons, PGDip (Education), (UNIZULU)
Clinical Instructors	GALZ Ntombela B Cur (UNIZULU) B Cur E et A ( UNIZULU) N Magoso, B Cur (UNIZULU), RN, RCHN, PSYCH

Title	Ethos and Professional practice		
Code	SNEP111	Department	Nursing Science
Prerequisites	Nil	Co-requisites	Nil
Aim	To inculcate the ethical and moral codes of the nursing profession.		
Content	<p>The learner will understand and integrate:</p> <ul style="list-style-type: none"> <li>History, philosophy, essence of nursing, nursing values, ethical codes and the principles in nursing profession</li> <li>Ethos of nursing and professionalization which includes the dynamics, aspects of professional practice, Legislation and control</li> <li>Continuing professional education development and health behaviour</li> <li>Professional and labor organizations for nursing, their characteristics, aims, functions and related legislation</li> <li>Health care management</li> <li>Management approaches and principles</li> <li>Methods and techniques for the management of a nursing unit and primary health care services</li> <li>Human resource management</li> <li>Leadership</li> <li>Safe guarding the patients' wellbeing and environment e.g. infection control</li> <li>Teaching principles and methods for clinical and methods and patient teaching and teaching of lay workers</li> <li>Counselling and negotiation skills</li> </ul>		
Assessment	Continuous assessment 40%, Final 3 hour theory exam 60%		
DP Requirement	40% Continuous Assessment Mark, 80% Attendance at practical sessions		

<b>Title</b>	<b>Fundamental Nursing 1A</b>		
<b>Code</b>	<b>SNFN 111</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	To develop competency in the practice of care for healthy or ill individuals in terms of basic needs throughout the life span.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction to nursing science</li> <li>• Impact of disease on family, community and society; Cultural differences in regard to health and illness including health practices; Sick role and implications for nursing and health; Origin, nature and development of man from conception to old age (physical, psychological, social and cultural aspects); Basic needs of man</li> <li>• Nutrition Basic components and kilojoule values of food; Nutritional needs of individuals in all stages of development; Nutrition within cultural context and religion; Importance of nutrition in the prevention and treatment of disease; Socio-economic aspects of nutrition; Factors influencing food production, storage and preservation; Community nutrition</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark, 80% Attendance at practical sessions		

<b>Title</b>	<b>Community Health Nursing and related microbiology 1A</b>		
<b>Code</b>	<b>SNCH 111</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	To develop competency in the practice of community health nursing practice and the application of the science- based knowledge of microbiology.		
<b>Content</b>	Introduction to community health nursing; History of public health; Community oriented learning: Home visit, case studies and community development; Definition of concepts; Community health and disease prevention; Health education, principles, methods and techniques; The concept epidemiology, principles and biostatics; Environmental health ; Personal hygiene and food hygiene; Functional anatomy of prokaryotic and eukaryotic cells; Introduction to bacteria and viruses; Classification of microorganisms; Microbial growth and control of microbial growth.		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark, 80% Attendance at practical sessions		

<b>Title</b>	<b>Human Anatomy and related Medical Biophysics 1A</b>		
<b>Code</b>	<b>4ZOL 121</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	To enable the student to extend and integrate the study of the body and related medical biophysical principles to the human anatomical structure		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Structure of the cell, various body tissues and organs.</li> <li>• The musculoskeletal system;</li> <li>• The digestive system;</li> <li>• The respiratory system;</li> <li>• The cardiovascular system; and</li> <li>• The nervous system.</li> <li>• The metric System and measurement</li> <li>• Orthopedic ward and muscular and unit prefix</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark, 80% Attendance at practical sessions		

<b>Title</b>	<b>Fundamental Nursing 1B</b>		
<b>Code</b>	<b>SNFN112</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	To develop competency in the practice of care for healthy or ill individuals in terms of basic needs throughout the life span		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Health, illness and dying</li> <li>• Health care structures</li> <li>• Cultural determinants, organization of health services in South Africa</li> <li>• Communication and interpersonal skills</li> <li>• Listening, reflecting</li> <li>• Supporting individuals, groups and communities</li> <li>• Managing emotions, managing silence</li> <li>• Time management, counseling</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark, 80% Attendance at practical sessions		

<b>Title</b>	<b>Community Health Nursing and related parasitology 1B</b>		
<b>Code</b>	<b>SNCH112</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	To develop competency in the practice of community health nursing practice and the application of the science- based knowledge of parasitology.		

<b>Content</b>	Community health nursing aspect: <ul style="list-style-type: none"> <li>• The factors that influence the health and welfare of people of all age groups.</li> <li>• Differences between urban and rural community health.</li> <li>• Primary, secondary and tertiary levels of health care of all age groups within scope of practice of the community health nurse.</li> <li>• Parasitology aspect:</li> <li>• Epidemiological findings in nursing care practice</li> <li>• Principles of diseases</li> <li>• The management of diseases and conditions in primary health care settings i.e. microbial mechanism of pathogenicity</li> </ul>
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%
<b>DP Requirement</b>	40% Continuous Assessment Mark, 80% Attendance at practical sessions

<b>Title</b>	<b>Human Anatomy and related Medical biophysics 1B</b>		
<b>Code</b>	<b>4ZOL122</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	To enable the student to extend and integrate the study of various body systems and related medical biophysical principles to the human anatomical structure		
<b>Content</b>	<ul style="list-style-type: none"> <li>• The endocrine system;</li> <li>• The reproductive system;</li> <li>• The urinary system; and</li> <li>• The special senses.</li> <li>• Respiratory ward and client care: interactions between lungs and atmosphere</li> <li>• Intensive care unit: electricity and magnetism in the body</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark, 80% Attendance at practical sessions		

<b>Title</b>	<b>General Nursing Science 2A</b>		
<b>Code</b>	<b>SNGN211</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNFN111, SNFN112, 4ZOL 121, 4ZOL 122	Co-requisites	None
<b>Aim</b>	To develop competence in the management of medical and surgical conditions at all levels of health care and the provision of safe, effective management of patient on medication therapy.		

<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction to medical and surgical nursing</li> <li>• Introduction to Pharmacodynamics and Pharmacokinetics</li> <li>• Cardiovascular conditions and related surgery</li> <li>• Respiratory conditions and related surgery</li> <li>• Diet therapy, professional nursing practice and pharmacotherapy related to the nursing care of above conditions</li> </ul>
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's in the simulated and clinical area

<b>Title</b>	<b>Community Health Nursing 2A</b>		
<b>Code</b>	<b>SNCH 211</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNCH111, SNCH112, SNFN111, SNFN112, 4ZOL121, 4ZOL 122,SNPR119	Co-requisites	None
<b>Aim</b>	To develop competency in the provision of community health nursing based on scientific approach. To lay a foundation on preventive, promotive and curative aspect of health care..		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Measures to prevent diseases and promote health at primary, secondary and tertiary</li> <li>• Mental health problems</li> <li>• Care of the aged.</li> <li>• Physical growth and development of the child</li> <li>• The factors influencing nutrition and types of infant feeding.</li> <li>• Long term care and rehabilitation.</li> <li>• The therapeutic environment.</li> <li>• Personality development by Erikson, Freud, Kohlberg and Piaget and compare these.</li> <li>• Introduction to genetics and genetic counselling</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>Human Physiology &amp; related Medical Biophysics 2A</b>		
<b>Code</b>	<b>SNHP211</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	None	Co-requisites	4ZOL121 or 4ZOL122
<b>Aim</b>	To enable the student to extend and integrate the study of various body parts' functioning based on the science of chemistry.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Human cell, tissues, membrane and glandular functioning</li> <li>• Functions of skeletal system and skeletal muscles</li> <li>• Cardiovascular system and lymphatic system functions</li> <li>• Functions of blood and blood clotting mechanisms</li> </ul>		

	<ul style="list-style-type: none"> <li>• Nervous system (somatic and autonomic function) and function of endocrine system</li> <li>• Matter and energy, Common gases (Oxygen, hydrogen, carbon, nitrogen)</li> <li>• Symbols and main functions of important organic elements, reactions and equations</li> <li>• Carbon-containing compounds, chemical bonding</li> <li>• Biologically important compounds</li> <li>• Water, minerals and electrolytes (intra-and extra-cellular electrolytes),</li> <li>• Maintenance of the acid- base balance</li> <li>• Ionization, radioactivity and radio-active isotope</li> </ul>
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork

<b>Title</b>	<b>General Nursing Science 2B</b>		
<b>Code</b>	<b>SNGN212</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	4ZOL121, 4ZOL122, SNFN111, SNFN112	Co-requisites	None
<b>Aim</b>	To develop competence in the management of medical surgical conditions and paediatric conditions at all levels of health care and the provision of safe, effective management of patient on medication therapy		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Digestive system disorders and related surgical conditions</li> <li>• Urinary system disorders (female, male) and related surgical conditions</li> <li>• Paediatric conditions</li> <li>• Diet therapy, professional nursing practice and pharmacotherapy related to the nursing care of above conditions</li> <li>• Pharmacodynamics and pharmacokinetics in practice</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>Community Health Nursing 2B</b>		
<b>Code</b>	<b>SNCH212</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNCH111, SNFN111, 4ZOL121, SNPR119	SNCH112, SNFN112, 4ZOL122, Co-requisites	None



<b>Aim</b>	To develop competency in the provision of evidence-based community health nursing care. To lay a foundation on preventive, promotive and curative aspects of health care.
<b>Content</b>	<ul style="list-style-type: none"> <li>• Social issues in relation to health.</li> <li>• Occupational health industrial health and public health</li> <li>• Community development programmes.</li> <li>• Epidemiology methods and classification</li> <li>• Family planning methods, uses, indications, modes of action, advantages and disadvantages. - -</li> <li>• The role and functions of a community health nurse in family care.</li> <li>• Certain baseline information necessary for family care-family characteristics and family dynamics.</li> <li>• Practical</li> </ul>
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork

<b>Title</b>	<b>Human Physiology &amp; related Medical Biochemistry 2B</b>		
<b>Code</b>	<b>SNSC232</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNSC131 and SNSC132	Co-requisites	None
<b>Aim</b>	To enable the student to extend and integrate the study of various body parts' functioning based on the science of chemistry.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Respiratory, Digestive system functions, temperature regulation,</li> <li>• Urinary system functioning, reproduction (male and female) systems</li> <li>• Special senses and how they function</li> <li>• Defence mechanisms of the body, Immune system and stress</li> <li>• Enzymatic and genetic control of reactions</li> <li>• Metabolic and respiratory homeostasis mechanisms</li> <li>• Digestion and absorption of nutrients</li> <li>• Metabolism and metabolic end-products</li> <li>• Hormones and vitamins in physiological processes</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>General Nursing Science 3A</b>		
<b>Code</b>	<b>SNGN311</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNGN211, SNGN 212, SNPR219, SNHP211, SNHP212	Co-requisites	None
<b>Aim</b>	To develop competency in the nursing management of Specialised Medical and Surgical conditions at all levels of health care and provision of safe, effective management of patients in critical care settings.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Endocrine system</li> <li>• Gland surgery</li> <li>• Oncology</li> <li>• Ear, Nose, and Throat</li> <li>• Ophthalmology</li> <li>• Neurology</li> <li>• Neurosurgery</li> <li>• Practicals</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's		

<b>Title</b>	<b>Psychiatric Nursing 3A</b>		
<b>Code</b>	<b>SNPN311</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNGN211, SNGN212, SNHP211, SNHP212, SNPR219	Co-requisites	None
<b>Aim</b>	To develop competency in the practice of care for healthy or mentally ill and mentally challenged individuals in terms of promotion of mental health throughout the life span		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction to psychiatric nursing science</li> <li>• History of mental health nursing and current models in mental health</li> <li>• Aetiology, pathology, clinical manifestation, diagnosis and nursing management of psychiatric disorders</li> <li>• Psychogeriatric conditions</li> <li>• Legal aspects in psychiatric nursing</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's		

<b>Title</b>	<b>Midwifery 3A</b>		
<b>Code</b>	<b>SNMW311</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNGN211, SNGN212, SNHP211, SNHP212, SNPR219	Co-requisites	None
<b>Aim</b>	The course is designed to develop competency in the management and practice of normal midwifery at all levels of care, identify clients with problems and refer them for expert care, to ensure that quality midwifery health care services are rendered.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction to midwifery health care</li> <li>• Application of knowledge of Anatomy and physiology related to the female reproductive system, apply related biophysical &amp; biochemical studies to midwifery science.</li> <li>• Integration of the South African Nursing Council rules, regulations of country as well as those of education &amp; training institutions.</li> <li>• Embryology, diagnosis and management of a woman, their families, during antenatal period and labor.</li> <li>• Establish between normal and abnormal midwifery practice during pregnancy and labor, refer for expert care.</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's		

<b>Title</b>	<b>Midwifery 3A</b>		
<b>Code</b>	<b>SNMW311</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNGN211, SNGN 212, SNHP211, SNHP212, SNPR219	Co-requisites	None
<b>Aim</b>	The course is designed to develop competency in the management and practice of normal midwifery at all levels of care, identify clients with problems and refer them for expert care, to ensure that quality midwifery health care services are rendered.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction to midwifery health care</li> <li>• Application of knowledge of Anatomy and physiology related to the female reproductive system, apply related biophysical &amp; biochemical studies to midwifery science.</li> <li>• Integration of the South African Nursing Council rules, regulations of country as well as those of education &amp; training institutions.</li> <li>• Embryology, diagnosis and management of a woman, their families, during antenatal period and labor.</li> <li>• Establish between normal and abnormal midwifery practice during pregnancy and labor, refer for expert care.</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%,		

	Final 3 hour theory exam 60%
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>Pharmacology</b>		
<b>Code</b>	<b>SNPC311</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	To develop a broad –based knowledge of the drugs that are used in various specialized conditions that affect all age groups.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Cholinergic, adrenergic and CNS stimulants</li> <li>• Anaesthetic drugs <ul style="list-style-type: none"> <li>○ General anaesthetics</li> <li>○ Local anaesthetics</li> <li>○ Resuscitation anaesthetics</li> </ul> </li> <li>• Anticonvulsant drugs</li> <li>• Antiparkinsonian and Antimyathenic drugs</li> <li>• Antianginal drugs</li> <li>• Antilipemic drugs</li> <li>• Pituitary, Thyroid and Parathyroid drugs</li> <li>• Male and female hormonal drugs</li> <li>• Antidiabetic drugs and obesity</li> <li>• Corticosteroids and immunosuppressant drugs</li> <li>• Antifungal and anthelmintic drugs</li> <li>• Antiviral drugs</li> <li>• Antigout drugs</li> <li>• Antiathritic drugs and skeletal muscle relaxant drugs</li> <li>• Antineoplastic drugs</li> <li>• Ophthalmic drugs</li> <li>• Otic drugs</li> <li>• Topical drugs (skin, nose, ears)</li> <li>• Hormones and reproduction</li> <li>• Hormones and metabolism: calcitonin, osteoporosis</li> <li>• Drugs affecting the kidneys and renal function</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (20% tests, 10% Assignments 10% Presentations) 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's		

<b>Title</b>	<b>General Nursing Science 3B</b>		
<b>Code</b>	<b>SNGN312</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNGN211 and SNGN212	<b>Co-requisites</b>	None
<b>Aim</b>	To develop knowledge and competency in the management of specialized care for: Gynecological, dermatological, metabolic and auto-immune conditions.		

	To acquire ability to examine, diagnose, treat and evaluate care for the adult and elderly person, orthopedic care and preparation and care of a patient following kidney surgery.
<b>Content</b>	<ul style="list-style-type: none"> <li>• Gynecology</li> <li>• Dermatology</li> <li>• Metabolic and auto-immune conditions</li> <li>• Adult and elderly person</li> <li>• Orthopedic care</li> <li>• Invasive renal surgery</li> <li>• Practicals</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (20% tests, 5% Assignments 5% Presentations, 10% case study) 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>Psychiatric Nursing 3B</b>		
<b>Code</b>	<b>SNPN312</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNSC211, SNSC212, SNSC231, SNSC232	Co-requisites	None
<b>Aim</b>	To prepare a well-rounded learner of nursing who can apply the knowledge, understanding and caring of individuals with or without psychiatric disorders or with physical and mental challenges.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Therapeutic modalities: milieu therapy, electroconvulsive therapy, therapeutic self and therapeutic use of self.</li> <li>• Psychopharmacological/psychotropic chemotherapy (minor and major tranquilizers, antidepressants, mood stabilizers)</li> <li>• Therapeutic response, side effects and nursing intervention related to the presenting problem</li> <li>• Alternative approaches of treatment: Indigenous methods of treating mental illness</li> <li>• Classify mentally challenged children and various assessment tools</li> <li>• Identify features of mentally challenged children</li> <li>• Preventive measures at primary, secondary and tertiary levels</li> <li>• Psychosocial effects of mentally challenged child</li> <li>• Principles and methods of teaching the child</li> <li>• Stimulation of all senses</li> <li>• Nursing care of a child with specific problems</li> <li>• Home care vs institutional care</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's		

<b>Title</b>	<b>Midwifery 3B</b>		
<b>Code</b>	<b>SNMW312</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNGN211, SNGN212, SNHP211, SNHP212, SNPR219, SNMW311	Co-requisites	None
<b>Aim</b>	The course is designed to develop competency in the management and practice of normal midwifery at all levels of care, identify clients with problems and refer them for expert care, to ensure that quality midwifery health care services are rendered.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction to midwifery health care related to puerperium and child care.</li> <li>• Application of knowledge of Anatomy and physiology related to the female reproductive system, apply related biophysical &amp; biochemical principles to puerperium and child care.</li> <li>• Integration of the South African Nursing Council rules regulations laws of country and policies of education &amp; training institutions.</li> <li>• Diagnosis of and management of women, children and their families</li> <li>• Establish between normal and abnormal midwifery practice during puerperium child care, refer for expert care.</li> </ul>		
<b>Assessment</b>	Continuous assessment 40%, Final 3 hour theory exam 60%		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's		

<b>Title</b>	<b>Ethos and Professional practice</b>		
<b>Code</b>	<b>SNEP111</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Aim</b>	To inculcate the ethical and moral codes of the nursing profession.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• The learner will understand and integrate:</li> <li>• History, philosophy, essence of nursing, nursing values, ethical codes and the principles in nursing profession</li> <li>• Ethos of nursing and professionalization which includes the dynamics, aspects of professional practice, Legislation and control</li> <li>• Continuing professional education development and health behavior</li> <li>• Professional and labor organizations for nursing, their characteristics, aims, functions and related legislation</li> <li>• Health care management</li> <li>• Management approaches and principles</li> <li>• Methods and techniques for the management of a nursing unit and primary health care services</li> <li>• Human resource management</li> </ul>		

	<ul style="list-style-type: none"> <li>• Leadership</li> <li>• Safe guarding the patients' wellbeing and environment e.g. infection control</li> <li>• Teaching principles and methods for clinical and methods and patient teaching and teaching of lay workers</li> <li>• Counselling and negotiation skills</li> </ul>
<b>Assessment</b>	Tests 20%, Assignments 5%, Presentations 5%, Case study 10% Final 3 hour exam 60%
<b>DP Requirement</b>	40% Continuous Assessment Mark, 80% Attendance at practical sessions

<b>Title</b>	<b>Psychiatric Nursing 4A</b>		
<b>Code</b>	<b>SNPN411</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNPN311, SNPN312, SNGN311, SNGN312, SNPR319	Co-requisites	None
<b>Aim</b>	To develop competency in comprehensive mental health nursing at primary secondary and tertiary levels of mental health care of individuals at all age groups		
<b>Content</b>	<ul style="list-style-type: none"> <li>• The approach applied in community psychiatry</li> <li>• Steps carried out in the establishment of a new community psychiatric service and family therapy</li> <li>• Evaluation of a community psychiatric service and research in community psychiatry</li> <li>• Child psychiatric disorders</li> <li>• Factors influencing the utilization of services</li> <li>• Maintenance of professional confidentiality.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (20% tests, 5% Assignments 5% Presentations, 10% case study) 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's		

<b>Title</b>	<b>Midwifery 4A</b>		
<b>Code</b>	<b>SNMW411</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNGN311, SNGN312, SNMW311, SNMW312, SNPR319	Co-requisites	None
<b>Aim</b>	<p>To extend and integrate the knowledge of abnormalities of anatomy and physiology in the management of the woman who has abnormal condition e.g. pregnancy Induced hypertension, multiple pregnancy and obstructed labour.</p> <p>To develop competency in the diagnosis and management of abnormalities in pregnancy and labour.</p>		

<b>Content</b>	<ul style="list-style-type: none"> <li>• Application of knowledge of Anatomy and physiology when studying abnormalities which affect the female reproductive system.</li> <li>• Prevention, diagnosis and management of abnormal conditions affecting the woman during pregnancy e.g. diseases, infections, obstructed labour and obstetrical emergencies.</li> <li>• Integration of the South African Nursing Council rules and regulations, laws of the country and policies of education and training institutions.</li> </ul>
<b>Assessment</b>	Theory: 40% Continuous Assessment Mark (tests, Assignments Presentations, and case studies) 60% Formal end of module exam (3 hours) Practical: Continuous assessment: 40%, practical examination: 60%.
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>Psychiatric Nursing 4B</b>		
<b>Code</b>	<b>SNPN412</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNPN311, SNPN312, SNGN311, SNGN312, SNPR319	Co-requisites	None
<b>Aim</b>	To develop competency in comprehensive mental health nursing at primary secondary and tertiary levels of mental health care of individuals at all age groups		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Individual and group relationship</li> <li>• The interactive process</li> <li>• Contribution of group development</li> <li>• Effectiveness and productivity characteristic in a group</li> <li>• Assessment of a crisis</li> <li>• Identification of supportive systems</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (20% tests, 5% Assignments 5% Presentations, 10% case study) 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's		

<b>Title</b>	<b>GENERAL NURSING 411</b>		
<b>Code</b>	<b>SNGN411</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNGN311, SNGN312, SNMW311, SNMW312, SNPR319	Co-requisites	None
<b>Aim</b>	To equip student with competencies, experiences, knowledge and skills in the effective management of nursing unit and		



	health care services at all levels, aiming at providing quality patient care of all types of patients in different settings using specialized and scientific knowledge and skills.
<b>Content</b>	<ul style="list-style-type: none"> <li>• Introduction to nursing management</li> <li>• Concepts in administration and management</li> <li>• Basic principles of administration and management</li> <li>• Generic administrative processes</li> <li>• Applied administration</li> <li>• Role and functions of the nurse in charge of a health service unit</li> <li>• Policy and decision making</li> <li>• Organisation and management of a nursing unit (e.g. personnel management)</li> <li>• Specific administrative aspects concerning provision of patient care</li> </ul>
<b>Assessment</b>	Theory: 40% Continuous Assessment Mark (tests, Assignments Presentations, and case studies) 60% Formal end of module exam (3 hours) Practical: Continuous assessment: 40%, practical examination: 60%.
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>GENERAL NURSING 412</b>		
<b>Code</b>	<b>SNGN412</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNGN311, SNGN312, SNMW311, SNMW312, SNPR319	Co-requisites	None
<b>Aim</b>	To equip student with competencies, experiences, knowledge and skills in the effective management of nursing unit and health care services at all levels, aiming at providing quality patient care of all types of patients in different settings using specialized and scientific knowledge and skills.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Method and strategies of teaching in clinical practice</li> <li>• Audio vision Aids, selection, use and maintenance</li> <li>• Factors in nursing settings that affect teaching and learning</li> <li>• Planning for teaching including orientation programme, in-service education, client/ patient teaching,</li> <li>• Teaching of nursing skills to junior nursing students</li> </ul>		
<b>Assessment</b>	Theory: 40% Continuous Assessment Mark (tests, Assignments Presentations, and case studies) 60% Formal end of module exam (3 hours)		

	Practical: Continuous assessment: 40%, practical examination: 60%.
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>Midwifery 4B</b>		
<b>Code</b>	<b>SNMW412</b>	<b>Department</b>	<b>Nursing Science</b>
<b>Prerequisites</b>	SNGN311, SNGN312, SNMW311, SNMW312, SNPR319	Co-requisites	None
<b>Aim</b>	<p>To extend and integrate the knowledge of abnormalities of puerperium, and the new-born/child, such as puerperal sepsis and prematurity and its complications</p> <p>To develop competency in the diagnosis, monitoring and management of abnormalities during puerperium and of the neonate and the child.</p>		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Application of knowledge of Anatomy and physiology in the study of abnormal conditions which affect the woman and the child.</li> <li>• Prevention, diagnosis and management of abnormal conditions affecting the woman during puerperium, the baby/child e.g. Post-partum haemorrhage, hypoxic ischaemic encephalopathy.</li> <li>• Integration of the South African Nursing Council rules and regulations as well as the laws of the country.</li> </ul>		
<b>Assessment</b>	<p>Theory: 40% Continuous Assessment Mark (tests, Assignments Presentations, and case studies)</p> <p>60% Formal end of module exam (3 hours)</p> <p>Practical</p> <p>Continuous assessment: 40%, practical examination: 60%.</p>		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's		

### PROGRAMME RULES (B Cur)

To register for 3<sup>rd</sup> level modules a student shall have passed all 1<sup>st</sup> year modules. To register for 4<sup>th</sup> level modules a student shall have passed all 2<sup>nd</sup> level modules. In order to progress the subsequent level major a candidate shall complete the necessary requirements and obtain a pass mark in the preceding level. Where a support course or module is a pre-requisite a candidate shall be required to complete and pass the pre-requisite course or module in order to register the specific module.

### EXPERIENTIAL LEARNING (CLINICAL EXPERIENCE)

A total of four thousand (4000) hours experiential learning must be completed (SANC Regulation R425)

Practical work shall be undertaken at health related institutions approved by the SANC. Minimum hours for experiential learning shall be based on the directive set by the SANC. A learner shall keep a record of his/her clinical performance as prescribed for each level of study. This includes workbooks for General Nursing, Community Health Nursing, Midwifery, Psychiatry Nursing, Research project report, SANC Regulations file. Such records shall be signed by a professional nurse responsible for the clinical experience and will serve as legal evidence of experiential learning. Learner records for each level of the programme must be submitted complete, by 30 September each year for evaluation. Total attendance at SANC approved clinical facilities for prescribed clinical experience is compulsory.

### **B CUR (E et A)**

This is a post registration degree programme for professional nurses, and is registrable with the South African Nursing Council. The degree is offered over a minimum of 3 years full-time or 4-5 years part-time study.

**Admission requirements:** Full matriculation exemption and current registration with the South African Nursing Council as a general nurse and midwife

**Option 1:** Nurse educator and nurse manager

**Option 2:** Community health nurse and nurse manager

## **STAFF**

Head of Department	T Jili, BScHons (UNIZULU), MSc (Atlanta, USA), PhD (WITS), MSAIP, Pr. Phys
Associate Professors	Msomi, BScHons, MSc, PhD (UKZN), PGDHE (UKZN) SS Ntshangase, BScHons, MSc (UNIZULU), PhD (UCT), MSAIP, PGDIHE (UKZN)
Senior Lecturer	CL Ndlangamandla, BScHons, MSc, PhD (UNIZULU) MSAIP, Pr.Phys
Lecturers	B Kibirige, BSc (Eng) (MUK), MSc (Eng) (WITS), PhD (Eng) (WITS), PM_ISES, MSAIP
nGAP Lecturer	SS Nkosi, BScHons, MSc, PhD (UNIZULU), MSAIP, PGDHE (UKZN)
Senior Lab Assistant	PN Biyela, BScHons, MSc, PhD (UNIZULU), MSAIP, PGDHE (UKZN) NP Chonco, BScHons, MSc (UNIZULU), MSAIP PS Mkwae BScHons MSc(UNIZULU)
Temporal Senior Lab Assistant	T Mpanza BScHons, MSc (UNIZULU)
Laboratory Technician	NS Khanyile, Computer hardware and Software A+, N+ (Mega Training)
Secretary	NC Mothapo, Dip (Sec) (Working World)

<b>Title</b>	<b>Classical mechanics and properties of matter</b>		
<b>Code</b>	<b>4PHY111</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	The module is meant for entry level B.Sc. and contains fundamental concepts in Physics and Engineering that prepares the student for later study in more advanced fields in the Physical Sciences. It contains basic concepts in mechanics, waves, optics and thermodynamics.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Statistical concepts: Probability, distributions, histograms, standard deviation, propagation of errors. Units and measurement: Dimensions, SI-system of units, basic measurements in physics.</li> <li>Mechanics: Forces, moments, couples, Newton's laws, circular motion, momentum, oscillations, momentum and impulse.</li> <li>Heat and thermodynamics: Mechanisms of heat transfer, heat capacity, phase changes, gases.</li> <li>Waves: Sound waves, light and light sources, laws of refraction, diffraction and reflection.</li> <li>Practical: Laboratory sessions on precision calculations in experimental results, forces, mechanics, optics heat and properties of matter.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>An understanding of statistical concepts for data analysis and presentation.</li> <li>An understanding of basic mechanics concepts, laws of Newton and their practical application.</li> <li>The understanding of circular motion, its mathematical representation and solving of problems associated with repetitive circular motion.</li> </ul>		

	<ul style="list-style-type: none"> <li>An understanding of wave concepts, modes of propagation and associated phenomena inside a material medium.</li> <li>Problems.</li> <li>Learners should be able to identify most of laboratory instruments used in the level 1 laboratory and use these properly to obtain meaningful results</li> <li>Learners must be able to write simple scientific reports commensurate with level 1 B.Sc.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and Project work

<b>Title</b>	<b>Nuclear physics, electromagnetism and modern physics</b>		
<b>Code</b>	<b>4PHY112</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	The module is meant for entry level B.Sc. and contains fundamental concepts in Physics and Engineering that prepares the student for later study in more advanced fields in the Physical Sciences. It contains basic concepts in electricity, nuclear physics and modern physics.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Electricity and Magnetism: Coulomb's law, conductors and insulators. The electric field. Gauss' law. Potential, electrical potential energy, line integral of electric field, Capacitance, dielectrics and properties of dielectrics, Electric circuits. Magnetic field and magnetism, motion of charges particles through magnetic fields, the cyclotron. Ampere's law. Induced electromotive force, The R-L circuit and the L-C circuit.</li> <li>Magnetic properties of matter, materials, permeability, molecular theory. Magnetization and susceptibility. Hysteresis. Magnetic field of the earth. Magnetic circuits.</li> <li>Atomic Physics and radioactivity: Quantum theory of radiation. Wien and Stefan's laws. Planck's radiation formula. Radioactivity, natural decay series. Detectors of radiation, Nuclear reactions, conservation laws, reaction process, proton-induced, neutron-induced and other reactions. Q-values, alpha-, beta- and gamma-decay. Nuclear binding energy. Fission and fusion. Reactors, nuclear fuel, breeders.</li> <li>Cosmic radiation and fundamental principles.</li> <li>Practical: Laboratory sessions on precision calculations in experimental results, forces, mechanics, optics heat and properties of matter.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>An understanding of statistical concepts for data analysis and presentation.</li> <li>An understanding of basic in static electricity, natural phenomena such as lightning, and the principles of machines based on static electricity concepts such as Van De Graaf Generators.</li> </ul>		

	<ul style="list-style-type: none"> <li>An understanding of electric current and its effects (such as heating)</li> <li>The generation of electricity (Faraday's law, Lenz's law, etc.)</li> <li>A learner should understand the basic concepts of radioactivity, constituents of the nucleus and the effect of radiation.</li> <li>Learners should be able to solve problems related to theory taught.</li> <li>Learners should be able to identify most of laboratory instruments used in the level 1 laboratory and use these properly to obtain meaningful results</li> <li>Learners must be able to write simple scientific reports commensurate with level 1 B.Sc.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork

<b>Title</b>	<b>Classical mechanics and properties of matter for Biological sciences</b>		
<b>Code</b>	<b>4PHY121</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	This is a non-calculus module meant for Biologists, Medical scientists and those not following calculus based physics. The aim of the module is to encourage learners to have an appreciation of the physical world surrounding them, an understanding of principles governing the physical world as well as skills in handling and understanding the operation of general laboratory instruments most likely to be used in their future careers.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Kinematics: Displacement, distance. Vectors and scalars. Motion in one and two dimensions – circular and projectile motion.</li> <li>Dynamics: Concepts, inertia, momentum, force, weight. Newton's three laws of motion. Friction. Rotational motion.</li> <li>Thermodynamics: temperature. First law. Heat capacity. Latent heat. Heat interchange. Radiation of heat by human body.</li> <li>Properties of solids and liquids: Thermal expansion. Elasticity. Viscosity. Diffusion, osmosis, surface tension. Bernoulli's law.</li> <li>Waves and sound: Velocity of waves in elastic media. Intensity and level of intensity. Doppler effect. Ultrasonic waves and applications.</li> <li>Photometry: Fundamental quantities. Radiation energy. Light flux, light intensity, candela, illumination, Lambert's law.</li> <li>Geometrical Optics: Laws of reflection and refraction. Lenses, power of a lens. Optical systems, Lens defects. The eye and eye defects. Optical instruments: magnifying glass, microscope.</li> <li>Physical Optics: Interference, coherence. Diffraction, single and double slits. Gratings. Polarization: reflection and double reflection, polarimeter. Resolving power of optical instruments. Special microscopes: (polarization, ultra – violet, interference, phase-contrast).</li> </ul>		

	<ul style="list-style-type: none"> <li>• Practical: Laboratory sessions on precision calculations in experimental results, forces, mechanics, optics heat and properties of matter.</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ An understanding of statistical concepts for data analysis and presentation.</li> <li>▪ An understanding of basic mechanics concepts, laws of Newton and their practical application.</li> <li>▪ The understanding of circular motion, its mathematical representation and solving of problems associated with repetitive circular motion.</li> <li>▪ An understanding of wave concepts, modes of propagation and associated phenomena inside a material medium.</li> <li>▪ Learners should be able to identify most of laboratory instruments used in the level 1 laboratory and use these properly to obtain meaningful results</li> <li>▪ Learners must be able to write simple scientific reports commensurate with level 1 for the biological sciences</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>Nuclear physics, electromagnetism and modern physics for Biological sciences</b>		
<b>Code</b>	<b>4PHY122</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	The aim of this module is to give learners the necessary grounding in physics for the further studies in biological and earth sciences		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Electrostatics: Coulomb's law. Electrocardiogram. Dielectric media, electric polarization, induction field in a dielectric medium.</li> <li>• Electrodynamics: Electric current and resistance. Ohm's law. Temperature dependence of resistance. Circuits. Potentiometer.. Electricity. Electrical energy Joule's law. Electrical power. Ionic conduction. Chemical effect of electric current. Conduction by gasses. Applications.</li> <li>• Electromagnetism: Magnetic induction and flux. Force on moving charges in a magnetic field. Measurement of blood velocity using electromagnetic flow meters. Electrical instruments and measurements. Laws of Faraday and Lenz.</li> <li>• Alternating current: Generation. A C circuit with resistance, capacitance and inductance. Transformer. Phases.</li> <li>• Atomic physics: Rutherford-Bohr atom. Absorption and emission of energy by the atom. Stationary orbits and energy levels. Spectral lines of the hydrogen atom. Black-body radiation. Photo-electric effect and applications. Photomultipliers and stimulation emission of radiation. Lasers.</li> <li>• X-Rays: Production of X-rays, continuous and characteristic spectra. Absorption. Medical applications. Diagnosis and therapy. Fluoroscope and image intensifier. Wave-particle duality e.g. light</li> </ul>		

	<p>and matter. De Broglie waves. Compton effect. Electron microscope. Radioactivity: Natural radioactivity. Radioactive decay, activity, disintegration constant, half-life. Nuclear reactions. Production of radioactive isotopes. Medical applications.</p> <ul style="list-style-type: none"> <li>• Practical: Laboratory sessions on precision calculations in experimental results, forces, mechanics, optics heat and properties of matter.</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ An understanding of statistical concepts for data analysis and presentation.</li> <li>▪ An understanding of basic in static electricity, natural phenomena such as lightening, and the principles of machines based on static electricity concepts such as Van De Graaf Generators.</li> <li>▪ An understanding of electric current and its effects (such as heating)</li> <li>▪ The generation of electricity (Faraday's law, Lenz's law, etc.)</li> <li>▪ A learner should understand the basic concepts of radioactivity, constituents of the nucleus and the effect of radiation.</li> <li>▪ Learners should be able to solve problems related to theory taught.</li> <li>▪ Learners should be able to identify most of laboratory instruments used in the level 1 laboratory and use these properly to obtain meaningful results</li> <li>▪ Learners must be able to write simple scientific reports commensurate with level 1 for biological sciences.</li> </ul>
<b>Assessment</b>	<p>40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)</p>
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork</p>

<b>Title</b>	<b>Elementary physics for Consumer Sciences</b>		
<b>Code</b>	<b>4PHY131</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	The aim of this module is to give learners the necessary grounding in physics for the further study in consumers sciences		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Mechanics: Units and measurements. Vectors, Pressure, kinematics, levers and center of gravity, work energy and power and machines.</li> <li>• Heat and molecular structure</li> <li>• Heat energy, expansion, properties of gases and molecular structure, transfer of heat energy, change of state</li> <li>• Wave motion, light and sound:</li> <li>• Waves, reflections and shadows, refraction, thin lenses and curved mirrors, optical instruments, electromagnetic spectrum, sound.</li> <li>• Electricity</li> <li>• Magnetism, electric circuits, magnetic effects of an electric current, Energy and power, Electromagnetic induction</li> <li>• Radioactivity</li> </ul>		



	<ul style="list-style-type: none"> <li>• Radiation counters, ionizing radiation, nature of <math>\alpha</math>-, <math>\beta</math>- and <math>\gamma</math>-radiation and the mechanism of emissions, Radioactive sources, radioactive decay, safety precautions and uses.</li> <li>• Practical: Laboratory sessions on precision calculations in experimental results, forces, mechanics, optics, heat and properties of matter and electricity.</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ An understanding of statistical concepts for data analysis and presentation.</li> <li>▪ An understanding of basic mechanics concepts, laws of Newton and their practical application.</li> <li>▪ The understanding of circular motion, its mathematical representation and solving of problems associated with repetitive circular motion.</li> <li>▪ An understanding of wave concepts, modes of propagation and associated phenomena inside a material medium.</li> <li>▪ An understanding of basic concepts in electricity and magnetism</li> <li>▪ A basic understanding of nuclear physics, radiation and its effects.</li> <li>▪ Learners should be able to identify most of laboratory instruments used in the level 1 laboratory and use these properly to obtain meaningful results</li> <li>▪ Learners must be able to write simple scientific reports commensurate with level 1 for the consumer sciences</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork

<b>Title</b>	<b>Mechanics, special relativity and properties of matter.</b>		
<b>Code</b>	<b>4PHY211</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	4PHY111	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to the concepts of and theories applicable to mechanics, special relativity and properties of matter.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Mechanics</li> <li>• Motion of a particle in polar co-ordinates. Conservative fields, central forces, centre of mass coordinates. Rigid body dynamics and moments of inertia. Inverse square force and associated potential problems. Kepler's laws and planetary motion. The vibration string and the wave equation. Free, forced, coupled and damped oscillations.</li> <li>• Special relativity</li> <li>• Experimental background. The postulates of special relativity theory. The relativity of simultaneity. The Lorentz transformation equations. Relativistic addition of velocities. The Doppler effect. Relativistic momentum. The equivalence of mass and energy. Space-time diagrams. Acceleration.</li> <li>• Properties of matter</li> <li>• Atoms, molecules and states of matter. Interatomic potential theories, the Boltzmann distribution, Maxwell speed distribution,</li> </ul>		

	transport properties of gases, liquids and imperfect gases, thermal properties of solids. Defects in solids
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>An understanding of concepts and theories of mechanics, special relativity and properties of matter.</li> <li>An understanding of principles and applications of mechanics.</li> <li>An appreciation of phenomena leading to the concept of relativity.</li> <li>Understanding of basic properties of matter.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (10% practical assessments; 25% Interim test; 5% Assignments) 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork

<b>Title</b>	<b>Modern physics, photonics and waves.</b>		
<b>Code</b>	<b>4PHY212</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	4PHYS111	<b>Co-requisites</b>	None
<b>Aim</b>	This module is designed to introduce students to the concepts of and theories applicable to modern physics, photonics and waves.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Waves: One- dimensional waves. The differential wave equation. Harmonic waves. Plane waves. Spherical waves. The superposition of waves. Beats. Group velocity. Anharmonic periodic waves. Fourier analysis.</li> <li>Light: The propagation of light. Huygens's principle. Fermat's principle. The interaction of light with matter. Interference. Conditions for interference. Wavefront splitting interferometers. Young's experiment. Fresnel's biprism. Lloyd's mirror. Multiple reflections in thin dielectric films. Newton's rings. Geometrical optics. Paraxial theory. Prisms. Mirrors. Thin and thick lenses. Lens systems. Stops. Aberrations. Optical instruments.</li> <li>Modern physics</li> <li>Lasers and applications</li> <li>Theory and principles of lasers, laser applications.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>An understanding of concepts and theories of waves, photonics and laser applications.</li> <li>An understanding of principles and applications of lasers</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (10% practical assessments; 25% Interim test; 5% Assignments) 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>Electromagnetism.</b>		
<b>Code</b>	<b>4PHY222</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	4PHYS111,4PHYS112	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to the concepts of and theories applicable to electromagnetism and its applications		
<b>Content</b>	<ul style="list-style-type: none"> <li>• electromagnetism</li> <li>• Electrostatics, Gauss's law. Dipoles. Dielectric media. Phenomena related to electron levels: Introduction to metals, semi-conductors and insulators. Contact potential. Thermoelectric effects.</li> <li>• Electromagnetism: Forces on moving charges in electric and magnetic fields. Magnetic scalar potential and vector potential. Ampere's law. Faraday's law. Self-induction and mutual induction.</li> <li>• Alternating current: M L C R circuits and A-C bridges</li> <li>• Magnetism: Dia, para-and ferromagnetic materials. The magnetic circuit.</li> <li>• Applications of concepts and theories of electromagnetism</li> <li>• Transmission lines, microwaves, waveguides, electromagnetic interference.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ An understanding of concepts and theories of electromagnetism.</li> <li>▪ Understanding and applications of Gauss law.</li> <li>▪ An understanding of laws governing electrical conduction and circuits.</li> <li>▪ Understanding principles of magnetism and magnetic circuits</li> <li>▪ Understanding applications of electromagnetism.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (10% practical assessments; 25% Interim test; 5% Assignments) 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		
<b>Title</b>	<b>Quantum and Statistical Physics</b>		
<b>Code</b>	<b>4PHY311</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	4PHY212	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to the concepts and theories applicable to quantum and statistical physics		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Statistical physics</li> <li>• Statistical and Thermal Physics: The first law of thermodynamics, the second law of thermodynamics. Simple thermodynamic systems: the heat capacity of solids: the perfect classical gas; phase equilibria; the perfect quantal gas.</li> <li>• Blackbody radiation: Fermi-Dirac &amp; Bose-Einstein distributions.</li> <li>• Systems with variable particle numbers.</li> <li>• Quantum Physics</li> <li>• The foundation of quantum mechanics. The Compton effect. Wave function and probability density. Parity. Schrodinger's equation. Wave functions of particles in changing potentials. Potential barrier penetration. Time dependant wave functions and</li> </ul>		

	transition probabilities. Particles in confinements. The hydrogen atom. Quantization of angular momentum. Wave functions of atomic states. Zeeman effect. Electron spin. Atoms with more electrons - addition of angular moment. Electronic structure of the elements.
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>An understanding of concepts of probability as applicable to microsystems.</li> <li>Comprehension of the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> laws of thermodynamics and their application.</li> <li>Understanding the statistics of paramagnetics.</li> <li>An understanding of simple thermodynamic systems.</li> <li>Theories applicable to the heat capacity of solids.</li> <li>The statistics of gases classical and quantal.</li> <li>Understanding the statistics of systems with variable particle numbers.</li> <li>Understand the basic concepts and theory of quantum mechanics</li> <li>Be able to mention and discuss simple systems where quantum mechanics is applicable (and cannot be explained using classical physics)</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and project involvement

<b>Title</b>	<b>Electronic circuits and devices</b>		
<b>Code</b>	<b>4PHY321</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	4PH112	Co-requisites	None
<b>Aim</b>	This module is designed to introduce students to the concepts of and theories applicable to electronics and its applications		
<b>Content</b>	<ul style="list-style-type: none"> <li>electromagnetism</li> <li>LCR circuits: Forced oscillations. Transients.</li> <li>Alternating current theory: Power factor correction. Three-phase circuits.</li> <li>Electronics: Vacuum tubes. Semiconductors. Diodes. Rectifiers. Smoothing. Transistors. Common-emitter h-parameters. Biasing. Amplifiers. Cascading. Decoupling. Modulation and demodulation. Operational amplifier. Analogue computer. Voltage regulator. Digital devices. Logical circuits. Digital computer.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>An understanding of concepts and theories of electronics</li> <li>Understanding and applications of semiconductors.</li> <li>An understanding of laws governing electrical conduction and circuits.</li> <li>Understanding principles of magnetism and magnetic circuits</li> <li>Understanding applications of electronics.</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (10% practical assessments; 25% Interim test; 5% Assignments) 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark		

	80% Attendance at practical's and fieldwork
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<b>Title</b>	<b>Nuclear Physics and Applications.</b>		
<b>Code</b>	<b>4PHY312</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	This module is designed to introduce students to the concepts of and theories applicable to nuclear physics and its applications		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Nuclear physics</li> <li>• Molecules: The hydrogen molecule ion. Electronic configuration of some diatomic molecules. Polyatomic molecules. Molecular rotations and vibration. Electronic transitions.</li> <li>• Nuclear Structure: Nuclear properties, electric multiple moments. Nuclear forces. Scattering. Nuclear models. The shell-model. The semi-empirical mass formula. The collective model.</li> <li>• Nuclear processes: Laws of radioactive series decay. Alpha decay and barrier transmission.</li> <li>• Beta decay and neutrino hypothesis. Gamma decay. Mean lifetime of a state. Electromagnetic multiple radiation and lifetimes.</li> <li>• Cosmic radiation.</li> <li>• Elementary particles: Classes and properties. Quantum numbers and conservation laws.</li> <li>• Applications of nuclear physics</li> <li>• Radiation physics and its applications. Nuclear energy and its generation.</li> <li>• Effect of radiation on biological materials..</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ An understanding of concepts and theories of nuclear physics.</li> <li>▪ Understanding different nuclear models and arguments used to develop them.</li> <li>▪ An understanding of laws governing radioactive decay.</li> <li>▪ Understanding principles of nuclear power generation</li> <li>▪ Understanding nuclear radiation, use and shielding</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark (10% practical assessments; 30% Interim test) 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>Solid State Physics and Materials Science</b>		
<b>Code</b>	<b>4PHY322</b>	<b>Department</b>	<b>Physics and Engineering</b>
<b>Prerequisites</b>	4PHY211 4PHY212	<b>Co-requisites</b>	
<b>Aim</b>	This module is designed to introduce students to the concepts of and theories applicable to solid state physics and materials science.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Solid state physics</li> <li>• Introduction to solid state physics, XRD, crystallography, energy bands in solids, semiconductors, metals, one dimensional system.</li> <li>• Materials science</li> </ul>		

	<ul style="list-style-type: none"> <li>Types of atomic bonds; crystalline structure , X-ray diffraction, crystal defects, phase diagrams and microstructural development, kinetics of phase transformation, metals and their mechanical properties, ceramics and glasses, polymers and composites, electrical properties of materials, semiconductors, magnetic materials, degradation and failure of materials, materials processing and selection.</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>An understanding of types of bonds and how these lead to different properties.</li> <li>How crystal structure is determined using XRD.</li> <li>How to read phase diagrams and use them to predict microstructure.</li> <li>An appreciation of different properties of matter.</li> <li>A comprehension of how materials degrade under different environments and how this can be prevented</li> <li>Ability to process and select materials based on their properties for use in a modern technology.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (10% practical assessments; 25% Interim test; 5% Assignments) 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork

**STAFF**

**Acting HOD**

**Lecturers**

N Morojele-Mathibeli, MSc (Southampton)

TE Buthelezi, MSc (UNIZULU)

S Mlambo, PhD (Pretoria)

J Chizanga, MA (Stellenbosch)

S Naras, BScHons (UDW)

S Ntenti, BSc (WITS), BScHons (UJ)

Komi Afassinou, PhD (UKZN)

M Ramulindo, MSc (UNIZULU)

Q Schutte, MSc (UNIZULU)

<b>Title</b>	<b>Science Foundation English Literacy 1</b>		
<b>Code</b>	<b>4FLT111</b>	<b>Department</b>	<b>Science Access</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	The course aims to equip students with essential skills to communicate effectively and to write proficiently using scientific discourse and textual material.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Parts of speech.</li> <li>• Common errors in English.</li> <li>• Dictionary and Thesaurus entries.</li> <li>• Spelling.</li> <li>• Referencing.</li> <li>• Curriculum vitae.</li> <li>• Presentation of a scientific paper.</li> <li>• Presentation of an autobiography</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ The ability to write sentences coherently</li> <li>▪ The full understanding of the various parts of speech</li> <li>▪ The ability to define the four sentence types: simple, compound, complex, and compound-complex</li> <li>▪ The ability to write paragraphs in which the sentences support the main idea and are in an appropriate logical order.</li> <li>▪ The knowledge of how to reference and cite work consulted</li> <li>▪ The ability to reformulate and synthesize information avoiding plagiarism</li> <li>▪ The ability to research and seek information as appropriate to specific tasks</li> <li>▪ The ability to communicate effectively in writing by collecting, recording and organizing information</li> <li>▪ The ability to understand what is represented in visual literacy (cartoons and graphs)</li> <li>▪ The ability to interpret details in and draw conclusions using a variety of strategies before, during, and after reading, viewing, or listening to increase comprehension and recall</li> <li>▪ The ability to communicate effectively, using language skills in the mode of oral communication</li> </ul>		

	<ul style="list-style-type: none"> <li>▪ The ability to record, organize, and store information they read, hear, or view</li> <li>▪ The ability to examine controversial topics, working effectively with others as a member of a team</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (25% Oral assessments; 62.5% Test; 12.5% Assignment) 60% Formal end of module exam (2 hours) 60% Formal end of module exam (2 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>Science Foundation English Literacy 2</b>		
<b>Code</b>	<b>4FLT112</b>	<b>Department</b>	<b>Science Access</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	The course aims to develop skills in reading, writing, speaking, and understanding English to enable students to apply language to scientific discourse and textual material.		
<b>Content</b>	<ul style="list-style-type: none"> <li>• Punctuation.</li> <li>• Tense forms.</li> <li>• Research Report.</li> <li>• Comprehension.</li> <li>• Essay Writing (biographical essay).</li> <li>• Forum discussions.</li> <li>• - Public speaking.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ The ability to write sentences coherently</li> <li>▪ The full understanding the different tense forms</li> <li>▪ The ability to communicate effectively in writing by collecting, recording and organizing information</li> <li>▪ The ability to record, organize, and store information they read, hear, or view</li> <li>▪ The ability to interpret details in and draw conclusions using a variety of strategies before, during, and after reading, viewing, or listening to increase comprehension and recall</li> <li>▪ The ability to understand what is represented in visual literacy (cartoons and graphs)</li> <li>▪ The ability to write paragraphs in which the sentences support the main idea and are in an appropriate logical order.</li> <li>▪ The ability to reformulate and synthesize information avoiding plagiarism</li> <li>▪ The knowledge of how to reference and cite work consulted</li> <li>▪ The ability to research and seek information as appropriate to specific tasks</li> <li>▪ The ability to communicate effectively, using language skills in the mode of oral communication</li> <li>▪ The ability to examine controversial topics, working effectively with others as a member of a team</li> </ul>		
<b>Assessment</b>	40% Continuous Assessment Mark		



	(25% Oral assessments; 37.5% Test; 37.5% Assignment) 60% Formal end of module exam (2 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's

<b>Title</b>	<b>Foundation Biology</b>		
<b>Code</b>	<b>4FBL119</b>	<b>Department</b>	<b>Science Access</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	This module aims to reinforce fundamental principles and concepts in Biology.		
<b>Content</b>	<ul style="list-style-type: none"> <li>● <b>Introduction:</b> What is biology? Why is biology important? Levels of biological organization.</li> <li>● <b>Building blocks of life:</b> Carbohydrates, lipids, proteins and enzymes.</li> <li>● <b>Origin of life/Evolution:</b> Theories of Evolution, Darwin current concepts and evolution of behavior.</li> <li>● <b>Cytology:</b> Cells as basic unit of life. The cell theory. Prokaryotes versus eukaryotes. Animal versus plant cell. Cell components and their functions. Types of transport across the cell membrane. Cells and tissues.</li> <li>● <b>Genetics:</b> DNA and genes, the cell cycle, mitosis, meiosis, what is a gene? Heredity and Mendel's work.</li> <li>● <b>Taxonomy:</b> Binomial Nomenclature, Linnaean Taxonomy.</li> <li>● <b>Photosynthesis:</b> What is photosynthesis? Light dependent reactions.</li> <li>● <b>Cellular respiration:</b> Types of cellular respiration, Aerobic and Anaerobic respiration.</li> <li>● <b>Plant water relations:</b> Theory of water movement, xylem and phloem transport.</li> <li>● <b>Homeostasis:</b> The importance of homeostasis, Regulatory mechanism (negative and positive feedback mechanism), thermoregulation, osmoregulation, sugar homeostasis and plant homeostasis.</li> <li>● <b>Ecology:</b> What is ecology? Density and distribution of population, population parameters, environment and the ecological niche concept, ecological succession, climate and the biosphere.</li> <li>● <b>Conservation biology / Environmental awareness:</b> Biodiversity and natural ecosystems.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ Students will be able to demonstrate both a theoretical and a practical mastery of biology.</li> <li>▪ Students will demonstrate an in-depth understanding of fundamental biological concepts including cell biology, genetics, evolution and ecology.</li> <li>▪ To develop critical thinking and problem-solving skills.</li> <li>▪ Students will be able to effectively communicate scientific ideas in both written and oral formats.</li> </ul>		

	<ul style="list-style-type: none"> <li>Students will develop practical scientific skills; demonstrate in-depth understanding of the proper use and care of microscopes and other laboratory equipment.</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 90% Attendance at lectures and practical's

<b>Title</b>	<b>Foundation Chemistry</b>		
<b>Code</b>	<b>4FCH119</b>	<b>Department</b>	<b>Science Access</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	This module aims to reinforce fundamental principles and concepts in chemistry.		
<b>Content</b>	<ul style="list-style-type: none"> <li><b>Basic Concepts:</b> Dalton's theory of the atom; elements, compounds and mixtures; sub-atomic particles; atomic number, mass number; isotopes; relative atomic mass; the periodic table.</li> <li><b>Naming of compounds:</b> Law of definite composition; writing formulae for ionic and molecular compounds; naming ionic and molecular compounds; formula and molecular mass; percentage composition.</li> <li><b>The mole concept:</b> empirical formula; balancing of chemical equations; mole calculations based on chemical equations; limiting reactants; percentage yield.</li> <li><b>Solutions:</b> concentration and dilution of solutions.</li> <li><b>Gases:</b> ideal gases; the ideal gas equation; stoichiometry involving gases; Dalton's Law of Partial Pressures.</li> <li><b>Redox Reactions:</b> oxidation numbers; oxidising and reducing agents; balancing of redox equations.</li> <li><b>Types of Chemical Reactions:</b> combination, decomposition, displacement and disproportionation reactions: classification and examples; electrolytes and non-electrolytes.</li> <li><b>Precipitation Reactions:</b> solubility rules; ionic equations; calculations of amount of precipitate formed.</li> <li><b>Acids and bases:</b> Bronsted acids and bases; strength of acids and bases; neutralisation reactions; volumetric analysis.</li> <li><b>Equilibrium:</b> Chemical equilibrium; Le Chatelier's Principle; Equilibrium Constant.</li> </ul>		
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>Understand some of the general principles of chemistry through independent and cooperative learning</li> <li>Make correct and careful experimental observations and measurements</li> <li>Report and interpret upon experimental data in written and oral form</li> <li>Know what a variety of pieces of chemical apparatus are used for and be able to use them safely and correctly when carrying out a laboratory experiment</li> </ul>		

	<ul style="list-style-type: none"> <li>Perform numerical calculations in chemistry and present the reasoning behind their answer in a clear and accurate way</li> <li>Read, listen to and follow instructions carefully and correctly</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 90% Attendance at lectures and practical's

<b>Title</b>	<b>Foundation Mathematics</b>		
<b>Code</b>	<b>4FMH119</b>	<b>Department</b>	<b>Science Access</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	The aim of this module is to give learners the necessary grounding and reinforce fundamental principles and concepts in mathematics for further study of the subject.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Basic Set Theory, Real Numbers and Basic Algebraic Concepts:</li> <li>The concept of a set and notation, union, intersection, complement, universal set and special sets. The real number system and the number line. Various groups/types of real numbers and their properties in terms of addition, multiplication and rising to a power (and their inverses). Mathematical induction as a property of natural numbers. Arithmetic and algebraic expressions, sum, difference, product, quotient, like and unlike terms, and factorization. Rational numbers (fractions, ratios, proportion, decimal fractions). Substitution and changing the subject of a formula. Concept of rationalization. Exponentials and logarithms.</li> <li>Advanced Algebra:</li> <li>Equations (linear and quadratic) and inequalities, Cartesian/cross product, relations and functions, curve sketching for linear, quadratic, cubic functions and the rectangular hyperbola. Exponential and logarithmic functions. The concept of absolute value and absolute value functions. Partial fractions. Sequences and series. Application of sequences and series in compound increase and decrease problems.</li> <li>Analytical Geometry:</li> <li>Fundamental concepts in geometry (point, line segment, straight line etc.). The rectangular system of axes (the Cartesian system of axes). The distance between two points, coordinates of a midpoint of a line segment and slope/gradient of a line. Equations of a straight line, circle, tangents to a circle and perpendicular lines. Determination of intersection of various curves on the Cartesian plane. The locus of a point.</li> <li>Trigonometry:</li> <li>Definitions of trigonometric ratios. The concept of a negative angle and trigonometric ratios of such angles. Definition of the radian measure. Trigonometric functions and their graphs. Periodicity of the sine, cosine and tangent ratios. The fundamental identity and other identities derived from it. Derivation of compound angle</li> </ul>		

	<p>formulae. Ratios of special angles. Trigonometric identities. Trigonometric equations and their general solutions.</p> <ul style="list-style-type: none"> <li>Calculus:</li> <li>Concept of a limit at a point and the limit at infinity, rules of limits. The concept of continuity and its definition. Concept of a derivative of a function, its definition and the rules of differentiation. Application of the derivative to determine minima and maxima. Introduction to the concept of integration. Integration and the area under a curve.</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>Eliminate the lack of understanding and/or misunderstanding of fundamental concepts in basic school mathematics.</li> <li>Strengthen the general mathematical foundation onto which advanced mathematical concepts can be built.</li> <li>Close the conceptual gaps between school and university mathematics; thereby helping students to pass through without too much effort.</li> <li>Kindle interest in mathematics both as a fun subject and a subject with applications in everyday life.</li> </ul>
<b>Assessment</b>	<p>40% Continuous Assessment 60% Formal end of module examination (3 hours)</p>
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark    90% Attendance at lectures and tutorials</p>

<b>Title</b>	<b>Foundation Physics</b>		
<b>Code</b>	<b>4FPH 119</b>	<b>Department</b>	<b>Science Access</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	<p>The foundation physics course is a one year long course designed to help students who did not perform very well during their matric but show the potential to succeed at the university. The course focuses more on the relationship between problem solving and conceptual understanding of physics concepts. The mathematical techniques used in the course include algebra, geometry, and trigonometry, but not calculus</p>		
<b>Content</b>	<p><b><u>1st semester</u></b></p> <p>1. Mathematical Concepts</p> <ul style="list-style-type: none"> <li>Kinematics in One Dimension</li> <li>Kinematics in Two Dimension</li> <li>Forces and Newton's Laws of Motion</li> <li>Uniform Circular Motion</li> <li>Work and Energy</li> <li>Impulse and Momentum</li> </ul>	<p><b><u>2nd semester</u></b></p> <ul style="list-style-type: none"> <li>Simple Harmonic Motion</li> <li>Electric Forces and Electric fields</li> <li>Electric potential Energy and Capacitance</li> <li>Current and Resistance</li> <li>Direct Current Circuits</li> <li>Kirchhoff Laws</li> </ul>	

<b>Outcomes</b>	<ul style="list-style-type: none"> <li>▪ An ability to compute basic quantities in mechanics and electricity.</li> <li>▪ An ability to formulate, analyze and solve a multi-level problem in mechanics and electricity.</li> <li>▪ An ability to incorporate non-ideal elements, such as friction, into computations.</li> <li>▪ An ability to apply principles of algebra and trigonometry to mechanics and electricity.</li> <li>▪ An ability to write a laboratory report</li> </ul>
<b>Assessment</b>	40% Continuous Assessment Mark (20% tests; 10% June Exam (3 hours); 5% practical's; 5% 2X Practical tests) 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 90% Attendance at lectures, practical's and tutorials

## Zoology

Associate Professors

HL Jerling, PhD (UPE)

Lecturers

L Vivier, MSc (UP), PhD (UNIZULU)

HMM Mzimela, MSc (UNIZULU), SST

SN Mpanza, MSc (UNIZULU)

NF Masikane, BScHons (UNIZULU), MSc (NMU), PhD (UKZN)

Senior Laboratory Assistants

N Nariensamy-Venkatasalu, BScHons (UNIZULU)

M Mothwa, BScHons (Limpopo)

Senior Technician

R Seabi, BScHons, (Limpopo)

Administrative Assistant

NFC Mbongwa, (Office Management & Technology) (DUT)

Laboratory Assistants

M Mhlongo

M Zondo

<b>Title</b>	<b>Introduction to Zoology I</b>		
<b>Code</b>	<b>4ZOL111</b>	<b>Department</b>	<b>Zoology</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	To provide students with a basic Introduction to General Zoology and Principles of Ecology.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Students achieving the objectives of this module will have a fundamental theoretical and practical knowledge of the following aspects of Introduction to Zoology I:</li> <li>Origin of Life &amp; Principles of Evolution</li> <li>General Taxonomy &amp; Phylogeny</li> <li>Background to Prokaryotes &amp; Eukaryotes</li> <li>Cell structure, function and division</li> <li>Mendelian Genetics</li> <li>Interactions with the environment</li> <li>The growth of populations</li> <li>Communities &amp; Ecosystems</li> <li>Pollution and Global Warming</li> <li>Land degradation &amp; a sustainable world</li> </ul>		
<b>Outcomes</b>	Students achieving the objectives of this module will have a fundamental theoretical and practical knowledge of the above aspects of Zoology.		
<b>Assessment</b>	25% Continuous Assessment Mark (16% Interim tests & 10% Practical Reports) 16% Practical Assessment 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at Practical's.		

<b>Title</b>	<b>Introduction to Zoology II</b>		
<b>Code</b>	<b>4ZOL112</b>	<b>Department</b>	<b>Zoology</b>
<b>Prerequisites</b>	Students must have attended and written the assessments for 4ZOL 111.	Co-requisites	None
<b>Aim</b>	To Continue from 4ZOL111 in presenting an overview of the study of Zoology in the sub disciplines of animal behavior, embryology and anatomy and physiology. To give students background in the above sub disciplines leading to more detailed study in subsequent years.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Students achieving the objectives of this module will have a fundamental theoretical and practical knowledge of the following aspects of Introduction to Zoology II:</li> <li>Animal behavior</li> <li>Embryology</li> <li>Introduction to animal anatomy and physiology covering: Structure and function of animal and cell tissue types, Organs and organ systems, Body cover, Homeostasis and Support and movement.</li> </ul>		
<b>Outcomes</b>	Students achieving the objectives of this module will have a fundamental theoretical and practical knowledge of the above aspects of Zoology.		
<b>Assessment</b>	25% Continuous Assessment Mark (16% Interim tests & 10% Practical Reports) 16% Practical Assessment 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at Practical's.		

<b>Title</b>	<b>Human Anatomy &amp; Physiology I</b>		
<b>Code</b>	<b>4ZOL121</b>	<b>Department</b>	<b>Zoology</b>
<b>Prerequisites</b>	None	Co-requisites	None
<b>Aim</b>	To provide students with the underlying theory of the different Human Anatomy and Physiology components and processes associated with these topics. To discuss Clinical and Pathological concepts related to these topics. Students should understand and be able to apply the practical aspects of the different Human Anatomy and Physiology topics.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Students achieving the objectives of this module will have a fundamental theoretical and practical knowledge of the following aspects of Human Anatomy and Physiology:</li> <li>Human anatomy in perspective</li> <li>Body tissues and covering</li> <li>Anatomy of the human skeleton</li> <li>Bone structure and development</li> <li>The human muscular system</li> <li>Blood composition and function</li> <li>The circulatory system</li> <li>The cardiovascular system</li> <li>Organisation, regulation and integration of the nervous system</li> </ul>		

	<ul style="list-style-type: none"> <li>Special senses including; Chemical senses – taste and smell, the Eye and vision and the Ear – hearing and balance.</li> </ul>
<b>Outcomes</b>	Students achieving the objectives of this module will have a fundamental theoretical and practical knowledge of the above aspects of Human Anatomy & Physiology.
<b>Assessment</b>	25% Continuous Assessment Mark (16% Interim tests & 10% Practical Reports) 16% Practical Assessment, 60% Formal end of module exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at Practical's.

<b>Title</b>	<b>Human Anatomy &amp; Physiology II</b>		
<b>Code</b>	<b>4ZOL122</b>	<b>Department</b>	<b>Zoology</b>
<b>Prerequisites</b>	None	<b>Co-requisites</b>	None
<b>Aim</b>	To provide students with the underlying theory of the different Human Anatomy and Physiology components and processes associated with these topics. To discuss Clinical and Pathological concepts related to these topics. Students should understand and be able to apply the practical aspects of the different Human Anatomy and Physiology topics.		
<b>Content</b>	<ul style="list-style-type: none"> <li>Students achieving the objectives of this module will have a fundamental theoretical and practical knowledge of the following aspects of Human Anatomy and Physiology:</li> <li>Respiration</li> <li>Digestion and metabolism</li> <li>Muscles and movement</li> <li>Renal system, homeostasis and osmoregulation</li> <li>Lymphatic system</li> <li>Immunology and body defense</li> <li>Reproduction: the continuation of Life</li> <li>Endocrine system</li> </ul>		
<b>Outcomes</b>	Students achieving the objectives of this module will have a fundamental theoretical and practical knowledge of the above aspects of Human Anatomy & Physiology.		
<b>Assessment</b>	25% Continuous Assessment Mark (16% Interim tests & 10% Practical Reports) 16% Practical Assessment, 60% Formal end of module exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at Practical's.		

<b>Title</b>	<b>Animal Anatomy &amp; Physiology</b>		
<b>Code</b>	<b>4ZOL211</b>	<b>Department</b>	<b>Zoology</b>
<b>Prerequisites</b>	4ZOL111 & 4ZOL112	<b>Co-requisites</b>	None
<b>Aim</b>	This course is designed to introduce students to concepts and theories applicable to components of animal anatomy and physiology.		
<b>Content</b>	Students achieving the objectives of this course will have a fundamental theoretical and practical knowledge of:		



	<ul style="list-style-type: none"> <li>● Anatomy and physiology in perspective</li> <li>● The skin, skeleton and muscular systems</li> <li>● The digestive system and nutrition</li> <li>● Internal fluids and the circulatory system</li> <li>● Homeostasis and excretion</li> <li>● Lymphatic system and immunity</li> <li>● The respiratory system</li> <li>● The nervous system and nerve impulse generation</li> <li>● Sense organs</li> <li>● The endocrine system</li> <li>● Reproduction, development and embryology</li> <li>● Practical aspects of animal anatomy and physiology</li> <li>● Introduction to evolution</li> <li>● Darwin's principles</li> <li>● 16. Currents concepts and trends in evolution</li> </ul>
<b>Outcomes</b>	<p>Students achieving the objectives of this course will have:</p> <ol style="list-style-type: none"> <li>1. A comprehensive knowledge and understanding of the anatomical structures and physiological processes associated with the components of animal anatomy and physiology covered in the course.</li> <li>2. A comprehensive knowledge and understanding of the practical aspects of the anatomical structures and physiological processes covered in the course.</li> <li>3. A comprehensive knowledge and understanding of the historical and current concepts of evolution.</li> <li>4. The ability to perform, analyse and interpret and report on practical work covered in the course.</li> </ol>
<b>Assessment</b>	<p>40% Continuous Assessment Mark (16% practical test; 10% practical reports; 16% Interim test) 60% Formal Summative end of semester exam (3 hours)</p>
<b>DP Requirement</b>	<p>40% Continuous Assessment Mark 80% Attendance in practical's and fieldwork</p>

<b>Title</b>	<b>Animal Diversity</b>		
<b>Code</b>	<b>4ZOL212</b>	<b>Department</b>	<b>Zoology</b>
<b>Prerequisites</b>	4ZOL111 & 4ZOL112	Co-requisites	None
<b>Aim</b>	To present the phylogeny, taxonomy and diversity of invertebrates and vertebrates including theories and evidence pertaining to the origin of major taxonomic groups and the phylogenetic relationships among them.		
<b>Content</b>	<p>Students achieving the objectives of this course will have a fundamental theoretical and practical knowledge of:</p> <ul style="list-style-type: none"> <li>● The architectural pattern of an animal.</li> <li>● Classification and phylogeny of animals.</li> <li>● The Protozoa, Metazoa and radiate animals.</li> <li>● The acoelomate and pseudocoelomate animals.</li> <li>● The protostome coelomate animals including the Phylum Mollusca, Annelida and Arthropoda.</li> </ul>		

	<ul style="list-style-type: none"> <li>The deuterostome coelomate animals including the Phylum Echinodermata, Hemichordata and Chordata, including the protochordates, fishes, amphibians, reptiles, birds and mammals.</li> <li>Human evolution.</li> </ul>
<b>Outcomes</b>	Students achieving the objectives of this module will: <ol style="list-style-type: none"> <li>Have a broad knowledge of the phylogeny, taxonomy and diversity of animals.</li> <li>Have a practical knowledge of the anatomy, classification and identification of the major animal groups.</li> <li>Be able to continue with the study of any animal or group of animals at post graduate level.</li> </ol>
<b>Assessment</b>	40% Continuous Assessment Mark (16% practical test; 10% practical reports; 16% Interim test) 60% Formal Summative end of semester exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of practical's and fieldwork

<b>Title</b>	<b>Animal Ecology I</b>		
<b>Code</b>	<b>4ZOL311</b>	<b>Department</b>	<b>Zoology</b>
<b>Prerequisites</b>	4ZOL212	Co-requisites	None
<b>Aim</b>	To examine the major principles of animal ecology with specific reference to theoretical and applied aspects of terrestrial and freshwater ecosystems.		
<b>Content</b>	Students achieving the objectives of this course will have a fundamental theoretical and practical knowledge of: <ul style="list-style-type: none"> <li>Levels of ecological organization, ecosystems &amp; the physical environment.</li> <li>The biosphere, global climate patterns &amp; world biomes.</li> <li>Environmental responses &amp; ecological niche.</li> <li>Population ecology, reproductive strategies, equilibrium &amp; regulation.</li> <li>Community ecology, structure, dominance, richness &amp; succession.</li> <li>Availability &amp; distribution of freshwater bodies in SA.</li> <li>Natural standing waters and lake succession.</li> <li>River hydrology, chemistry, the river continuum concept &amp; functional feeding groups.</li> <li>Floodplains, catchments &amp; inter-basin transfer schemes.</li> <li>Dams and the change from river to lake.</li> <li>Freshwater conservation, management and the Water Act.</li> </ul>		
<b>Outcomes</b>	Students achieving the objectives of this module will: <ol style="list-style-type: none"> <li>Understand the underlying theory and practice of terrestrial and freshwater ecology.</li> <li>Have a fundamental knowledge of the types and importance of different terrestrial and freshwater ecosystems in SA.</li> <li>Be able to conduct ecological research including sampling, data collection, analysis, interpretation and presentation.</li> </ol>		
<b>Assessment</b>	40% Continuous Assessment Mark (10% practical test; 10% practical reports; 16% Interim test; 5% Assignment) 60% Formal Summative end of semester exam (3 hours)		

<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of practical's and fieldwork		
<b>Title</b>	<b>Ecophysiology and Ecotoxicology</b>		
<b>Code</b>	<b>4ZOL 321</b>	<b>Department</b>	<b>Zoology</b>
<b>Prerequisites</b>	4ZOL211	Co-requisites	None
<b>Aim</b>	To examine the major physiological adaptations exhibited by animals to their environment and to develop knowledge and understanding of the principles associated with origins, assessment and significance fate and management of environmental pollutants.		
<b>Content</b>	Students achieving the objectives of this course will have a fundamental theoretical and practical knowledge of: <ul style="list-style-type: none"> <li>• Ionic and osmotic regulation.</li> <li>• Osmoregulation in aquatic and terrestrial organisms.</li> <li>• Heat, energy and metabolism.</li> <li>• Temperature regulation in animals.</li> <li>• Basic toxicological concepts and definitions.</li> <li>• Behavior of toxicants in the environment.</li> <li>• Uptake of pollutants by organism.</li> <li>• Mode of transportation and dose-effect relationships.</li> <li>• 9. Ecological Risk Assessment.</li> </ul>		
<b>Outcomes</b>	Students achieving objectives of this course will have basic understanding of how pollutants affect organisms and their habitats and the modifying effects of environmental factors on pollutant toxicity.		
<b>Assessment</b>	40% Continuous Assessment Mark (10% practical test; 10% practical reports; 16% Interim test; 5% Assignment) 60% Formal Summative end of semester exam (3 hours)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

<b>Title</b>	<b>Animal Ecology II</b>		
<b>Code</b>	<b>4ZOL312</b>	<b>Department</b>	<b>Zoology</b>
<b>Prerequisites</b>	4ZOL212	Co-requisites	
<b>Aim</b>	To examine the major principles of animal ecology with specific reference to theoretical and applied aspects of estuarine and marine ecosystems.		
<b>Content</b>	Students achieving the objectives of this module will have a fundamental theoretical and practical knowledge of: <ul style="list-style-type: none"> <li>• Classification and physical characteristics of estuaries.</li> <li>• The estuarine flora &amp; fauna.</li> <li>• Adaptation to estuarine conditions.</li> <li>• Case studies of selected South African estuaries.</li> <li>• The importance and use of estuaries.</li> <li>• Physical characteristics of the sea.</li> <li>• Zonation of the sea, tides and ocean currents</li> <li>• Rocky shore, sandy beach and open ocean ecology.</li> <li>• The major South African fisheries.</li> <li>• Fishery resource management.</li> <li>• 11. An introduction to aquaculture.</li> </ul>		

<b>Outcomes</b>	Students achieving the objectives of this course will: 1. Understand the underlying theory and practice of estuarine and marine ecology. 2. Have a fundamental knowledge of the types and importance of different estuarine and marine ecosystems in SA. 3. Have a fundamental knowledge of the types and importance of different South Africa fisheries.
<b>Assessment</b>	40% Continuous Assessment Mark (10% practical test; 10% practical reports; 16% Interim test; 5% Assignment) 60% Formal Summative end of semester exam (3 hours)
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance of practical's and fieldwork

<b>Title</b>	<b>Research Design &amp; Application</b>		
<b>Code</b>	<b>4ZOL322</b>	<b>Department</b>	<b>Zoology</b>
<b>Prerequisites</b>	4ZOL211	<b>Co-requisites</b>	4ZOL311
<b>Aim</b>	This course is designed to introduce students to research planning and design		
<b>Content</b>	Students achieving the objectives of this course will have a fundamental theoretical and practical knowledge of: <ul style="list-style-type: none"> <li>• Research Project Design <ul style="list-style-type: none"> <li>○ Philosophy of science</li> <li>○ Critical thinking in Science</li> <li>○ Research Methodology</li> <li>○ Importance of planning a research project</li> <li>○ Designing and writing a research proposal</li> <li>○ Scientific writing</li> </ul> </li> <li>• Research Project Planning and Application <ul style="list-style-type: none"> <li>○ Literature survey of research project</li> <li>○ Writing a research proposal</li> <li>○ Research seminar of research project</li> <li>○ Implement research methodology</li> <li>○ 5. Fieldwork and data collection</li> </ul> </li> </ul>		
<b>Outcome</b>	Learners achieving the objectives of this course will have: <ol style="list-style-type: none"> <li>1. A comprehensive knowledge and understanding of research planning and design.</li> <li>2. A comprehensive knowledge and understanding of the practical aspects of performing, analyzing and interpreting a research project.</li> <li>3. A comprehensive knowledge and understanding of scientific reporting.</li> <li>4. The ability to plan and design a research project and do research seminars.</li> </ol>		
<b>Assessment</b>	40% Continuous Assessment Mark (16% Interim test; 10% seminar presentation, 16% proposal write-up) 60% Formal summative assessment (50% Written Project Report & 10% Project Results Seminar)		
<b>DP Requirement</b>	40% Continuous Assessment Mark 80% Attendance at practical's and fieldwork		

## Science Development Programme (The University of Zululand Science Centre)

Director	D Fish, BSc (Physics) (UCT), BScHons (Physics) (UCT), HDE (UCT), PhD (Physics) (UKZN), PrPhys
Operations Manager	C Thethwayo, MSc (Physics) (Unizulu)
Secretary	S Mthembu
Projects Officer	N Malinga, BSc Hons (Unizulu) HIV AIDS Manager
IKS Manager	D Thambaran, BSc (Enviro) (UKZN), PGDip (Education) (UNISA) M Nxumalo, PDRT (Hons) (UNIZULU), Cert (SciCom) (Stellenbosch), PGDip (Education) (UNISA), BA (Tourism) (UNIZULU), Cert (Project Management) (Exec. Education)
Exhibit Facilitator 1	R Nzimakwe
Exhibit Facilitator 2	S Mthiyane

**FOR FURTHER INFORMATION FOR ADMISSION, CONTACT:**

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