

CALENDAR 2013

FACULTY OF AGRICULTURE,
SCIENCE AND TECHNOLOGY
UNDERGRADUATE

Mafikeng Campus

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PLEASE MENTION YOUR UNIVERSITY NUMBER IN ALL CORRESPONDENCE.

The General Academic Rules of the University, to which all students have to subject themselves and which apply to all the qualifications offered by the University, appear in a separate publication and are available on the web page at:

http://www.puk.ac.za/calendar/index_e.html.

Please note: Although the information in this Calendar has been compiled with the utmost care and accuracy, the Council and the Senate of the University accept no responsibility whatsoever for errors that may occur. Before students finally decide on the selection of modules, they must consult the class timetable. If a clash occurs in the planned selection of a student, the relevant module combination is not permitted.

This calendar is applicable to students registered for the first time at the university in 2012. Students registered prior to 2012 should refer to the respective calendars applicable in their years for registration

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FACULTY OF AGRICULTURE, SCIENCE AND TECHNOLOGY (FAST)

Message from the Executive Dean

A warm welcome to our Faculty of Agriculture, Science & Technology (FAST). In FAST we are committed to serve our communities through training and development of competent scientists who will be able to address the ever changing and challenging needs of our country South Africa and Internationally.

This booklet/calendar is prepared to give a summary of programmes offered in our faculty. It is important to acquaint yourselves with the contents of this calendar to ensure that you know what FAST is all about.

FAST is made up of three schools namely;

- ❖ School of Agricultural Sciences,
- ❖ School of Environmental and Health Sciences and
- ❖ School of Mathematical and Physical Sciences

FAST hosts three centres namely;

- ❖ Centre for Animal Health Studies,
- ❖ Centre for Air and Water Research and
- ❖ Centre for Applied Radiation Science and Technology (CARST).

We want to urge you to commit yourself and we will endeavor to provide you with the necessary support to ensure that you achieve your goals within record time. We have staff members who are committed to serve you even on a one to one basis if you make an appointment. It is important to familiarize yourself with the contents of this document for you to be part of FAST.

VISION

The faculty strives for excellence in teaching, research, customer care and , community outreach.

VALUES

The faculty of Agriculture Science And Technology strives to deliver its mandate with integrity (Individually and collectively) , commitment, accountability and respect..

MISSION STATEMENT

The mission of the faculty is to realise the vision by:

1. educating and training scientists through quality teaching process to meet national needs.
2. developing professional offerings in Science; Engineering and Technology (SET).
3. providing programmes that are accessible to students in the country including the Historically Disadvantaged Individuals (HDIs).
4. conducting relevant research for the benefit of the province, the country and its people.
5. ensuring implementation of expertise (both profit and non profit) in the province and the country.
6. aspiring to be the centre of excellence in Radiation Science and Technology, Health and Environmental Science in order to be nationally and internationally recognised.
7. being sensitive to (and promoting public awareness of) the environment and the social needs of the province and the country.
8. recruiting; developing and retaining scholars (who are competent) in addressing all the above mentioned

AIMS AND OBJECTIVES

To provide formal quality education in Agriculture, Science and Technology in order to prepare students for careers in these fields.

To provide students with the opportunity for personal development to enable them to achieve their potential and to relate to other people engaged in the broad field of Science.

To plan, design, implement and evaluate education and training programmes that will provide appropriate numbers of suitably trained students required for the different phases of regional and national development.

To promote and to develop basic and applied research in the various science disciplines of the faculty and to establish national and international linkages.

To carry out research applied to regional problems by training postgraduates using activities designed to address actual problems and shortcomings.

To develop appropriate technology and to promote the transfer of this technology through innovative projects.

To review critically, from time to time, the role of the faculty and to collaborate with agencies which employ graduates of the faculty in order to develop suitable training programmes.

OFFICE BEARERS

EXECUTIVE DEAN

M.Davhana-Maselesele (Professor), RN, RM, BA Cur, BA Cur Hons, Nursing Education, Nursing Administration (UNISA), HRM, PHC (RAU), MA Cur (UNISA), PhD (RAU).IRENSA (UCT) Post Doctoral Studies (UCLA- Los Angeles)

Faculty Manager

H. P. Kgoa, Dip Agric (Unibo), BPA (Unibo), B Admin Hons (Unisa), MBA (UNW)

DIRECTORS OF SCHOOLS / RESEARCH UNITS

Agricultural Sciences (SoAS)

O.I Oladele, BSc Agricultural Extension, MSc, PhD(University of Ibadan, Nigeria)

Mathematical and Physical Sciences (SoMPS)

E.E. Ebenso, BSc (Hons)(Calabar), MSc (Ibadan), PhD (Calabar)

Environmental and Health Sciences (SoEHS)

Dr T. Sithebe MSc (University Of Southern Illinois, PhD Virology (Medunsa)

CENTRE MANAGERS

Applied Radiation Science And Technology

M. T. Kambule (Associate Professor), BSc (Unisa), BSc Hons (Unin), MSc (Unisa), PhD (Massachusetts)

RESEARCH NICHE AREA

Professor

S. A. Materechera, BSc Agric (Malawi), MSc Soil Sci (McGill), PhD (Adelaide)

SUBJECT GROUP CHAIRPERSONS

Agricultural Economics & Extension

*L. K. Mabe, B Agric (Unibo), P.G.D Ed, P.G.D Agric Ext, BSc Agric Hons (UNW) MSc , PhD (NWU)

Animal Health

Senior Lecturer

*Dr. Nyirenda BVM (University of Zambia) MSc James Cook University, Australia

Animal Science

* S. D. Mulugeta, BSc (AAU), MSc (AUA), PhD (UFS)

Biological Sciences

* O. Ruzvidzo. BSc Hons (National University of Science and Technology, Zimbabwe), MSc (University of Zimbabwe), PhD (University of the Western Cape)

Chemistry

*D. A. Isabirye, BSc Hons (Makerere), PhD (Hong Kong)

Computer Science

*O. Ekabua BSc (Uninyo), MSc (ATBU) PhD (University of Zululand)

Crop Science

*M. S. Mokolobate (Lecturer) BSc Agric (Fort Hare), Cert Soil Analysis (Fort Hare), Dip Plant Production (Unibo) MSc Agric (Natal).

Geography And Environmental Sciences

* Kabanda BSc Hons (UK) MSc (UCT) PhD (Univen)

Mathematical Sciences

*C.M. Khalique (Professor), MSc, M Phil (Quaid-i-Azam) MSc, PhD (Dundee) C. Math. FIMA

Nursing Science

*D.R. Phetlhu, Diploma in (General Psychiatric, Community) Nursing and Midwifery (Western Transvaal Nursing College) Diploma In Advanced Nursing Science (RAU) BA Nursing, Nursing Education and Administration (PU for CHE) M CUR (NWU) PhD (NWU)

Physics

* K. Dzinavatonga, BSc Hons, MSc (University of Zimbabwe)

RESEARCH PROFESSORS

Professor

S. A. Materchera, BSc Agric (Malawi), MSc Soil Sci (McGill), PhD (Adelaide)

Professor

J. Moori, BSc Hons (Iran) MSc, PhD (Birmingham, UK) Fellow of UKZN (in Mathematics)

Professor

M. Selvaratnum, BSc (Ceylon), PhD DIC (London), FI Chem (Ceylon), FRSC (London) CChem

Associate Professor

U. Useh BSc. Hons Physiotherapy. M.Ed Exercise Physiogy (University Of Ibadan), PhD in Sociology (UNIVEN) PGD in Education (University Of Plymouth) Fellow Higher Education Academy (UK).

Associate Professor

TR. Medupe, MSc Astrophysics UCT (PhD) UCT

Farm Administration

B. D. Gaobepe (Farm Manager), B Agric (Fort Hare), B. Agrar Ins Hons, Agric Econs

Secretaries:

K.A. Kgaboesele

R.M. Maepa

M.K. Medupe

M.G. Mokoko

M.K. Mosala

J.B. Ndlangisa

L.M. Segoje

S.M. Sepeng

Assistant Admin. Officers:

B.Tau

S. Thaga
T. Masalesa
T. Oliphant

Messengers:

J.K. Beleng
S. T. Moses

TECHNICIANS

Animal Health

L.E. Motsei (Principal Technician), BSc Agric, BSc Agric (Hons), MSc Agric (UNW)
J. K. Lesetedi (Senior Technician), Dip Animal Health (Taung College of Agric), BSc Agric (Animal Health), BSc Agric (Hons) (AH) (UNW)
G. M. Raito (Senior Technician), Dip in Animal Health (Taung College of Agric), BSc Agric (Animal Health), BSc Agric (Hons) (AH) (UNW)
N.D. Lesaoana (Senior Technician), BSc Agric (Animal Health), BSc Agric (Hons) (AH) (UNW)
T.P. Ateba (Technician), BSc Agric (Animal Health), BSc Agric (Hons) (A/H), MSc Agric (NWU)
T. K. Moroane (Technician) BSc Agric (Animal Health), BSc Agric (Hons) (A/H) (NWU)
O.M. Tekolo (Laboratory Technician) Bsc Agric (Animal Health), Bsc Agric (Hons) (A/H) (NWU), Msc (Microbiology) (Stellenbosch)
K.A. Maropefela (Technician) BSc Agric (Animal Health), BSc Agric (Hons) (A/H) (NWU)
V.E. Mjekula (Technician) BSc Agric (Animal Health), BSc Agric (Hons) (A/H) (NWU)
N.S. Dube (Hospital Receptionist)
G. Kwamongwe (Clinic Attendant - Small Animals)
J. Mogotsi (Lab Attendant)
T.P. Mhlongo (Clinic Attendant – Large Animals)
O. Mocumi (General Attendant)

Animal Science

S.C. Gajana (Technicia), BSc. Agric (Animal Science), MSc. Agric (Animal Science) (UFH)
G. Matlabe (Technician). BSc. Agric (Animal Science) (NWU)
M. Mpayipheli (Technicia), BSc. Agric (Animal Science) (UFH) MSc. Agric (Animal Science) (IOWA STATE UNIVERSITY)
S. MMutloane
P. Motlhabane (Dairy Foreman) - BSc. Agric (Animal Science) (NWU)

Biological Sciences

M.H. Huyser (Senior Technician), National Diploma Biomed. Tech. (TUT), PGCE (UNISA), BSc Hons (UNISA)
T.J. Mabunda (Technician), BSc Genet & Dev Bio (WITS), BSc Hons Med Virol (MEDUNSA)
J Morapedi

Chemistry

C.L Murulana, BSc (Chem) UNIVEN, BSc Hons (NWU)
N. Gumbi B. Tech (Chem) Durban University Of Technology

Crop Science

Huse (Senior Technician), BSc (Agric) (Pasture Science) (Natal)
K. S. Gareseitse (Technician) Dip Electronics (TSA)
R.M. Mashile, BSc Agric (Crop Science) (UNW), BSc Hons. Crop Science (NWU) (Technician)

Geography and Environmental Sciences

L Makhoba BSc (Vista University)
D.J.D.N. Wijesiri

Physics

M. M. Molefe, Analytical Quality Management, Laboratory Management (Technikon Pretoria).
S. Thamaga, BSc (UNW), BSc Hons (NWU)

Farm

B. S. Mmutloane, Dip Animal Health (Taung College)
K. P. Motthabane, Dip Agric (Unibo), BSc Agric (UNW)

FACULTY COUNCIL – ACADEMIC BOARD

AGRICULTURAL ECONOMICS AND EXTENSION

Professor

O.I Oladele, BSc Agricultural Extension, MSc, PhD (University of Ibadan, Nigeria)

Associate Professor

A S Oyekale, BSc. (Agricultural Economics), MSc, PhD (University of Ibadan, Nigeria)

Senior Lecturer

M.A. Antwi, BSc Hons Agric Econs (U.S.T., Kumasi), MSc (UP), MBA (PU for CHE), PhD (NWU)

Lecturer

*L.K. Mabe, B Agric (Unibo), P.GD Ed, P.GD Agric Ext, BSc Agric Hons (UNW) MSc , PhD (NWU)

Lecturer

S.S. Tekana, B Agric Ed (Unibo), P.GD Agric Econs, BSc Agric Hons (UNW), Msc Agric Econs (NWU)

ANIMAL HEALTH

Associate Professor

F.R. Bakunzi, BVM (Makerere), MSc (Guelph), PhD (Medunsa)

Associate Professor

B.M. Dzoma, BVSc (University of Zimbabwe), MSc, Certificate: Laboratory Animal Science (Utrecht University, Netherlands)

Associate Professor

M.S. Syakalima, B.Vet. Med (University of Zambia), MSc (University of Edinburgh. CTVM. Scotland), PhD (Hoddrido University, Japan)

Senior Lecturer

R.V. Ndou, BVMCh (Medunsa)

Senior Lecturer

R.S. Verster, BVSc, BVSc (Hons), MSc (UP)

Senior Lecturer

*M. Nyirenda BVM (University of Zambia) MSc James Cook University, Australia

Senior Lecturer

M. Mefane, BVSc (UP)

Senior Lecturer

L.K. Taoana, BVSc (UP)

Senior Lecturer

M. Mwanza, MSc ,(UJ) PhD (UJ)

Lecturer

G.B. Kgobe, Bsc Agric (Animal Health) Bsc Agric (Hons) (A/H), MSc Agric, PhD Agric (NWU)

ANIMAL SCIENCE**Senior Lecturer**

*S. D. Mulugeta, BSc (AAU), MSc (AUA), PhD (UFS)

Associate Professor

V. Mlambo, MSc Agric (UZ), PhD (Reading)

Senior Lecturer

K.H. Mokoboki, BSc. Agric (UL), MSc (UL), PhD (UL)

Senior Lecturer

C. K. Lebopa, BSc Agric, BSc Agric Hons, MSc (Fort Hare) PhD (Pretoria)

Senior Lecturer

U. Marume MSc Agric (UZ), PhD (UFH)

Lecturer

B. A. Pico, BSc Agric Hons (UFS), MSc (UFS)

Lecturer

N.A. Sebola, BSc. Agric (UL), MSc (UL)

BIOLOGICAL SCIENCES**Associate Professor**

P. W. Malan, BSc Ed, MSc, PhD (UFS).

Senior Lecturer

* O. Ruzvidzo. BSc Hons (National University of Science and Technology, Zimbabwe), MSc (University of Zimbabwe), PhD (UWC)

Senior Lecturer

T Sithebe MSc (University Of Southern Illinois), PhD Virology (Medunsa)

Senior Lecturer

O.O. Babalola, BSc Hons (Ogun) MSc, PhD (University of Ibadan)

Senior Lecturer

R. E. Gopane, BSc (Unin) BSc Hons (PU for CHE), MSc (Unibo), PhD (NWU).

Lecturer

T. D. Kawadza, BSc (NUL), MSc (PU for CHE).

Lecturer

C.N. Ateba Bsc (Univ. Of Buea), Hons (NWU), MSc (NWU), PhD (NWU)

Lecturer

N. J Tsita, BSc (Univen), BSc (Hons), MSc (Rhodes)

CENTRE FOR APPLIED RADIATION SCIENCE AND TECHNOLOGY**Manager**

M. T. Kambule (Associate Professor), BSc (Unisa), BSc Hons (Unin), MSc (Unisa), PhD (Massachusetts)

Associate Professor

V. Tshivhase, BSc Hons Physics(UCT), MSc Physics (UCT), PhD Physics(UCT)

Senior Lecturer

N. K. Mumba, BSc (Zambia), MSc (Windour), PhD (Kossuth)

CHEMISTRY**Professor**

E.E. Ebenso BSc (Hons)(Calabar), MSc (Ibadan), PhD (Calabar)

Associate Professor

*D. A. Isabirye, BSc Hons (Makerere), PhD (Hong Kong)

Associate Professor

H. P. Drummond, BSc Hons (UCT) HED (SA) MEd (Wits), PhD (UNW)

Senior Lecturer

S. Phirwa, BSc (UBLS) MSc (SUNY-Fredonia) PhD (SUNY-Stony Brook)

Senior Lecturer

M. Hlophe, BSc (Botswana-Swaziland) MSc (Bristol) PhD (NWU)

Senior Lecturer

L.M. Katata, BSc, BSc Hons(UWC) MSc, PhD Stelenbosch University

Lecturer

Dr M.J. Klink MSc, PhD (UWC)

Lecturer

Z. Mkhize BSc Hons, MSc (KZN)

Lecturer

N. H. Seheri, BSc Ed (UNW), BSc Hons (UNW), MSc (NWU)

CROP SCIENCE**Professor**

C. Chiduzu, BSc Agric (Crop Science) MPhil, PhD (University of Zimbabwe)

Professor

W.D. Gestring, BSc in Soil Science, MSc in Soil Science, (University of California at Riverside), PhD in Agronomy (Colorado State University)

Associate Professor

V.M. Ngole PhD; MSc Env Science (Univ. Botswana) BSc Zoology Ahmadubello Univ Zaria (Nigeria)

Senior Lecturer

K Ramachela B. Sc Agriculture (UNiversity of Guyana), M. Sc Plant Pathology (University College of Wales), PhD Forestry & natural Resources Science (Stellenosch)

Lecturer

*M. S. Mokolobate, BSc Agric (Fort Hare), Cert Soil Analysis (Fort Hare), Dip Plant Production (Unibo) MSc Agric (Natal)

COMPUTER SCIENCE**Associate Professor**

*O. Ekabua BSc (Uninyo), MSc (ATBU) PhD (University of Zululand)

Senior Lecturer

Z. P. Ncube BSc Hons (Enrique Jose Varona) MSc

GEOGRAPHY AND ENVIRONMENTAL SCIENCES**Associate Professor**

*T Kabanda BSc Hons (UK) MSc (UCT) PhD (Univen)

Associate Professor

C. Munyati ,BSc (Zambia), MSc, PhD (Stirling)

Associate Professor

TM Ruhiga, BA,UED (Makerere) Dip BF, DipAcc (ICS-London), BA Hons (Unisa), MSc (Fort Hare), PhD (UNIN),Cert.AHE (UFS)

Senior Lecturer

J. H. Drummond, BA (Soc Sci), BA Hons (Glasgow), MA (Wits).

Senior Lecturer

Dr L. G. Palamuleni MSc (University Of Malawi) PhD (UJ)

Lecturer

Dr. M. Manjoro

MATHEMATICAL SCIENCES**Professor**

*C.M. Khaliq, MSc, M Phil (Islamabad) MSc, PhD (Dundee) C. Math. FIMA

Lecturer

T.T. Seretlo, BSc, BSc Hons, MSc (Fort Hare)

Lecturer

Mr I Mhlanga MSc (Bindura University)

Lecturer

D M Mothibi Msc (University Of Stellenbosch)

Lecturer

B Muatjetjeja BSc, BSc (Hons), MSc, PhD (NWU)

NURSING SCIENCE

Senior Lecturer

*Dr R Phetlhu Diploma in (General Psychiatric, Community) Nursing and Midwifery (Western Transvaal Nursing College) Diploma In Advanced Nursing Science (RAU) BA Nursing, Nursing Education and administration (PU for CHE) M CUR (NWU) PhD (NWU)

Senior Lecturer

E. M. Manyedi, Diploma in Psychiatry (Bophelong Hospital) Diploma in Midwifery,) Diploma in General Nursing (Baragwanath Hospital) (CMR), B.A. Cur, Diploma in Research Methodology (UNISA), M. Cur (PUCHE), PhD (NWU).

Lecturer

T. E. Maseng, Diploma in Midwifery (Benediction Hospital), Diploma in Psychiatry (Bophelong Hospital), General Nursing (St. Courads), BN, BNSc Hons (UNIBO), MPH (MEDUNSA).

Lecturer

M. M. Chulu, Diploma in Midwifery, Diploma in General Nursing (Frere Hospital), Diploma in Psychiatry (Bophelong Hospital), B.A. Cur (UNISA) Diploma in Research Methodology (RAU)

Lecturer

K. K. Direko, Diploma in Intensive Care, Diploma in Midwifery (Baragwanath Hospital), Diploma in General Nursing (H.F. Verwoerd Hospital), B.A. Cur (UNISA), Advanced Diploma in Adult Education (Wits), M.Ed (Wits).

Lecturer

G. M. Masilo, Diploma in General Nursing Science (Glen Grey Hospital), Diploma in Midwifery (Tshepong Hospital), Diploma in Paediatric Nursing Science (Baragwanath Hospital), Diploma in Research Methodology (RAU), B.A. Cur (UNISA), BNSc Hons (UNW), M.A. LFC (Life Skills and Counselling).

Lecturer

M. A. Rakhudu, Diploma in Midwifery, Diploma in General Nursing (Natalspruit Hospital), Diploma in Human Resource Management (UNW), B.A. Cur, B.A. Cur Hons, (UNISA), M.Cur (PU).

Lecturer

M.J. Matsipane, Diploma in Midwifery, Diploma in General Nursing (Bophelong Nursing School), B.A. Cur, B.A. Cur Hons (UNISA), M. Cur (RAU).

Lecturer

S.M. Mokone, Diploma in General Nursing (Bophelong General Hospital), Diploma in Midwifery (George Stegman Hospital), BA Cur, BA Cur Hons (UNIBO), MSc Population studies (UNW).

Lecturer

P.M. Sithole Diploma in General Nursing (Ga-rankuwa Nursing College) Diploma in Midwifery (Elim hospital) Diploma In advanced Midwifery (Baragwanath Nursing College) Diploma in human Resource, Management (Allenby College), Diploma in Nursing Administration (UNISA) BA Cur (UNISA) BA Cur Hons (University Of Venda)

Lecturer

L.A. Sehularo BNSc (NWU) Mcur (Psychiatric Nursing) PUKE

Lecturer

Z. Manyisa Bcur, MPH (Medunsa)

Lecturer

L. Makhado BcurNS (UNIVEN) Mcur (Community Nursing Sc) (NWU)

Lecturer

N.P. Mmushi Bcur (UP) Mcur (NWU)

Resource Center Manager

P.T. Motsilanyane, RN, RM (MACON), Dip Community Nursing Science (RAU), Dip in Nursing Administration and Nursing Education (UP), Dip in Trauma and Emergency nursing Science (Chris Hani Baragwanath nursing College), B Tech Occupational Health (TUT)

PHYSICS**Professor**

S. H. Taole, BSc, MSc (Wales), PhD (Ottawa)

Associate Professor

T.R. Medupe, MSc Astrophysics UCT (PhD) UCT

Senior Lecturer

S. Makgamathe, BSc (Unin), BSc Hons (Unisa), MSc (PU for CHE)

Senior Lecturer

A. Mawire, BSc Hons (NUST, Zimbabwe), MSc (UKZN), PhD (NWU)

Senior Lecturer

T Tshepe, BSc (UNISA), MSc, Ph.D (Wits), MSc (Eng. Management) UP, Cert. Risk Management (UNISA)

Lecturer

K. Dzinavatonga, BSc Hons, MSc (University of Zimbabwe)

Lecturer

S. Rwabona-Katashaya, BSc (Makerere) MSc (Dares Salaam), PhD (Essex)

M.A.1 FACULTY RULES

MA.1.1 AUTHORITY OF THE GENERAL RULES

The faculty rules valid for the different qualifications, programmes and curricula of this faculty and contained in this faculty calendar are subject to the General Rules of the University, as determined from time to time by the Council of the University on recommendation by the Senate. The faculty rules should therefore be read in conjunction with the General Rules.

MA.1.2 FACULTY-SPECIFIC RULES

1.1.General

- 1.1 The rules of the Faculty must be read in conjunction with the general rules of the University.
- 1.2 A student wishing to enrol for any module offered in the Faculty must meet all the requirements stipulated for that module.

2. Admission Requirements

To be admitted to a degree or a diploma programme in the Faculty an applicant must satisfy the requirements of general rule 1.2 and any additional requirements stipulated for that programme.

2.1 Degrees

The University uses the **M-Score (Matric score)** rating system which awards points to 4 relevant matric subjects passed according to the scale below.

	A	B	C	D	E	F
HG	6	5	4	3	2	1
SG	5	4	3	2	1	0

Please note that the minimum rating points depend on the programme. The Mathematics requirement is a D at SG or an E at HG.

APS level system is as follows

Level	1	2	3	4	5	6	7
Percentage	0-29	30-39	40-49	50-59	60-69	70-79	80-100
Score	1	2	3	4	5	6	7

The University also uses the (Academic Point Score) **APS-Score** rating system which awards points to 6 relevant National Senior Certificate (NSC) subjects.

THE M-SCORE AND APS SYSTEMS

APS	Marks	M SCORE	MATRIC	
NSC-level			HIGHER GRADE	STANDARD GRADE
7	80-100%	6	A	
6	70-79%	5	B	A
5	60-69%	4	C	B
4	50-59%	3	D	C
3	40-49%	2	E	D
2	30-39%	1	F	E
1	0-29%	0	G	F

Degree	NSC Subjects	APS Score
BSc 3 years Mathematics, Applied Mathematics, Chemistry, Statistics Biology, Geography, Computer Science	Mathematics Level 4 and Physical Science Level 4	20
	Mathematics Level 3 and Physical Science Level 4	20
BSc Agric 4 years	English level 4 Mathematics Level 4, Physical Science Level 4	20
BNSc 4 years	Mathematics Literacy 5 , Pure Mathematics level 4, physical Science level 4 or Life Science Level 4	24
BSc Land Management 3 years	Mathematics Level 3 and Life Science Level 4.	

2.2 BSc-e Degree

Students who have not achieved the required points for entry into BSc may be admitted into the BSc Extended (BSc-e) Programme.

BSc-e	NSC Subjects	APS Score
Extended Bachelor of Science (4 years)	English level 3 Mathematics Science subject level 3	20

2.3 Diplomas

Students who have not achieved the required points for entry into BSc Agric may be admitted into any of the three Agriculture Diploma Programmes.

The requirement is an M-Score of 6 plus evidence of an attempt in Mathematics **OR** an APS-Score of 15 with Mathematics Level 2 or Mathematics Literacy Level 3 and Science Level 2.

Diploma	NSC Subjects	APS Score
Diploma in Animal Health N101M (3 years)	English level 3 Mathematics level 3 and Physical Science	15
Diploma in Animal Science N101M (3 years)	English Level 3 Mathematics Level 2 Science Subject	15
Diploma in Plant Sciences (3 years)	English level 3 Mathematics level 3 Physical Science level 3	15

3 Farm Practical

- 3.1 A student studying agriculture shall be required to gain farm practical experience of a minimum duration, as prescribed for a particular study programme, at an approved institution under the guidance of an approved supervisor. A mark shall be awarded for each completed period of farm practical experience.
- 3.2 A student studying agriculture shall be required to carry out practical Farm/Laboratory work at various times during semesters.

4 Examination

- 4.1 In terms of rule 2.4 proof of participation in a module is required for admission to any end-of-module examination. Such proof will only be issued to a student who has complied with the specific requirements of the module as set out in the relevant study guide, and has, where applicable, completed the practical work and experiential learning hours required for that module.

- 4.2 The examination methods may include class tests, assignments, practical work etc. The participation mark is the weighted mean of all marks earned in these assessments.
- 4.3 No candidate shall be admitted to an end of module assessment (Exam) unless the relevant participation requirements have been met, and a sub-minimum mark of at least 40% has been obtained.
- 4.4 The final mark in a module will be made up by combining, with equal weighting, the participation mark and the end-of-module examination mark.
- 4.5 A sub-minimum mark of 40% must be obtained in the main examination in order for a module to be completed. A sub-minimum is the lowest mark acceptable as proof that participation has occurred.

5 Pass Requirements

The terms and condition of passing modules and curricula are set out in general rule 2.4.3. A student will be deemed to have completed a programme only when all the modules prescribed have been passed and in accordance with the requirements sets within the school and department concerned.

Rule 2.4.3.2 and 2.4.3.4 will not be applicable to FAST so as to meet the requirements of the professional bodies. Professional bodies (South African Veterinary Council (SAVC) and South African Nursing Council SANC) requires that students pass, both theory and practical exams, with a minimum of 50% for them to be automatically registered.

6 Number of Examination Opportunities

The number of examination opportunities is governed by general rule 2.4.4. An implication of this rule is that a student who fails a module will not be exempted from classes in that module.

7 Readmission to a Programme

- 7.1 In compliance with general rule 1.4 a student who, at the end of one year of study in a degree or diploma programme, has obtained less than half the credits of level 1 of the curriculum will have to apply for re-admission.
- 7.2 A student who at the end of two years of study in a degree or diploma programme will not have obtained half the credits prescribed for the first two years of study in that programme will have to apply for re-admission. If the re-admission is successful the student will not be permitted to take any modules from level three but will only be permitted to register for outstanding modules in levels 1 and 2.
- 7.3 The principle on module load as in 2.3.4 above shall apply.

8 Exemption from Modules completed towards another Diploma or Degree

A candidate may apply for exemption from a module if credit has been obtained for the same or an equivalent module toward another diploma or degree of either this

University or another recognized University in line with rule 2.3.2 A candidate shall not be granted exemption from more than half of the total number of modules required for the curriculum.

9 **Registration for additional modules**

Candidate may be allowed to register for additional modules subject to the provisions of general rule 2.3.4 The Faculty reserves the right to refuse registration in cases that may lead to clashes.

MA.1.3 WARNING AGAINST PLAGIARISM

Assignments are individual tasks and not group activities (unless explicitly indicated as group activities). For further details see:

<http://www@nwu.ac.za>

MA.1.4 CAPACITY STIPULATION

Please take cognizance of the fact that, owing to specific capacity constraints, the University reserves the right to select candidates for admission to certain fields of study. This means that prospective students who comply with the minimum requirements may not necessarily be admitted to the relevant courses.

MA.1.5 SCHOOLS OF THE FACULTY

School	Subject group
Agricultural Sciences (SoAS)	Agricultural Economics and Extension Animal Science Plant Sciences Centre for Animal Health Studies (CAHS)
Environmental and Health Sciences (SoEHS)	Biological Sciences Biochemistry Geography and Environmental Sciences Microbiology Nursing Sciences Centre for Air and Water Research (CAWR)
Mathematical and Physical Sciences (SoMPS)	Chemistry Mathematical Sciences Physics and Electronics Computer Science
Centre for Applied Radiation Science and Technology (CARST)	

MA.1.6 QUALIFICATIONS, PROGRAMMES AND CURRICULA

DIPLOMAS				
Qualification	Programme and code	Curriculum and code	Method of delivery	NQF level
University Diploma in Animal Health	Animal Health -- 266 100	Curriculum N102M	Full-time	7
Diploma In Agric In Animal Science	Animal Science – 279 100	N101M	Full-time	7
Diploma In Agric In Plant Sciences	Plant Sciences – 279 101	N101M	Full-time	7
FIRST BACHELOR DEGREES				
Qualification	Programme and code	Curriculum and code	Method of delivery	NQF level
Bachelor Of Science (BSc) Agriculture	Agric Economics – 267 100	Agric Economics - N 401M	Full-time	8
Bachelor Of Science (BSc) Agriculture	Animal Health – 267 -101	Animal Health N401M	Full-time	8
Bachelor Of Science (BSc) Agriculture	Animal Science - 267 102	Animal Science - N401M	Full-time	8
Bachelor Of Science (BSc) Agriculture	Plant Sciences – 267 - 103	Plant Sciences – N401M	Full-time	8
Bachelor Of Science	Land Management - 268 100	Land Management - N108M	Full-time	7
Bachelor Of Nursing (BN)	BN IN Education 269 101	Nursing Education N110M	Full-time	7
Bachelor Of Nursing (BN)	Bn In Management 269- 100	Nursing Management N109m	Full-time	7
Bachelor Of Nursing Science (BNSc)	Bachelor Of Nursing Science – 270 102	Nursing Science N111M	Full-time	8
Bachelor Of Science (BSc)	BSc – Extended 200 158	Applied Mathematics Mathematic N 301M	Full-time	7
Bachelor Of Science (BSc)	BSc - Extended 200 157	Applied Mathematics & Computer Science N 301M	Full-time	7
Bachelor Of Science (BSc)	BSc - Extended 200 159	Biology – Chemistry N 301M	Full-time	7
Bachelor Of Science (BSc)	BSc – Extended 200 160	Chemistry - Physics N 301M	Full-time	7
Bachelor Of Science (BSc)	BSc - Extended 200 161	Computer Science - Electronics N 301M	Full-time	7
Bachelor Of Science (BSc)	BSc – Extended 200 162	Computer Science - Mathematics N 301M	Full-time	7

Bachelor Of Science (BSc)	BSc in Mathematics – Statistics 200 165 Extended	Mathematics – Statistics N301M	Full-time	7
Bachelor Of Science (BSc)	BSc in Mathematics - Electronics 200 163 Extended	BSc Mathematics - Electronics N301M	Full-time	7
Bachelor Of Science (BSc)	BSc in Mathematics – Physics 200 164 Extended	Mathematics – Physics N301M	Full-time	7
Bachelor Of Science (BSc)	BSc in Applied Mathematics - Chemistry - 200 169	Applied Mathematics – Chemistry N 112M	Full-time	7
Bachelor Of Science (BSc)	BSc in Applied Mathematics – Electronics 200 171	Applied Mathematics – Electronics N114M	Full-time	7
Bachelor Of Science (BSc)	BSc in Applied Mathematics – Mathematics 200 172	Applied Mathematics- Mathematics N115M	Full-time	7
Bachelor Of Science (BSc)	BSc in Applied Mathematics – Physics 200 152	Applied Mathematics – Physics N116M	Full-time	7
Bachelor of Science (Bsc)	BSc in Biology – Chemistry 200 173	Biology – Chemistry N 117M	Full-time	7
Bachelor of Science (Bsc)	BSc in Biochemistry - Chemistry 200 190	Biochemistry - Chemistry N174M	Full-time	7
Bachelor of Science (Bsc)	BSc in Microbiology - Biochemistry 200 118	Microbiology – Biochemistry N167M	Full-time	7
Bachelor of Science (Bsc)	BSc in Microbiology- Chemistry 200 118	Microbiology- Chemistry N168M	Full-time	7
Bachelor of Science (Bsc)	BSc in Biology – Geography) 200 174	Biology – Geography) N118M	Full-time	7
Bachelor Of Science (BSc)	BSc in Mathematics – Computer Science 200 137	BSc Mathematics – Computer Science N127M	Full-time	7
Bachelor Of Science (BSc)	BSc in Mathematics – Electronics 200 179	BSc Mathematics - Electronics N129M	Full-time	7
Bachelor Of Science (BSc)	BSc in Chemistry- Physics 200 129	Chemistry –Physics N 124M	Full-time	7
Bachelor of science (BSc)	BSc in Computer Science – Geography 200 178	Computer Science – Geography N126M	Full-time	7
Bachelor of science (BSc)	BSc in Geography – Chemistry 200 150	Geography – Chemistry N122M	Full-time	7
Bachelor Of Science (BSc)	BSc in Mathematics – Chemistry 200 140	Mathematics - Chemistry N123M	Full-time	7
Bachelor Of Science (BSc)	BSc in Mathematics – Physics 200 134	Mathematics – Physics N131M	Full-time	7
Bachelor Of Scienc (BSc)	BSc in Mathematics – Statistics	Mathematics – Statistics N132M	Full-time	7

	200 138			
Bachelor Of Science (BSc)	BSc in Electronics-Physics 200 180	Electronics – Physics N 130M	Full-time	7
Bachelor Of Science (BSc)	BSc in Computer Science - Chemistry - 200 130	Computer Science - Chemistry N 120M	Full-time	7
Bachelor Of Science (BSc)	BSc in Computer Science - Electronics - 200 177	Computer Science – Electronics N 125M	Full-time	7
Bachelor Of Science (BSc)	BSc in Computer Science – Physics 200 132	Computer Science – Physics N 128M	Full-time	7

MA.1.7 RULES FOR THE DIPLOMA AND DEGREE

MA.1.7.1 Duration (minimum and maximum duration)

Minimum and Maximum Duration

The minimum duration of the studies for the undergraduate diplomas is three years and the maximum duration is four years of full time study.

The minimum duration of the studies for the degree in Land Management is three years and the maximum duration is four years of full time study.

The minimum duration of the studies for the other first degree programmes in the school is four years and the maximum duration is five years of full time study.

MA .1.7.2 Admission

To be admitted to diploma study programmes, a student must satisfy the requirements of general rule 1.2

To be admitted to degree study programmes, a student must satisfy the Faculty Sepecific Requirements rule 2. A pass in mathematics, physical science and/or biology will be an advantage.

Students who hold a diploma in Animal Health may be admitted into the Animal Health degree programme and be exempted from courses in accordance with rule 2.3.2

MA. 1.7.3 MODULE LISTS

Diploma In Animal Health			
Module code	Descriptive name	Prerequisites	Credits
AHVM 111	Anatomy and Physiology : Animal Health 1	None	12
AHVM 122	Anatomy and Physiology : Animal Health 11	None	12
AHVM 112	Animal Handling and equipments I	None	8
AHVM 123	Animal Handling and equipments II	None	8
AHVM 121	Basic Microbiology for Animal Health	None	12
AHVM 211	Diseases I	AHVM 121	16
AHVM 221	Diseases II	AHVM 121	16
AHVM 212	Parasitology for Animal Health	None	8

AHVM 223	Pharmacology and Toxicology: Animal health	None	16
AHVM 222	Obstetrics and Genital Diseases:Animal Health	None	16
AHVM 224	Public Health for Animal Health	None	8
AHVM 225	Clinical Laboratory Techniques	AHVM 121	8
AHVM 311	Companion Animal Medicine and surgery I	AHVM 111, 122, 223	16
AHVM 321	Companion Animal Medicine and surgery II	AHVM 111, 122, 223	16
AHVM 312	Production Animal Medicine and surgery I	AHVM 111, 122, 223	16
AHVM 322	Production Animal Medicine and surgery II	AHVM 111, 122, 223	16
AHVM 313	Pathology I	AHVM 111	8
AHVM 323	Pathology II	AHVM 122	8
AHVM 314	Epidemiology and Jurisprudence	None	8
AHVM 315	Practical learning and Experiential Learning I	None	8
AHVM325	Practical learning and Experiential Learning II	None	8
AHVM 324	Scheduled Diseases	None	8
BSc Agric In Animal Health			
Module code	Descriptive name	Prerequisites	Credits
AHPM 211	Microbiology for Animal Health	None	16
AHPM 212	Anatomy and Physiology I for Animal health	None	16
AHPM 221	Anatomy and Physiology II for Animal Health	None	8
AHPM 222	Animal Handling and equipments I	None	8
AHPM 314	Animal Handling and equipments II	None	8
AHPM 311	Diseases I	AHPM 211	16
AHPM 321	Diseases II	AHPM 211	16
AHPM 322	Parasitology: Animal Health	None	16
AHPM 323	Pharmacology and Toxicology: Animal Health	None	16
AHPM 313	Obstetrics and Genital Diseases: Animal Health	None	16
AHPM 324	Veterinary Animal Health 1	None	8
AHPM 325	Clinical Laboratory Techniques	AHPM 211	8
AHPM 312	Epidemiology and Jurisprudence	None	8
AHPM 411	Companion Animal Medicine and surgery I	AHPM 212, 221, 323	16
AHPM 421	Companion Animal Medicine and surgery II	AHPM 212, 221, 323	16
AHPM 412	Production Animal Medicine and surgery I	AHPM 212, 221, 323	16
AHPM 422	Production Animal Medicine and surgery II	AHPM 212, 221, 323	16
AHPM 413	Pathology I	AHPM 212	8
AHPM 423	Pathology II	AHPM 221	8
AHPM 414	Practical learning and Experiential Learning I	None	8
AHPM 424	Practical learning and Experiential Learning II	None	8
AHPM 426	Scheduled Diseases	None	8
AHPM 415	Research Project and Seminar	None	16
AHPM 425	Research Project and Seminar	AHPM 415	16

Bachelor of Science in Agriculture in Agricultural Economics			
Module code	Descriptive name	Prerequisites	Credits
AEDM 111	Introduction to Agricultural Economics	NONE	12
AXDM 211	Fundamentals of Agricultural Extension	NONE	16
AEDM314	Farm Management and Accounting	AEDM 111	8
AECM111	Introduction to Agricultural Economics	NONE	12
AEXM211	Fundamentals of Agricultural Extension	NONE	16
AEXM212	Communication and Agricultural Technology Transfer	AEXM 211	8
AECM213	Food Security Analysis	AECM 111	8
WVNS211	Understanding the world of Natural Sciences	NONE	12
WVAS221	Understanding the world of Agriculture	NONE	12
AECM221	Land Reform and Agricultural Development	NONE	8
AEXM222	Agricultural Extension for Development	NONE	8
AECM223	Farm Accounting	NONE	8
AECM311	Agricultural Micro-Economics	AECM 111	16
AECM312	International Agricultural Trade	AECM 111	8
AECM313	Agricultural Statistics for Research I	ANSM 121	16
AECM314	Farm Management and Accounting	AECM 111	8
AECM321	Land Resource and Environmental Economics	AECM 111	16
AECM322	Agricultural Production Economics	AECM 111 AND AECM 311	16
AECM323	Agricultural Marketing	AECM 314	8
AEXM324	Agricultural Rural Sociology	AEXM 211 AND AEXM 222	8
AECM325	Agricultural Macro-Economics	AECM 111 AND AECM 311	8
AECM411	Agricultural Project Appraisal and Management	AECM 314	8
AECM412	Research Project and Seminar I		8
AECM413	Quantitative Methods in Agricultural Economics	AECM 311 AND AECM 325	8
AECM414	Agricultural Statistics for Research II	AECM 313	8
AECM415	Agribusiness Management	AECM 314	8
AECM421	Farm Planning and Linear Programming	AECM 314	8
AECM422	Agricultural Policy Analysis	NONE	8
AECM423	Agricultural Finance	AECM 314	8
AECM424	Agriculture and Economic Development	AECM 221 AND AECM 311	8
AECM425	Research Project and Seminar II		8
Diploma in Animal Science			
Module code	Descriptive name	Prerequisites	Credits
ANDM 121	Introduction to Animal Science	None	12
ANDM 122	Non – Ruminant Production	None	8
ANDM 211	Animal Nutrition	ANDM 121	16
ANDM 212	Animal Genetics and Breeding	None	8
ANDM 213	Ruminant Animal Production	None	8
ANDM 221	Small Stock Production and Management	ANDM 121	16
ANDM 223	Beef Production and Management	ANDM 121	16
ANDM 225	Principles of Veld Management	None	16

ANDM 312	Poultry Production and Management	ANDM 121	16
ANDM 313	Dairy Production and Management	ANDM 121	16
ANDM 314	Pig Production and Management	ANDM 121	16
ANDM 321	Practical Animal Production	ANDM 121, ANDM 221, ANDM 223, ANDM 312; ANDM 313 and ANDM 314	6

Bachelor of Science in Agriculture – Animal Science

Module code	Descriptive name	Prerequisites	Credits
ANSM 121	Introduction to Agricultural Biometry	None	12
ANSM 211	Introduction to Animal Science	None	16
ANSM 214	Ruminant Production Science	None	8
ANSM 222	Animal Breeding and Genetics	None	8
ANSM 223	Animal Nutrition	None	16
ANSM 224	Non – Ruminant Production	None	8
WVNS 211	Understanding the World of Natural Science	None	12
WVAS 221	Understanding the World of Agriculture	None	12
ANSM 311	Principles of Veld Management	None	16
ANSM 312	Applied Agricultural Biometry	ANSM 121	16
ANSM 313	Agricultural Biochemistry	MCHE 114 and MCHE 123	12
ANSM 314	Physiology of Reproduction and Growth	AHPM 212 and AHPM 221	16
ANSM 321	Applied Ruminant Nutrition	ANSM 223	16
ANSM 322	Planted pastures and Fodder crops	None	8
ANSM 323	Quantitative Genetics	ANSM 222	16
ANSM 324	Smallstock Production and Science	ANSM 211	16
ANSM 411	Applied Monogastric nutrition	ANSM 223	16
ANSM 412	Applied Animal Breeding	ANSM 323	16
ANSM 413	Research Project and Seminar i	none	16
ANSM 414	Large Stock Production and Science	ANSM 211	8
ANSM 421	Research Project and seminar ii	ANSM 413	16
ANSM 422	Pig Science	ANSM 211	8
ANSM 423	Practical Experience	None	8
ANSM 424	Poultry Science	ANSM 211	16
ANSM 425	Dairy & Meat Sciences	ANSCM 313 and ANSM 314	16

Diploma in Plant Sciences

Module code	Descriptive name	Prerequisites	Credits
CSDM 111	Botany for Agriculture	None	12
CSDM 121	Introduction to Crop Production	None	12
CSDM 211	Intro. to Soil Science	None	16
CSDM 214	Farm Practical I	None	8
CSDM 212	Agricultural Climatology	None	12
CSDM 213	Farm Machinery	None	16
CSDM 215	Vegetable Production	CSDM 121	8
CSDM 222	Soil Fertility and Fertilizers	CSDM 211	8
CSDM221	Principles of Crop Improvement	None	16
CSDM 224	Farm Practical II	None	8

CSDM 223	Soil Conservation	CSDM 211	12
CSDM 225	Fruit Production	CSDM 121	8
CSDM 311	Agronomy of Summer Crops	CSDM 211 AND CSDM221	8
CSDM 312	Plant Protection	CSDM 214	16
CSDM315	Pedology and Soil Classification	CSDM 211 AND CSDM221	8
CSDM 321	Agronomy of Winter Crops	CSDM 211 AND CSDM221	8
CSDM 322	Weeds & Weeds Control	CSDM 312	16
CSDM 325	Practical Crop Production	None	8
CSDM 324	Elementary Irrigation	CSDM 211	16
CSDM 323	Elements of Agric. Microbiology	None	16
BSc Agric in Plant Sciences			
Module code	Descriptive name	Prerequisites	Credits
CSPM211	Introd. to Soil Science	None	16
CSPM212	Agric I Climatology	None	12
CSPM213	Farm Machinery	None	8
WVNS 211	Understanding the world of Natural Sciences	None	12
CSPM221	Intro to Crop Production	None	16
CSPM222	Soil Fertility and Fertilizers	CSPM221	16
CSPM223	Soil Conservation	CSPM211	12
CSPM224	Agricultural Microbiology	CSPM211	16
WVAS221	Understanding the world of Agriculture	None	12
CSPM311	Agron: Summer Crops	CSPM211 AND CSPM221	8
CSPM312	Plant Protection	CSPM221 AND CSPM224	16
CSPM313	Vegetable Production	CSPM221 AND CSPM222	16
CSPM321	Agron: Winter Crops	CSPM211 AND CSPM221	8
CSPM322	Weeds & Weed Control	CSPM313	16
CSPM323	Fruits Production	CSPM313	16
CSPM324	Principles of Irrigation	CSPM211	16
CSPM325	Plant Physiology	None	8
CSPM 411	Crop Production Systems	CSPM311 AND CSPM321	8
CSPM 412	Plant Breeding	None	16
CSPM 413	Horticultural Science	CSPM323	8
CSPM 414	Soil Chemistry	CSPM 211	8
CSPM 415	Pedology and Soil Clasifcation	CSPM 211	16
CSPM 416	Soil Physics	CSPM 211	8
CSPM417	Practical Crop Production I	None	8
CSPM418	Project and Seminar I	None	16
CSPM421	Crop Physiology	CSPM325	16
CSPM422	Crop Protection	CSPM311, CSPM321, CSPM322	16

CSPM 424	Soil Microbiology	CSPM 211 AND CSPM 224	16
CSPM427	Practical Crop Production II	None	8
CSPM428	Project and Seminar II	CSPM 418	16

Biology			
Module Code	Descriptive name	Prerequisites	Credits
SFBM 111	Introduction To Cell Biology	None	12
SFBM 121	Introduction To Biological Concepts	None	12
BIYM 111	Elements of Human Anatomy	None	12
BIYM 112	Elements of physiology	None	12
BIYM 114	Introduction to Microbiology	None	12
BIYM 121	Human Anatomical Systems	None	12
BIYM 122	Applied Biochemistry	None	12
BIYM 124	Systems Physiology	None	12
BIYM 123	Agric Zoology	None	12
BIYM 125	Agric Zoology	None	12
BIYM 221	Agric Biochemistry	None	12
BGYM 113	Introductory Biology	None	12
BGYM 123	Plant systematics and lower vertebrates	None	12
BGYM 212 (213)	Introductory Genetics	None	8
BGYM 214	Bacteriology and Microbial Ecology	BGYM 113 & 123	8
BGYM 215	Taxonomy	BGYM 113 & 123	8
BGYM 216	Ecology and Biostatistics	BGYM 113 & 123	8
BGYM 225	Immunology and Virology	BGYM 113 & 123	8
BGYM 226	Physiology & Intro to Entomology & Parasitology	BGYM 113 & 123	8
BGYM (221) 227	Advanced Molecular Genetics	BGYM 213	8
BGYM (311) 316	Advanced Ecology and Biostatistics II	BGYM 216	16
BGYM(222) 313	Bacterial Metabolism	BGYM 214	16
BGYM (321) 314	Appl. Micro and Microbial Diversity	BGYM 214	16
BGYM (312) 315	Systematics	BGYM 123	16
BGYM (322) 326	Industrial Microbiology and Biotechnology	BGYM 314	32
BGYM (311) 325	Physiology and Morphogenesis		32
BGYM 371	UNDERGRADUTE PROJECT		16

Chemistry			
Module code	Descriptive name	Prerequisites	Credits
SFCM 111	Foundation Chemistry I	None	12
SFCM 121	Foundation Chemistry II	None	12
MCHE 114	Introductory Chemistry I	None	12
MCHE 121	Introductory Chemistry II	None	12
MCHE 215	Physical Chemistry I	MCHE 114 or MCHE 121	8

MCHE 216	Inorganic Chemistry I	MCHE 114 or MCHE 121	8
MCHE 221	Organic Chemistry I	MCHE 114 or MCHE 121	8
MCHE 223	Analytical Chemistry I	MCHE 114 or MCHE 121	8
MCHE 315	Organic Chemistry II	MCHE 114, MCHE 121 MCHE 221	16
MCHE 316	Analytical Chemistry II	MCHE 114, MCHE 121, MCHE 223	16
MCHE 321	Physical Chemistry II	MCHE 114, MCHE 121, MCHE 215, PHYM 118, PHYM 124, MAYM 117, MAYM 127	16
MCHE 322	Inorganic Chemistry II	MCHE 114, MCHE 121, MCHE 216	16
Biochemistry			
Module code	Descriptive name	Prerequisites	CREDIT
BCHS 211	Introduction to Biochemistry	MCHE 121	8
BCHS 212	Introduction to Enzymology	MCHE 121	8
BCHS 221	Metabolic Processes I	BCHS 211 and 212	8
BCHS 222	Metabolic Processes II	BCHS 211 and 212	8
BCHS 314	Molecular and Cell Biology	BCHS 211 and 212	16
BCHS 315	Advanced Biochemistry and Molecular Physiology	BCHS 211 and 212	16
BCHS 324	Analytical Biochemistry	BCHS 211	16
BCHS 325	Project	BCHS 211 and 212	16
Microbiology			
Module code	Descriptive name	Prerequisites	CREDIT
MKBS M 211	Introduction to Microbiology	none	8
MKBS 212	Introduction to Microbial Genetics	none	8
MKBS 222	Microbial Diversity and Physiology (Bacteria, Fungi)	MKBS 211	8
MKBS 223	Introduction to Recombinant DNA Technology and Bioinformatics	MKBS 211	8
MKBS 316	Microbial Ecology	MKBS 221	16
MKBS 317	Environmental Microbiology and Public Health	MKBS 211	16
MKBS 326	Industrial Microbiology and Biotechnology	MKBS 211 and 212	16
MKBS 327	Virology and Immunology	MBSM 212	16
Computer Science			
Module code	Descriptive name	Prerequisites	Credits
CISM 111	Introduction to Computing	None	
CISM 122	Programming and Problem Solving	CISM 111	12
CISM 123	Programming Practicals	CISM 111	12
CISM 124	End User Computing	CISM 122,123	12
CISM 211	Algorithms Design and Data Structures	CISM 122,123	8
CISM 212	Imperative and Object oriented Languages	CISM 122,123	8
CISM 223	Architecture and Operating Systems	CISM 122,123	8

CISM 224	Introduction to Software Engineering	CISM 122,123	8
CISM 311	Introduction to Databases	CISM 211,212	16
CISM 312	Theory of Computation and Translation	CISM 211,212	8
CISM 323	Net-Centric Computing	CISM 211,212	8
CISM 324	Artificial Intelligence	CISM 211,212	16
CISM 325	Graphics	CISM 211,212	16
Electronics			
Module code	Descriptive name	Prerequisites	CREDIT
ELYM 115	Electricity, Magnetism and Circuits	D(SG) or E (HG) in Mathematics and at least an E in Physical Science	12
ELYM 127	Introduction to Electronics	D(SG) or E (HG) in Mathematics and at least an E in Physical Science	12
ELYM 215	Analogue Electronics and Systems	Pass in ELYM 115 and ELYM 127	16
ELYM 227	Digital Electronics and systems	Pass in ELYM 115 and ELYM 127	16
ELYM 315	Advanced Analogue Electronics	Pass in ELYM 215 and ELYM 227	16
ELYM 316	Introduction to Signals and Systems	Pass in ELYM 215 and ELYM 227	16
ELYM 327	Advanced Digital Techniques and systems	Pass in ELYM 215 and ELYM 227	16
ELYM 328	Introduction to Microcontroller systems	Pass in ELYM 215 and ELYM 227	16
Geography			
Module code	Descriptive name	Prerequisites	Credits
GEOM 113	Introduction to Physical Geography	None	12
GEOM 123	Introduction to Human Geography	None	12
GEOM 214	Human Geography	GEOM 113, GEOM 123	8
GEOM 215	Geographical Statistics and Computers	GEOM 113, GEOM 123	8
GEOM 224	Physical Geography	GEOM 113 , GEOM 123	8
GEOM 225	Aerial Photography and Remote Sensing	GEOM 113, GEOM 123	8
GEOM 316	Advanced Human Geography	GEOM 113, GEOM 123, GEOM 214	16
GEOM 317	Advanced Physical Geography	GEOM 113, GEOM 123, GEOM 224	16
GEOM 328	Introduction to Geographical Information Systems	GEOM 113, GEOM 123, GEOM 215, GEOM 225	16
GEOM 329	The Geography of African Development	GEOM 113, GEOM 123, GEOM 214	16
Applied Mathematics			
Module code	Descriptive name	Prerequisites	Credits
APMM 117	Introduction to Mechanics		12
APMM 127	Introduction to Numerical Methods and Mathematical Modelling		12
APMM 217	Mathematical Modelling	All first year	16

		modules in Mathematics and Applied Mathematics	
APMM 227	Differential Equations and Numerical Methods	All first year modules in Mathematics and Applied Mathematics	16
APMM 317	Mathematical Programming	All second year modules in Mathematics and Applied Mathematics	16
APMM 318	Differential Equations and their Applications	All second year modules in Mathematics and Applied Mathematics	16
APMM 327	Fluid Mechanics	All second year modules in Mathematics and Applied Mathematics	16
APMM 328	Numerical analysis	All second year modules in Mathematics and Applied Mathematics	16
Mathematics			
Module code	Descriptive name	Prerequisites	Credits
MAYM 117	Calculus I	Matric Mathematics level 4	12
MAYM 116	General Mathematics	Matric Mathematics level 4	12
MAYM 127	Calculus II		12
MAYM 217	Linear Algebra	All first year modules in Mathematics	16
MAYM 227	Advanced Calculus	All first year modules in Mathematics	16
MAYM 317	Real Analysis	All second year modules in Mathematics	16
MAYM 318	Differential Equations	All second year modules in Mathematics	16
MAYM 327	Complex Analysis	All second year modules in Mathematics	16
MAYM 328	Abstract Algebra	All second year modules in Mathematics	16

Nursing			
Module code	Descriptive name	Prerequisites	Credits
BIYM 111	Anatomy & Biophysics	None	12
SOCS 111	Sociology	None	12
NCHM 111	Community & Pracs	None	12
FNSM 111	Fundamentals Of Nursing	None	18
EPPM 111	Ethos & Professional Practice	None	6
AGLE111	Academic Literacy (TAG Tests)	None	12
BIYM 112	Anatomy & BIOPHYSICS	None	12
SOCS 122	Sociology	None	12
NCHM 122	Community & Pracs	None	12
FNSM 122	Fundamentals Of Nursing	None	18
BIYM 112	Microbiology	None	12
AGLE121	Academic Literacy (Compulsory)	None	12
NCHM 211	Community Health & Pracs	FNSM 111 & 122, NCHM111 & 122, EPPM 111, BIYM111 & BIYM121	12
PHMM 112	Pharmacology	FNSM 111 & 122, NCHM111 & 122, BIYM111 & BIY122	12
BIYM 121	Physiology & Biochemistry (1)	BIYM111 & 122	12
PSYC 111	Psychology	None	12
GNSM 111	General Nursing 1 Science & Pracs	FNSM 111 & 122, NCHM111 & 122, EPPM 111, BIYM111 & BIYM121	24
NCHM 222	Community Health & Pracs	FNSM 111 & 122, NCHM111 & 122, EPPM 111, BIYM111 & BIYM121	24
EPPM 221	Ethos & Professional Practice	EPPM 111	6
BIYM 122	Physiology & Biochemistry (2)	BIYM121	12
HPSY	Psychology	None	12
GNSM 122	General Nursing 1 Science & Pracs	FNSM 111 & 122, NCHM111 & 122, EPPM 111, BIYM111 & BIYM121	18
	Understanding World (None	12
GNSM 211	General Nursing 11 Science & Pracs	All 1 st and 2 nd year modules	12
MIYM 311	Midwifery 1 & Practicals	All 1 st and 2 nd year modules	24
PNSM 311	Psychiatric Nursing Science 1 & Practicals	All 1 st and 2 nd year modules	18
NCHM 311	Community Nursing Sciences 111 & Practicals	All 1 st and 2 nd year modules	6
GNSM 222	General Nursing 11 Science & Pracs	All 1 st and 2 nd year modules	12

MIYM 322	Midwifery 1 & Practicals	All 1 st and 2 nd year modules	24
PNSM 322	Psychiatric Nursing Science 1 & Practicals	All 1 st and 2 nd year modules	18
NCHM 322	Community Nursing Sciences 111 & Practicals	All 1 st and 2 nd year modules	6
GNSM 311	General Nursing Sciences 111 & Practicals	All 3 rd year modules	12
MIYM 411	Midwifery 11 & Practicals	All 3 rd year modules	18
PNSM 411	Psychiatric Nursing Science 11 & Practicals	All 3 rd year modules	18
NRMM 411	Nursing Research Methodology	All 3 rd year modules	12
GNSM 322	General Nursing Sciences 111 & Practicals	All 3 rd year modules	12
MIYM 422	Midwifery 11 & Practicals	All 3 rd year modules	120
PNSM 422	Psychiatric Nursing Science 11 & Practicals	All 3 rd year modules	18
NRPM 422	Nursing Research Project	All 3 rd year modules	12
NADM112	Ethos and Professional Practice	None	12
CHNM 111	Community Nursing Science	None	12
NADM 111	Nursing Management 1	None	12
NEDM 111	Nursing Education 1	None	12
	Academic Literacy 1	None	12
CHNM 112	Community Nursing Science	None	12
NADM 112	Nursing Management 1	None	12
NEDM 112	Nursing Education 1	None	12
	Academic Literacy 1	None	12
NADM 211	Nursing Management 11 and Pratical	NADM 112	24
CHNM 211	Community Nursing Science	CHNM 111	30
SOCS 131 / 141	Sociology	None	12
	Understanding	NADM 112	12
MANM 111	Introduction to management	None	12
NADM 222	Nursing Management 11 and Practicals	NADM 111	12
CHNM 222	Community Nursing Science	CHNM 111	12
SOCL 111	Sociology	SOCL 131/141	12
MANM 121	Management 1	None	
	Understanding the world	None	12
NADM 311	Nursing Management 11 and Pratical	NADM 211	18
CHNM 311	Community Nursing Science	CHNM 211, CHNM 222	18
NRMM 111	Nursing Research Methodology		12
HCOM 111	Public Relations	None	12
NADM 322	Nursing Management		18
NRPM 322	Nursing Research Project	NRMM 111	18
CHNM 322	Community Nursing Science 111 and Practicals		30
Physics			
Module code	Descriptive name	Prerequisites	Credits
PHYM 118	Mechanics and Heat Energy	50% Grade 12 Mathematics. Pass in Matric physical Science	12

PHYM 128	Basic Electromagnetism and Modern Physics	50% Grade 12 Mathematics. Pass in Matric physical Science	12
PHYM 215	Mechanics and Thermal Physics	50% average in PHYM 118 and PHYM 128	8
PHYM 216	Atomic Physics	50% average in PHYM 118 and PHYM 128	8
PHYM 221	Waves and Quantum Mechanics	50% average in PHYM 118 and PHYM 128	8
PHYM 222	Electricity and Magnetism	50% average in PHYM 118 and PHYM 128	8
PHYM 315	Classical Mechanics	PHYM215, PHYM216, PHYM221,PHYM 222	16
PHYM 316	Solid State Physics	PHYM 215, PHYM216, PHYM221,PHYM 222	16
PHYM 317	Quantum Mechanics	PHYM 215, PHYM216, PHYM221,PHYM 222	16
PHYM 318	Project and Research	PHYM 215, PHYM216, PHYM221,PHYM 222	16
PHYM 321	Electromagnetism	PHYM 215, PHYM216, PHYM221,PHYM 222	16
PHYM 322	Nuclear Physics	PHYM 215, PHYM216, PHYM221,PHYM 222	16
PHYM 323	Statistical Physics	PHYM 215, PHYM216, PHYM221,PHYM 222	16
PHYM 324	Project and Research	PHYM 215, PHYM216, PHYM221,PHYM 222	16

MA .1.7.4 CURRICULUM

DIPLOMA IN ANIMAL ANIMAL HEALTH N102M – 266-100

Purpose: The purpose of the qualification is to provide adequate vocational training which equips learners with a sound knowledge of disease surveillance, farm animals and production systems; and to identify problems related to the health, breeding, feeding, management and economics of livestock production, thus contributing to animal production whilst maintaining the animals' health and welfare, protecting humans from zoonoses and ensuring high-quality food products of animal origin for human consumption.ii. provide services to members of the veterinary profession, para-veterinary professionals, the animal population industry and the community as a whole.

Year level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	AHVM 211	16	AHVM 311	16
AHVM 111	12	AHVM 212	8	AHVM312	16
AHVM 112	8	ANDM 211	16	AHVM 313	8
AEDM 111	12	ANDM 212	8	AHVM 314	8
MAYM 115	12	AXDM 211	16	AHVM 315	8
		ANDM 213	8		
Total 1st semester	56	Total 1st semester	72	Total 1st semester	56
Year level 1		Year level 2		Year level 3	
Second semester		Second semester		Second semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 121	12	AHVM 221	16	AHVM 321	16
AHVM 121	12	AHVM 222	16	AHVM 322	16
AHVM 122	12	AHVM 223	16	AHVM 323	8
AHVM 123	8	AHVM 224	8	AHVM 324	8
ANDM 122	8	AHVM 225	8	AHVM 325	8
MAYM 125	12	ANDM 225	16		
Total 2nd semester	64	Total 2nd semester	80	Total 2nd semester	56
Total year level 1	120	Total year level 2	152	Total year level 3	112
Total credits for the curriculum 384					

After completion of the 3-year Diploma, a student can either exit with a diploma qualification or proceed to register for a degree of 2 years duration (240 credits). In this case the student will be credited with 240 credits and will have to earn another 240 credits.

DIPLOMA IN AGRIC IN ANIMAL SCIENCE N101M – 279 100

Purpose : The aim of the Diploma in Agriculture (Animal Science) is to give students a vocational training in the practical application of scientific principles to animal production.

Year level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	ANDM 211	16	AEDM 314	08
MCHE 115	12	AHVM 211	16	ANDM 312	16
AHVM 111	12	ANDM 212	08	ANDM 313	16
MAYM 115	12	AXDM 211	16	ANDM 314	16
AEDM 111	12			AXDM 311	08
Total 1st semester	60	Total 1st semester	56	Total 1st semester	64
Year level 1		Year level 2		Year level 3	
Second semester		Second semester		Second semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 121	12	ANDM 221	16	ANDM 321	56
AHVM 122	12	ANDM 223	16		
MAYM 125	12	ANDM 225	16		
CSDM 121	12	AHVM 226	16		
ANDM 121	12				
Total 2nd semester	60	Total 2nd semester	64	Total 2nd semester	56
Total year level 1	120	Total year level 2	120	Total year level 3	120
Total credits for the curriculum				360	

After completion of the 3-year Diploma, a student can either exit with a diploma qualification or proceed to register for a degree of 2 years duration (240 credits). In this case the student will be credited with 240 credits and will have to earn another 240 credits.

Diploma in Crop Science Programme N101M 279 101

Year level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr
MCHE 115	12	CSDM 211	16	CSDM 311	8
CSDM 111	12	CSDM 214	8	CSDM 312	16
MAYM 115	12	CSDM 212	12	AXDM 311	8
AGLE 111	12	AXDM 211	16	AEDM 314	8
AEDM 111	12	CSDM 213	8	CSDM315	8
		CSDM 215	8		
Total 1st semester	60	Total 1st semester	68	Total 1st semester	48
Year level 1		Year level 3		Year level 3	
Second semester		Second semester		Second semester	
Module code	Cr	Module code	Cr	Module code	Cr
MAYM 125	12	CSDM 222	16	CSDM 321	8
CSDM 121	12	CSDM221	16	CSDM 322	16
ANDM 121	12	CSDM 224	8	CSDM 325	8
PHYM128	12	CSDM 223	12	CSDM 324	16
AGLE 121	12	CSDM 225	8	CSDM 323	16
Total 2nd semester	60	Total 2nd semester	60	Total 2nd semester	64
Total year level 1	120	Total year level 2	128	Total year level 3	112
				TOTAL	360

After completion of the 3-year Diploma, a student can either exit with a diploma qualification or proceed to register for a degree of 3 years duration. The maximum credits carried over from the Diploma will not exceed 50% of the total credits for the degree.

BACHELOR OF SCIENCE IN AGRICULTURE IN ANIMAL HEALTH N401M – 267 101

Curriculum outcomes: Animal health technicians will be able to utilize their sound, research-based knowledge of disease surveillance, farm animals and production systems and be able to identify problems related to the health, breeding, feeding, management and economics of livestock production, thus contributing to animal production whilst maintaining the animals' health and welfare, protecting humans from zoonoses and ensuring high-quality food products of animal origin for human consumption.

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	AHPM 211	16	AHPM 311	16	AHPM 411	16
BGYM 113	12	AHPM 212	16	AHPM 312	8	AHPM 412	16
MCHE 114	12	ANSM 214	8	AHPM 313	16	AHPM 413	8
MAYM 116	12	AEXM 211	16	AHPM 314	8	AHPM 414	8
AECM 111	12	WVNS 211	12	ANSM 311	16	AHPM 415	16
Total 1st semester	60	Total 1st semester	68	Total 1st semester	64	Total 1st semester	64
Second semester		Second semester		Second semester		Second semester	
AGLE 121	12	AHPM 221	8	AHPM 321	16	AHPM 421	16
ANSM 121	12	AHPM 222	8	AHPM 322	16	AHPM 422	16
BGYM 123	12	ANSM 222	8	AHPM 323	16	AHPM 423	8
MCHE 121	12	ANSM 223	16	AHPM 324	8	AHPM 424	8
PHYM 129	12	ANSM 224	8	AHPM 325	8	AHPM 425	16
		WVAS 221	12			AHPM 426	8
Total 2nd sem	60	Total 2nd semester	60	Total 2nd semester	64	Total 2nd semester	72
Total Year level 1	120	Total Year level 2	128	Total Year level 3	128	Total Year level 4	136
Total credits for the curriculum 512							

Bachelor of Science in Agriculture in Animal Science N401M – 267 102

Purpose

The main aim of this programme is to offer an opportunity to students from different educational backgrounds into a sound applied science to become Professional Animal Scientists within the Agricultural Sector and related Industries. This will be achieved by designing a degree programme with in-built remedial aspects.

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
MCHE 114	12	ANSM 211	16	AECM 314	08	ANSM 411	16
BGYM 113	12	AHPM 212	16	ANSM 311	16	ANSM 412	16
MAYM 116	12	CSPM 211	16	ANSM 312	16	ANSM 413	16
AECM 111	12	AHPM 211	16	ANSM 313	08	ANSM 414	08
AGLE 111	12	WVNS 211	12	ANSM 314	16		
Total semester 1st	60	Total semester 1st	76	Total semester 1st	64	Total semester 1st	56
Year level 1		Year level 2		Year level 3		Year level 4	
Second semester		Second semester		Second semester		Second semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
MCHE 123	12	ANSM 223	16	ANSM 321	16	ANSM 421	16
BGYM 123	12	AHPM 222	08	ANSM 322	08	ANSM 422	08
PHYM 129	12	ANSM 222	08	ANSM 323	16	ANSM 423	16
ANSM 121	12	CSPM 221	16	ANSM 324	16	ANSM 424	16
AGLE 121	12	WVAS 221	12	AHPM 326	08	ANSM 425	08
				AEXM 324	08		
Total semester 2nd	60	Total semester 2nd	60	Total semester 2nd	72	Total semester 2nd	64
Total year level 1	120	Total year level 2	136	Total year level 3	136	Total year level 4	120
Total credits for the curriculum							512

Bachelor of Science in Agriculture in Agricultural Economics N401M - 267 100

Purpose

To provide the country with qualified personnel who can work as agricultural economists and are competent in research, appraising, developing, managing and evaluating agricultural development programmes and projects towards the betterment of agricultural business and rural community development in the country.

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
BGYM113	12	AEXM211	16	AECM311	16	AECM411	8
MCHE114	12	AEXM212	8	AECM312	8	AECM412	16
AGLE111	12	AECM213	8	CSPM313	16	AECM413	16
AECM111	12	CSPM211	16	AECM313	16	AECM414	16
MAYM116	12	ANSM211	16	AECM314	8	AECM415	16
		WVNS211	12				
Total 1st semester	60	Total 1st semester	76	Total 1st semester	64	Total 1st semester	72
Second semester		Second semester		Second semester		Second semester	
MCHE121	12	AECM221	8	AECM321	16	AECM421	8
BGYM123	12	AEXM222	8	AECM322	16	AECM422	16
PHYM129	12	CSPM221	16	AECM323	8	AECM423	8
ANSM121	12	ANSM223	16	AEXM324	8	AECM424	8
AGLE121	12	AECM223	8	AECM325	8	AECM425	16
		WVAS221	12				
Total 2nd semester	60	Total 2nd semester	68	Total 2nd semester	56	Total 2nd semester	56
Total year level 1	120	Total year level 1	144	Total year level 1	120	Total year level 1	128
Total credits for the curriculum			512				

Bachelor of Science in Agriculture in Crop Science N401M – 267 103

Purpose

To provide formal education and research training in Plant Sciences and related fields such as environment and land management towards the betterment of the agricultural sector in South Africa, regionally and internationally.

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
BGYM 113	12	CSPM211	16	CSPM311	8	CSPM411	8
MCHE 114	12	AEXM211	16	CSPM312	16	CSPM412/ CSPM415	16
MAYM 116	12	ANSM 211	16	CSPM313	16	CSPM413/ CSPM414	8
AGLE 111	12	CSPM212	12	AECM314	8	CSPM417	8
AECM 111	12	CSPM213	8	ANSM312	16	CSPM418	16
		WVNS 211	12				
Total semester 1st	60	Total semester 1st	80	Total 1st semester	64	Total 1st semester	56
Second semester		Second semester		Second semester		Second semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
BGYM 123	12	CSPM221	16	CSPM321	8	CSPM421	16
MCHE 121	12	CSPM222	16	CSPM322	16	CSPM422/C SPM424	16
PHYM 129	12	CSPM223	12	CSPM323	16	CSPM427	8
AGLE 121	12	CSPM224	16	CSPM324	16	CSPM428	16
ANSM121	12	WVAS221	12	CSPM325	8		
Total semester 2nd	60	Total semester 2nd	72	Total 2nd semester	64	Total 2nd semester	56
Total year level 1	120	Total year level 2	152	Total year level 3	128	Total year level 4	112
Total credits for the curriculum							512

Bachelor of Nursing Sciences (BNSc) 270 102 N111M

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
BIYM111	12	NCHM211	12	GNSM211	12	GNSM311	12
SOCL111	12	PHMM112	12	MIYM311	24	MIYM411	18
NCHM111	24	BIYM 112	12	PNSM311	18	PNSM411	18
FNSM111	18	PSYC111	12	NCHM311	6	NRMM411	12
EPPM111	6	GNSM111	24	AGWM 211	12		
AGLE111 or TAG TEST	12						
Total semester 1st	84	Total semester 1st	72	Total semester 1st	72	Total 1st semester	60
Second semester		Second semester		Second semester		Second semester	
BIYM 121	12	NCHM222	24	GNSM222	12	GNSM321	18
SOCL121	12	EPPM221	6	MIYM322	24	MIYM422	18
NCHM122	12	BIYM124	12	PNSM322	18	PNSM422	18
FNSM122	18	PSYC121	12	NCHM322	6	NRPM422	12
AGLE121	12	GNSM122	18				
		AGWM 221	12				
Total semester 2nd	66	Total semester 2nd	84	Total semester 2nd	60	Total 2nd semester	66
Total year level 1	150	Total year level 1	156	Total year level 1	132	Total year level 1	126
Total credits for the curriculum		564					

Bachelor of Nursing(BN)

PURPOSE

1. To develop professional nurses to be competent managers, educators and health care providers, in all the spheres of health care delivery.
2. Provide learning and teaching opportunities for individuals through the use of creative teaching and learning strategies, for the optimal health of the community.

- 3 Provide comprehensive health services to the individuals, families and communities within the national health philosophy and mission by applying primary health care approach.

EXIT OUTCOMES

1. Manage and evaluate educational interventions for clients and health care personnel within the legal and ethical framework.
2. Plan, implement and evaluate research in collaboration with other health care team members.
3. Manage and evaluate specialized nursing services at district, provincial and national levels within the constraints of national health policy and international guidelines and in different settings.
4. Plan implement and evaluate community health care services at district, provincial and national levels.

Bachelor Of Nursing 269 100

BN (Management) N109M

Year level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr
NADM112	12	NADM 211	24	NADM 311	18
CHNM 111	12	CHNM 211	30	CHNM 311	18
NADM 111	12	SOCL 111	12	NRMM 311	12
NEDM 111	12	MANM 111	12	HCOM 111	12
AGLE 111	12				
Total 1st semester	60	Total 1st semester	78	Total 1st semester	60
Year level 1		Year level 3		Year level 3	
Second semester		Second semester		Second semester	
Module code	Cr	Module code	Cr	Module code	Cr
CHNM 122	12	NADM 222	24	NADM 322	18
NADM 121	12	CHNM 222	30	NRPM 322	12
NEDM 122	12	SOCL 121	12	CHNM 322	30
AGLE 121	12	MANM 121	12		
Total 2nd semester	48	Total 2nd semester	78	Total 2nd semester	60
Total year level	108	Total year level	156	Total year level 3	120
Total credits for the curriculum		384			

BN EDUCATION N110M 269 101

Year level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr
NADM112	12	NEDM 211	24	NEDM 311	18
CHNM 111	12	CHNM 211	30	CHNM 311	18
NADM 111	12	SOCL 111	12	NRMM 311	12
NEDM 111	12	MANM 111	12	HCOM 111	12
AGLE 111	12				
Total 1st semester	60	Total 1st semester	78	Total 1st semester	60
Year level 1		Year level 2		Year level 3	
Second semester		Second semester		Second semester	
Module code	Cr	Module code	Cr	Module code	Cr
CHNM 122	12	NEDM 222	24	NEDM 322	18
NADM 121	12	CHNM 222	30	CHNM322	30
NEDM 122	12	SOCL 121	12	NRPM322	12
AGLE 121	12	MANM 121	12		
Total 2nd semester	48	Total 2nd semester	78	Total 2nd semester	60
Total year level 1	108	Total year level 2	156	Total year level 3	120
Total credits for the curriculum 384					

1. BSc Extended (Applied Mathematics - Chemistry) N302M 200 192

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFCM 111	12	AGLE 111	12	WVNS 211	12	APMM 317	16
SFMM111	12	APMM 117	12	APMM 217	16	APMM 318	16
SFPM 111	12	MCHE 114	12	MCHE 215	8	MCHE 315	16
SFSM 111	12	MAYM 117	12	MCHE 216	8	MCHE 316	16
SFIM 111	12	PHYM 118	12	MAYM 217	16		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFCM 121	12	AGLE 121	12	WVNS 221	12	APMM 327	16
SFMM 121	12	APMM 127	12	APMM 227	16	APMM 328	16
SFPM 121	12	MCHE 121	12	MCHE 221	8	MCHE 321	16
SFSM 121	12	MAYM 127	12	MCHE 222	8	MCHE 322	16
SFIM 121	12	PHYM 128	12	MAYM 227	16		
SEM 2 TOTAL	60	SEM 2 TOTAL	60	SEM 2 TOTAL	60	SEM 2 TOTAL	64
YEAR TOTAL 1	120	YEAR TOTAL 2	120	YEAR TOTAL 3	120	YEAR TOTAL 4	128
CURRICULUM TOTAL 488							

2. BSc Extended (Applied Mathematics - Electronics) N302M 200193

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFCM 111	12	AGLE 111	12	WVNS 211	12	APMM 317	16
SFMM111	12	APMM 117	12	APMM 217	16	APMM 318	16
SFPM 111	12	MAYM 117	12	MAYM 217	16	ELYM 315	16
SFSM 111	12	ELYM 115	12	ELYM 215	16	ELYM 316	16
SFIM 111	12	CISM 111	12				
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFCM 121	12	AGLE 121	12	WVNS 221	12	APMM 327	16
SFMM 121	12	APMM 127	12	APMM 227	16	APMM 328	16
SFPM 121	12	MAYM 127	12	MAYM 227	16	ELYM 327	16
SFSM 121	12	ELYM 127	12	ELYM 227	16	ELYM 328	16
SFIM 121	12	CISM 124	12				
SEM 2 TOTAL	60	SEM 2 TOTAL	60	SEM 2 TOTAL	60	SEM 2 TOTAL	64
YEAR TOTAL 1	120	YEAR TOTAL 2	120	YEAR TOTAL 3	120	YEAR TOTAL 4	128
CURRICULUM TOTAL 488							

3. BSc Extended (Applied Mathematics - Mathematics) N 302 M 200 158

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
SFCM 111	12	AGLE 111	12	WVNS 211	12	APMM 317	16
SFMM111	12	APMM 117	12	APMM 217	16	APMM 318	16
SFPM 111	12	PHYM 118	12	PHYM 215	8	MAYM 317	16
SFSM 111	12	MAYM 117	12	PHYM 216	8	MAYM 318	16
		CISM 111	12	MAYM 217	16		
Total 1st sem	48	Total 1st sem	60	Total 1st sem	60	Total 1st sem	64
Second semester		Second semester		Second semester		Second semester	
SFCM 121	12	AGLE 121	12	WVNS 221	12	APMM 327	16
SFMM 121	12	APMM 127	12	APMM 227	16	APMM 328	16
SFPM 121	12	PHYM 124	12	PHYM 221	8	MAYM 327	16
SFSM 121	12	MAYM 127	12	PHYM 222	8	MAYM 328	16
		CISM 124	12	MAYM 227	16		
Total 2nd sem	48	Total 2nd sem	60	Total 2nd sem	60	Total 2nd sem	64
Total year level 1	96	Total year level 1	120	Total year level 1	120	Total year level 1	128
Total credits for the curriculum 488							

4. BSc Extended (Applied Mathematics – Physics) N301M 200194

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFCM 111	12	AGLE 111	12	WVNS 211	12	APMM 317	16
SFMM111	12	APMM 117	12	APMM 217	16	APMM 318	16
SFPM 111	12	PHYM 118	12	PHYM 215	8	PHYM 315	8
SFSM 111	12	MAYM 117	12	PHYM 216	8	PHYM 316	8
SFIM 111	12	CISM 111	12	MAYM 217	16	PHYM 317	8
						PHYM 318	8
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFCM 121	12	AGLE 121	12	WVNS 221	12	APMM 327	16
SFMM 121	12	APMM 127	12	APMM 227	16	APMM 328	16
SFPM 121	12	PHYM 128	12	PHYM 221	8	PHYM 321	8
SFSM 121	12	MAYM 127	12	PHYM 222	8	PHYM 322	8
SFIM 121	12	CISM 124	12	MAYM 227	16	PHYM 323	8
						PHYM 324	8
SEM 2 TOTAL	60	SEM 2 TOTAL	60	SEM 2 TOTAL	60	SEM 2 TOTAL	64
YEAR 1 TOTAL	120	YEAR 2 TOTAL	120	YEAR 3 TOTAL	120	YEAR 4 TOTAL	128
CURRICULUM TOTAL 488							

5. BSc Extended (Biology - Chemistry N 302 M 200 159)

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
SFBM 111	12	AGLE 111	12	BGYM 213	8	BGYM 314	16
SFCM 111	12	BGYM 113	12	BGYM 214	8	BGYM 313	16
SFMM 111	12	PHYM 118	12	MCHE 215	8	MCHE 315	16
SFPM 111	12	MAYM 116	12	MCHE 216	8	MCHE 316	16
SFSM 111	12	MCHE 114	12	PHYM 215	8		
				PHYM 216	8		
				WVNS 211	12		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1TOTAL	64
Year level 1		Year level 2		Year level 3		Year level 4	
Second semester		Second semester		Second semester		Second semester	
Module code	CR	Module code	Cr	Module code	Cr	Module code	Cr
SFBM 121	12	AGLE 121	12	WVNS 221	12	BGYM 326	32
SFCM 121	12	MCHE 121	12	MCHE 221	8	MCHE 322	16
SFPM 121	12	PHYM 128	12	MCHE 223	8	MCHE 321	16
SFSM 121	12	MAYM 126	12	BGYM 227	8		
SFMM 121	12	BGYM 123	12	BGYM 225	8		
				PHYM 221	8		
				PHYM 222	8		
Total 2nd SEM	60	Total 2nd SEM	60	Total 2nd SEM	60	Total 2nd SEM	64
YEAR 1	120	YEAR 2	120	YEAR 3	120	YEAR 4	128
Total credits for the curriculum 488							

6.BSc Extended (Chemistry - Mathematics) N301M 200 195

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFCM 111	12	AGLE 111	12	WVNS 211	12	MAYM 317	16
SFMM111	12	MCHE 114	12	MCHE 215	8	MAYM 318	16
SFPM 111	12	PHYM 118	12	MCHE 216	8	MCHE 315	16
SFSM 111	12	MAYM 117	12	MAYM 217	16	MCHE 316	16
SFIM 111	12	CISM 111	12	PHYM 215	8		
				PHYM 216	8		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFCM 121	12	AGLE 121	12	WVNS 221	12	MAYM 327	16
SFMM 121	12	MCHE 121	12	MCHE 221	8	MAYM 328	16
SFPM 121	12	PHYM 128	12	MCHE 223	8	MCHE 321	16
SFSM 121	12	MAYM 127	12	MAYM 227	16	MCHE 322	16
SFIM 121	12	CISM 124	12	PHYM 221	8		
				PHYM 222	8		
SEM 2 TOTAL	60	SEM 2 TOTAL	60	SEM 2 TOTAL	60	SEM 2 TOTAL	64
YEAR 1	120	YEAR 2	120	YEAR 3	120	YEAR 4	128
CURRICULUM TOTAL 488							

7. Curriculum: Extended (Chemistry - Physics) N302M 200 160

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
SFCM 111	12	AGLE 111	12	WVNS 211	12	PHYM 315	8
SFMM111	12	MCHE 114	12	MCHE 215	8	PHYM 316	8
SFPM 111	12	PHYM 118	12	MCHE 216	8	PHYM 317	8
SFSM 111	12	MAYM 117	12	MAYM 217	16	PHYM 318	8
SFBM 111	12	CISM 111	12	PHYM 215	8	MCHE 315	16
				PHYM 216	8	MCHE 316	16
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
Second semester		Second semester		Second semester		Second semester	
SFCM 121	12	AGLE 121	12	WVNS 221	12	PHYM 321	8
SFMM 121	12	MCHE 121	12	MCHE 221	8	PHYM 322	8
SFPM 121	12	PHYM 124	12	MCHE 223	8	PHYM 323	8
SFSM 121	12	MAYM 127	12	MAYM 227	16	PHYM 324	8
SFBM 121	12	CISM 124	12	PHYM 221	8	MCHE 321	16
				PHYM 222	8	MCHE 322	16
Total semester 2nd	60	Total semester 2nd	60	Total semester 2nd	60	Total semester 2nd	64
Total year level 1	120	Total year level 1	120	Total year level 1	120	Total year level 1	128
Total credits for the curriculum				488			

8.BSc Extended (Computer Science - Chemistry) N301M 200 197

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFCM 111	12	AGLE 111	12	WVNS 211	12	MCHE 315	16
SFMM111	12	CISM 111	12	CISM 211	12	MCHE 316	16
				CISM 212	12	CISM 311	24
SFPM 111	12	MAYM 117	12	MAYM 217	16		
SFSM 111	12	MCHE 114	12	MCHE 215	8		
SFIM 111	12	PHYM 118	12	MCHE 216	8		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	68	SEM 1 TOTAL	56
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFCM 121	12	AGLE 121	12	WVNS 221	12	MCHE 321	16
SFMM 121	12	CISM 124	12	CISM 223	12	MCHE 322	16
				CISM 224	12	CISM 323	24
SFPM 121	12	MAYM 127	12	MAYM 227	16		
SFSM 121	12	MCHE 121	12	MCHE 221	8		
SFIM 121	12	PHYM 128	12	MCHE 223	8		
SEM 2 TOTAL	60	SEM 2 TOTAL	60	SEM 2 TOTAL	68	SEM 2 TOTAL	56
YEAR TOTAL	1 120	YEAR TOTAL	2 120	YEAR TOTAL	3 136	YEAR TOTAL	4 112
CURRICULUM TOTAL 488							

9. Curriculum: Extended (Computer Science - Electronics) N302M 200 161

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
SFCM 111	12	AGLE 111	12	WVNS 211	12	CISM 311	24
SFMM111	12	CISM 111	12	CISM 211	12	ELYM 315	16
SFPM 111	12	ELYM 115	12	CISM 212	12	ELYM 316	16
SFSM 111	12	MAYM 117	12	ELYM 215	16		
SFIM 111	12	PHYM 118	12	MAYM217	16		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	68	SEM 1 TOTAL	56
Second semester		Second semester		Second semester		Second semester	
SFCM 121	12	AGLE 121	12	WVNS 221	12	CISM 323	24
SFMM 121	12	CISM 122	12	CISM 223	12	ELYM 327	16
SFPM 121	12	CISM 123	6	CISM 224	12	ELYM 328	16
SFSM 121	12	ELYM 127	12	ELYM 227	16		
SFIM 121	12	MAYM 127	12	MAYM 227	16		
		PHYM 128	12				
Total 2nd semester	60	Total 2nd semester	66	Total 2nd semester	68	Total 2nd semester	56
Total year level 1	120	Total year level 1	126	Total year level 1	136	Total year level 1	112
Total credits for the curriculum = 494							

10. Curriculum: Extended (Computer Science - Mathematics) N302M 200 162

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
SFCM 111	12	AGLE 111	12	WVNS 211	12	CISM 311	24
SFMM111	12	CISM 111	12	CISM 211	12	MAYM 317	16
SFPM 111	12	PHYM 118	12	CISM 212	12	MAYM 318	16
SFSM 111	12	MAYM 117	12	MAYM 217	16		
SFBM 111	12	APMM 117	12	APMM 217	16		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	56
Second semester		Second semester		Second semester		Second semester	
SFCM 121	12	AGLE 121	12	WVNS 221	12	CISM 323	24
SFMM 121	12	CISM 122	12	CISM 223	12	MAYM 327	16
SFPM 121	12	CISM 123	6	CISM 224	12	MAYM 328	16
SFSM 121	12	MAYM 127	12	MAYM 227	16		
SFBM 121	12	APMM 127	12	APMM 227	16		
		PHYM 128	12				
Total 2nd semester	60	Total 2nd semester	66	Total 2nd semester	68	Total 2nd semester	56
Total year level 1	120	Total year level 1	126	Total year level 1	136	Total year level 1	112
Total credits for the curriculum = 494							

11. BSc Extended (Computer Science - Physics) N301M 200 200

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFCM 111	12	AGLE 111	12	WVNS 211	12	CISM 311	24
SFMM111	12	CISM 111	12	CISM 211	12	PHYM 315	8
SFPM 111	12	PHYM 118	12	CISM 212	12	PHYM 316	8
SFSM 111	12	MAYM 117	12	PHYM 215	8	PHYM 317	8
SFIM 111	12	MCHE 114	12	PHYM 216	8	PHYM 318	8
				MAYM 217	16		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	68	SEM 1 TOTAL	56
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFCM 121	12	AGLE 121	12	WVNS 221	12	CISM 323	24
SFMM 121	12	CISM 122	12	CISM 223	12	PHYM 321	8
SFPM 121	12	PHYM 128	12	CISM 224	12	PHYM 322	8
SFSM 121	12	MAYM 127	12	PHYM 221	8	PHYM 323	8
SFIM 121	12	MCHE 121	12	PHYM 222	8	PHYM 324	8
				MAYM 227	16		
SEM 2 TOTAL	60	SEM 2 TOTAL	60	SEM 2 TOTAL	68	SEM 2 TOTAL	56
YEAR 1 TOTAL	120	YEAR 2 TOTAL	120	YEAR 3 TOTAL	136	YEAR 4 TOTAL	112
CURRICULUM TOTAL 488							

12. Curriculum: Extended (Electronics - Mathematics) N302M 200 163

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
SFCM 111	12	AGLE 111	12	WVNS 211	12	MAYM 317	16
SFMM111	12	ELYM 115	12	ELYM 215	16	MAYM 318	16
SFPM 111	12	APMM 117	12	APMM 217	16	ELYM 315	16
SFSM 111	12	MAYM 117	12	MAYM 217	16	ELYM 316	16
SFBM 111	12	CISM 111	12				
SEM 1	60	SEM 1	60	SEM 1	60	SEM 1	64
TOTAL		TOTAL		TOTAL		TOTAL	
Second semester		Second semester		Second semester		Second semester	
SFCM 121	12	AGLE 121	12	WVNS 221	12	MAYM 327	16
SFMM 121	12	ELYM 127	12	ELYM 227	16	MAYM 328	16
SFPM 121	12	APMM 127	12	APMM 227	16	ELYM 327	16
SFSM 121	12	MAYM 127	12	MAYM 227	16	ELYM 328	16
SFBM 121	12	CISM 124	12				
Total 2nd semester	60	Total 2nd semester	60	Total 2nd semester	60	Total 2nd semester	64
Total year level 1	120	Total year level 1	120	Total year level 1	120	Total year level 1	128
Total credits for the curriculum 488							

13. BSc Extended (Electronics - Physics) N301M 200 196

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMETER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFCM 111	12	AGLE 111	12	WVNS 211	12	PHYM 315	8
SFMM111	12	ELYM 115	12	ELYM 215	16	PHYM 316	8
SFPM 111	12	PHYM 118	12	PHYM 215	8	PHYM 317	8
SFSM 111	12	MAYM 117	12	PHYM 216	8	PHYM 318	8
SFIM 111	12	CISM 111	12	MAYM 217	16	ELYM 315	16
						ELYM 316	16
SEM 1	60	SEM 1	60	SEM 1	60	SEM 1	64
TOTAL		TOTAL		TOTAL		TOTAL	
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFCM 121	12	AGLE 121	12	WVNS 221	12	PHYM 321	8
SFMM 121	12	ELYM 127	12	ELYM 227	16	PHYM 322	8
SFPM 121	12	PHYM 128	12	PHYM 221	8	PHYM 323	8
SFSM 121	12	MAYM 127	12	PHYM 222	8	PHYM 324	8
SFIM 111	12	CISM 124	12	MAYM 227	16	ELYM 327	16
						ELYM 328	16
SEM 2	60	SEM 2	60	SEM 2	60	SEM 2	64
TOTAL		TOTAL		TOTAL		TOTAL	
YEAR 1	120	YEAR 2	120	YEAR 3	120	YEAR 4	128
TOTAL		TOTAL		TOTAL		TOTAL	
CURRICULUM TOTAL 488							

14. Curriculum: Extended (Mathematics - Physics) N302M 200 164

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
SFCM 111	12	AGLE 111	12	WVNS 211	12	MAYM 317	16
SFMM111	12	ELYM 115	12	ELYM 215	16	MAYM 318	16
SFPM 111	12	PHYM 118	12	PHYM 215	8	PHYM 315	8
SFSM 111	12	MAYM 117	12	PHYM 216	8	PHYM 316	8
SFBM 111	12	CISM 111	12	MAYM 217	16	PHYM 317	8
						PHYM 318	8
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
Second semester		Second semester		Second semester		Second semester	
SFCM 121	12	AGLE 121	12	WVNS 221	12	MAYM 327	16
SFMM 121	12	ELYM 127	12	ELYM 227	16	MAYM 328	16
SFPM 121	12	PHYM 128	12	PHYM 221	8	PHYM 321	8
SFSM 121	12	MAYM 127	12	PHYM 222	8	PHYM 322	8
SFBM 121	12	CISM 124	12	MAYM 227	16	PHYM 323	8
						PHYM 324	8
Total 2nd semester	60	Total 2nd semester	60	Total 2nd semester	60	Total 2nd semester	64
Total year level 1	120	Total year level 1	120	Total year level 1	120	Total year level 1	128
Total credits for the curriculum		488					

15. Curriculum: Extended (Statistics - Mathematics) N302M 200 165

Year level 1		Year level 2		Year level 3		Year level 4	
First semester		First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
SFCM 111	12	AGLE 111	12	WVNS 211	12	MAYM 317	16
SFMM111	12	MAYM 117	12	MAYM 217	16	MAYM 318	16
SFPM 111	12	STFM 111	12	STFM 211	8	STFM 311	16
SFSM 111	12	APMM 117	12	STFM 212	8	STFM 312	16
SFBM 111	12	CISM 111	12	APMM 217	16		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
Second semester		Second semester		Second semester		Second semester	
SFCM 121	12	AGLE 121	12	WVNS 221	12	MAYM 327	16
SFMM 121	12	MAYM 127	12	MAYM 227	16	MAYM 328	16
SFPM 121	12	STFM 121	12	STFM 221	8	STFM 321	16
SFSM 121	12	APMM 127	12	STFM 222	8	STFM 322	16
SFBM 121	12	CISM 124	12	APMM 227	16		
Total 2nd semester	60	Total 2nd semester	60	Total 2nd semester	60	Total 2nd semester	64
Total year level 1	120	Total year level 1	120	Total year level 1	120	Total year level 1	128
Total credits for the curriculum		488					

BSC MAINSTREAM

1. Curriculum: BSc (Applied Mathematics – Chemistry) N302M 200169

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	APMM 317	16
APMM 117	12	APMM 217	16	APMM 318	16
MCHE 114	12	MCHE 215	8	MCHE 315	16
MAYM 117	12	MCHE 216	8	MCHE 316	16
PHYM 118	12	MAYM 217	16		
Total semester 1st	60	Total semester 1st	60	Total Semester 1st	64
Second semester		Second Semester		Second semester	
AGLE 121	12	WVNS 221	12	APMM 327	16
APMM 127	12	APMM 227	16	APMM 328	16
MCHE 121	12	MCHE 221	8	MCHE 321	16
MAYM 127	12	MCHE 223	8	MCHE 322	16
PHYM 128	12	MAYM 227	16		
Total 2nd semester	60	Total semester 2nd	60	Total semester 2nd	64
Total year level 1	120	Total year level 2	120	Total year level 3	128
Total credits for the curriculum					368

2. Curriculum: BSc (Applied Mathematics – Electronics) N303M 200 171

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	APMM 317	16
APMM 117	12	APMM 217	16	APMM 318	16
MAYM 117	12	MAYM 217	16	ELYM 315	16
ELYM 115	12	ELYM 215	16	ELYM 316	16
CISM 111	12				
Total semester 1st	60	Total semester 1st	60	Total Semester 1st	64
Second semester		Second Semester		Second semester	
AGLE 121	12	WVNS 221	12	APMM 327	16
APMM 127	12	APMM 227	16	APMM 328	16
MAYM 127	12	MAYM 227	16	ELYM 327	16
ELYM 127	12	ELYM 227	16	ELYM 328	16
CISM 124	12				
Total semester 2nd	60	Total semester 2nd	60	Total semester 2nd	64
Total year level 1	120	Total year level 2	120	Total year level 3	128
Total credits for the curriculum					368

3. Curriculum: BSc (Applied Mathematics - Mathematics) N305M 200 172

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	APMM 317	16
APMM 117	12	APMM 217	16	APMM 318	16
PHYM 118	12	PHYM 215	8	MAYM 317	16
MAYM 117	12	PHYM 216	8	MAYM 318	16
CISM 111	12	MAYM 217	16		
Total 1st semester	60	Total 1st semester	60	Total 1st Semester	64
Second semester		Second Semester		Second semester	
AGLE 121	12	WVNS 221	12	APMM 327	16
APMM 127	12	APMM 227	16	APMM 328	16
PHYM 128	12	PHYM 221	8	MAYM 327	16
MAYM 127	12	PHYM 222	8	MAYM 328	16
CISM 124	12	MAYM 227	16		
Total 2nd semester	60	Total 2nd semester	60	Total 2nd semester	64
Total year level 1	120	Total year level 2	120	Total year level	128
Total credits for the curriculum					368

4. Curriculum: BSc (Applied Mathematics – Physics) N304M - 200152

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	APMM 317	16
APMM 117	12	APMM 217	16	APMM 318	16
PHYM 118	12	PHYM 215	8	PHYM 315	8
MAYM 117	12	PHYM 216	8	PHYM 316	8
CISM 111	12	MAYM 217	16	PHYM 317	8
				PHYM 318	8
Total 1st sem	60	Total 1st semester	60	Total 1st sem	64
Second semester		Second Semester		Second semester	
AGLE 121	12	WVNS 221	12	APMM 327	16
APMM 127	12	APMM 227	16	APMM 328	16
PHYM 128	12	PHYM 221	8	PHYM 321	8
MAYM 127	12	PHYM 222	8	PHYM 322	8
CISM 124	12	MAYM 227	16	PHYM 323	8
				PHYM 324	8
Total 2nd sem	60	Total 2nd semester	60	Total 2nd sem	64
Total year level 1	120	Total year level 2	120	Total year level 3	128
Total credits for the curriculum					368

5. Curriculum: BSc (BIOCHEMISTRY AND CHEMISTRY) N174M – 200190

Year Level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Credits	Module code	Credits	Module code	Credits
AGLE 111	12	WVNS 211	12	BCHS 311	16
BGYM 113	12	MKBS 211	8	BCHS 312	16
MAYM 116	12	MKBS 212	8	MCHE 315	16
MCHE 114	12	MCHE 215	8	MCHE 316	16
PHYM 118	12	MCHE 216	8		
		BCHS 211	8		
		BCHS 212	8		
Total 1st semer	60	Total 1st sem	60	Total 1st sem	64
Second semester		Second semester		Second semester	
Module code	Credits	Module code	Credits	Module code	Credits
BGYM 123	12	WVNS 221	12	BCHS 321	16
PHYM 128	12	MKBS 223	8	BCHS 322	16
MAYM 126	12	MKBS 222	8	MCHE 321	16
AGLE 121	12	MCHE 221	8	MCHE 322	16
MCHE 121	12	MCHE 223	8		
		BCHS 221	8		
		BCHS 222	8		
Total 2nd sem	60	Total 2nd sem	60	Total 2nd semester	64
Total credits for the curriculum: 368					

6. Curriculum: BSc MICROBIOLOGY AND BIOCHEMISTRY) N167M - 200118

Year Level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Credits	Module code	Credits	Module code	Credits
AGLE 111	12	WVNS 211	12	MKBS 316	16
BGYM 113	12	MKBS 211	8	MKBS 317	16
MAYM 116	12	MKBS 212	8		
		BCHS 211	8		
MCHE 114	12	BCHS 212	8	BCHS 314	16
PHYM 118	12	MCHE 215	8	BCHS 315	16
		MCHE 216	8		
Total 1st semr	60	Total 1st semester	60	Total 1st sem	64
Second semester		Second semester		Second semester	
Module code	Credits	Module code	Credits	Module code	Credits
BGYM 123	12	WVNS 221	12	MKBS 326	16
MCHE 121	12	MKBS 223	8	MKBS 327	16
PHYM 128	12	MKBS 222	8	BCHS 324	16
MAYM 126	12	BCHS 221	8	BCHS 325	16
AGLE 121	12	BCHS 222	8		
		MCHE 221	8		
		MCHE 223	8		
Total 2nd sem	60	Total 2nd sem	60	Total 2nd sem	64
Total credits for the curriculum: 368					

7. Curriculum: BSc (MICROBIOLOGY AND CHEMISTRY) N168M – 200118

Year Level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Credits	Module code	Credits	Module code	Credits
AGLE 111	12	WVNS 211	12	MKBS 316	16
BGYM 113	12	MKBS 211	8	MKBS 317	16
MAYM 116	12	MKBS 212	8	MCHE 315	16
MCHE 114	12	MCHE 215	8	MCHE 316	16
PHYM 118	12	MCHE 216	8		
		BCHS 211	8		
		BCHS 212	8		
Total 1st sem	60	Total 1st sem	60	Total 1st sem	64
Second semester		Second semester		Second semester	
Module code	Credits	Module code	Credits	Module code	Credits
AGLE 121	12	WVNS 221	12	MKBS 326	16
BGYM123	12	MKBS 223	8	MKBS 327	16
MAYM 126	12	MKBS 222	8	MCHE 322	16
MCHE 121	12	MCHE 221	8	MCHE 321	16
PHYM 128	12	MCHE223	8		
		BCHS 221	8		
		BCHS 222	8		
Total 2nd sem	60	Total 2nd sem	60	Total 2nd sem	64
Total Credits: 368					

8. Curriculum: BSc (Biology - Chemistry) N301M - 200 173

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	BGYM 313	16
BGYM 113	12	BGYM 213	8	BGYM 314	16
MAYM 116	12	BGYM 214	8	MCHE 315	16
MCHE 114	12	MCHE 215	8	MCHE 316	16
PHYM 118	12	MCHE 216	8		
		PHYM 215	8		
		PHYM 216	8		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
BGYM 123	12	WVNS 221	12	BGYM 326	32
MCHE 121	12	BGYM 227	8	MCHE 321	16
PHYM 128	12	BGYM 225	8	MCHE 322	16
MAYM 126	12	PHYM 221	8		
ALGE 121	12	PHYM 222	8		
		MCHE 221	8		
		MCHE 223	8		
Total semester 2nd	60	Total semester 2nd	60	Total semester 2nd	64
Total year level 1	120	Total year level 2	120	Total year level 3	128
Total credits for the curriculum					368

9. Curriculum: BSc (Biology - Geography) N301M – 200 174

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	BGYM 316	16
CISM 111	12	BGYM 215	8	BGYM 315	16
MAYM 116	12	BGYM 216	8	GEOM 316	16
GEOM 113	12	GEOM 214	8	GEOM 317	16
BGYM 113	12	GEOM 215	8		
		CISM 211	12		
		CISM 212	12		
SEM 1 TOTAL	60	SEM 1 TOTAL	68	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121	12	WVNS 222	12	BGYM 326	32
CISM 124	12	BGYM 226	16	GEOM 328	16
MAYM 126	12	GEOM 224	8	GEOM 329	16
BGYM 123	12	GEOM 225	8		
GEOM 123	12	CISM 223	12		
		CISM 224	12		
Total 2nd sem	60	Total 2nd sem	68	Total 2nd sem	64
Total year level 1	120	Total year level 2	136	Total year level 3	128
Total credits for the curriculum					384

10. Curriculum: BSc Chemistry – Computer Science N120M – 200 130

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	MCHE 315	16
CISM 111	12	CISM 211	12	MCHE 316	16
MAYM 117	12	CISM 212	12	CISM 311	24
MCHE 114	12	MAYM 217	16		
PHYM 118	12	MCHE 215	8		
		MCHE 216	8		
SEM 1 TOTAL	60	SEM 1 TOTAL	68	SEM 1 TOTAL	56
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121	12	WVNS 221	12	MCHE 321	16
CISM 122	12	CISM 223	12	MCHE 322	16
CISM 123	6	CISM 224	12	CISM 323	24
MAYM 127	12	MAYM 227	16		
MCHE 121	12	MCHE 221	8		
PHYM 128	12	MCHE 223	8		
Total 2nd sem	66	Total 2nd sem	68	Total 2nd sem	56
Total year level 1	126	Total year level 2	136	Total year level	112
Total credits for the curriculum					374

11. Curriculum: BSc (Chemistry – Geography) N301M 200 150

Year level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr
GEOM 113	12	WVNS 211	12	GEOM 316	16
MCHE 114	12	GEOM 214	8	GEOM 317	16
MAYM 117	12	GEOM 215	8	MCHE 315	16
PHYM 118	12	MCHE 215	8	MCHE 316	16
AGLE 111	12	MCHE 216	8		
		EITHER PHYM 215	8		
		AND PHYM 216	8		
		OR MAYM 217	16		
Total 1st semester	60	Total 1st semester	60	Total 1st semester	64
Second semester		Second semester		Second semester	
Module code	Cr	Module code	Cr	Module code	Cr
GEOM 123	12	GEOM 224	8	GEOM 328	16
MCHE 121	12	GEOM 225	8	GEOM 329	16
MAYM 127	12	MCHE 221	8	MCHE 321	16
PHYM 128	12	MCHE 223	8	MCHE 322	16
AGLE 121	12	EITHER PHYM 221	8		
		AND PHYM 222	8		
		OR MAYM 227	16		
		WVNS 222	12		
Total 2nd semester	60	Total 2nd semester	60	Total 2nd semester	64
Total year level 1	120	Total year level 2	120	Total year level 3	128
Total credits for the curriculum					368

12. Curriculum: BSc (Chemistry – Mathematics) N 307M – 200 140

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	MAYM 317	16
MCHE 114	12	MCHE 215	8	MAYM 318	16
PHYM 118	12	MCHE 216	8	MCHE 315	16
MAYM 117	12	MAYM 217	16	MCHE 316	16
CISM 111	12	PHYM 215	8		
		PHYM 216	8		
Total 1st sem	60	Total 1st sem	60	Total 1st sem	64
Second semester		Second Semester		Second semester	
AGLE 121	12	WVNS 221	12	MAYM 327	16
MCHE 121	12	MCHE 221	8	MAYM 328	16
PHYM 128	12	MCHE 223	8	MCHE 321	16
MAYM 127	12	MAYM 227	16	MCHE 322	16
CISM 124	12	PHYM 221	8		
		PHYM 222	8		
Total 2nd sem	60	Total 2nd sem	60	Total 2nd sem	64
Total year level 1	120	Total year level 2	120	Total year level 3	128
Total credits for the curriculum					368

13. Curriculum: : BSc (Chemistry – Physics) N308M 200 129

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	PHYM 315	8
MCHE 114	12	MCHE 215	8	PHYM 316	8
PHYM 118	12	MCHE 216	8	PHYM 317	8
MAYM 117	12	MAYM 217	16	PHYM 318	8
CISM 111	12	PHYM 215	8	MCHE 315	16
		PHYM 216	8	MCHE 316	16
Total 1st sem	60	Total 1st sem	60	Total 1st sem	64
Second semester		Second Semester		Second semester	
AGLE 121	12	WVNS 221	12	PHYM 321	8
MCHE 121	12	MCHE 221	8	PHYM 322	8
PHYM 128	12	MCHE 223	8	PHYM 323	8
MAYM 127	12	MAYM 227	16	PHYM 324	8
CISM 124	12	PHYM 221	8	MCHE 321	16
		PHYM 222	8	MCHE 322	16
Total 2nd sem	60	Total 2nd sem	60	Total 2nd sem	64
Total year level 1	120	Total year level 2	120	Total year level 3	128
Total credits for the curriculum					368

14. Curriculum: BSc Computer Science - Electronics N 125M 200 177

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	CISM 311	24
CISM 111	12	CISM 211	12	ELYM 315	16
ELYM 115	12	CISM 212	12	ELYM 316	16
MAYM 117	12	ELYM 215	16		
PHYM 118	12	MAYM217	16		
SEM 1 TOTAL	60	SEM 1 TOTAL	68	SEM 1 TOTAL	56
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121	12	WVNS 221	12	CISM 323	24
CISM 122	12	CISM 223	12	ELYM 327	16
CISM 123	6	CISM 224	12	ELYM 328	16
ELYM 127	12	ELYM 227	16		
MAYM 127	12	MAYM 227	16		
PHYM 128	12				
Total semester 2nd	66	Total semester 2nd	68	Total semester 2nd	56
Total year level 1	126	Total year level 2	136	Total year level 3	112
Total credits for the curriculum					374

15. Curriculum: (Computer Science – Geography) N301M – 200 178

YEAR 1		YEAR 2		YEAR 3	
SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CREDIT	CODE	CREDIT	CODE	CREDIT
GEOM 113	12	GEOM 214	8	GEOM 316	16
CISM 111	12	GEOM 215	8	GEOM 317	16
MAYM 117	12	CISM 211	12	CISM 311	24
STFM 111	12	CISM 212	12		
AGLE 111	12	MAYM 217	16		
		WVNS 211	12		
SEM 1 TOTAL	60	SEM 1 TOTAL	68	SEM 1 TOTAL	56
SEMESTER 2		SEMESTER 2		SEMESTER 2	
GEOM 123	12	GEOM 224	8	GEOM 328	16
CISM 124	12	GEOM 225	8	GEOM 329	16
MAYM 127	12	CISM 223	12	CISM 323	24
STFM 121	12	CISM 224	12		
AGLE 121	12	MAYM 227	16		
		WVNS 222	12		
SEM 2 TOTAL	60	SEM 2 TOTAL	68	SEM 2 TOTAL	56
YEAR 2 TOTAL	120	YEAR 3 TOTAL	136	YEAR 4 TOTAL	112
CURRICULUM TOTAL =					368

16. Curriculum: BSc Computer Science - Mathematics N 127M 200 137

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	CISM 311	24
CISM 111	12	CISM 211	12	MAYM 317	16
PHYM 118	12	CISM 212	12	MAYM 318	16
MAYM 117	12	MAYM 217	16		
APMM 117	12	APMM 217	16		
SEM 1 TOTAL	60	SEM 1 TOTAL	68	SEM 1 TOTAL	56
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121	12	WVNS 221	12	CISM 323	24
CISM 122	12	CISM 223	12	MAYM 327	16
CISM 123	6	CISM 224	12	MAYM 328	16
MAYM 127	12	MAYM 227	16		
APMM 127	12	APMM 227	16		
PHYM 128	12				
Total semester 2nd	66	Total semester 2nd	68	Total semester 2nd	56
Total year level 1	126	Total year level 2	136	Total year level 3	112
Total credits for the curriculum					374

17. Curriculum: BSc (Computer Science – Physics) N 128M 200 132

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	CISM 311	24
CISM 111	12	CISM 211	12	PHYM 315	8
PHYM 118	12	CISM 212	12	PHYM 316	8
MAYM 117	12	PHYM 215	8	PHYM 317	8
MCHE 114	12	PHYM 216	8	PHYM 318	8
		MAYM 217	16		
SEM 1 TOTAL	60	SEM 1 TOTAL	68	SEM 1 TOTAL	56
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121	12	WVNS 221	12	CISM 323	24
CISM 122	12	CISM 223	12	PHYM 321	8
CISM 123	6	CISM 224	12	PHYM 322	8
PHYM 128	12	PHYM 221	8	PHYM 323	8
MAYM 127	12	PHYM 222	8	PHYM 324	8
MCHE 121	12	MAYM 227	16		
Total 2nd sem	66	Total 2nd sem	68	Total 2nd sem	56
Total year level 1	126	Total year level 2	136	Total year level 3	112
Total credits for the curriculum					374

18. Curriculum: BSc (Electronics – Mathematics) N309M 200 179

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	MAYM 317	16
ELYM 115	12	ELYM 215	16	MAYM 318	16
APMM 117	12	APMM 217	16	ELYM 315	16
MAYM 117	12	MAYM 217	16	ELYM 316	16
CISM 111	12				
Total semester 1st	60	Total semester 1st	60	Total Semester 1st	64
Second semester		Second Semester		Second semester	
AGLE 121	12	WVNS 221	12	MAYM 327	16
ELYM 127	12	ELYM 227	16	MAYM 328	16
APMM 127	12	APMM 227	16	ELYM 327	16
MAYM 127	12	MAYM 227	16	ELYM 328	16
CISM 124	12				
Total semester 2nd	60	Total semester 2nd	60	Total semester 2nd	64
Total year level 1	120	Total year level 2	120	Total year level 3	128
Total credits for the curriculum					368

19. Curriculum: BSc (Electronics – Physics) N310M – 200 180

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	PHYM 315	8
ELYM 115	12	ELYM 215	16	PHYM 316	8
PHYM 118	12	PHYM 215	8	PHYM 317	8
MAYM 117	12	PHYM 216	8	PHYM 318	8
CISM 111	12	MAYM 217	16	ELYM 315	16
				ELYM 316	16
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121	12	WVNS 221	12	PHYM 321	8
ELYM 127	12	ELYM 227	16	PHYM 322	8
PHYM 128	12	PHYM 221	8	PHYM 323	8
MAYM 127	12	PHYM 222	8	PHYM 324	8
CISM 124	12	MAYM 227	16	ELYM 327	16
				ELYM 328	16
Total semester 2nd	60	Total semester 2nd	60	Total semester 2nd	64
Total year level 1	120	Total year level 2	120	Total year level 3	128
Total credits for the curriculum					368

20. Curriculum: BSc (Mathematics – Physics) N311M 200 134

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	MAYM 317	16
ELYM 115	12	ELYM 215	16	MAYM 318	16
PHYM 118	12	PHYM 215	8	PHYM 315	8
MAYM 117	12	PHYM 216	8	PHYM 316	8
CISM 111	12	MAYM 217	16	PHYM 317	8
				PHYM 318	8
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121	12	WVNS 221	12	MAYM 327	16
ELYM 127	12	ELYM 227	16	MAYM 328	16
PHYM 128	12	PHYM 221	8	PHYM 321	8
MAYM 127	12	PHYM 222	8	PHYM 322	8
CISM 124	12	MAYM 227	16	PHYM 323	8
				PHYM 324	8
Total 2nd semester	60	Total 2nd semester	60	Total 2nd semester	64
Total year level 1	120	Total year level 2	120	Total year level 3	128
Total credits for the curriculum					368

21. Curriculum: BSc (Statistics - Mathematics) N 306M 200 138

Year level 1		Year level 2		Year 3	
First semester		First Semester		First Semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111	12	WVNS 211	12	MAYM 317	16
MAYM 117	12	MAYM 217	16	MAYM 318	16
STFM 111	12	STFM 211	8	STFM 311	16
APMM 117	12	STFM 212	8	STFM 312	16
CISM 111	12	APMM 217	16		
Total 1st semester	60	Total 1st semester	60	Total 1st Semester	64
Second semester		Second Semester		Second semester	
AGLE 121	12	WVNS 221	12	MAYM 327	16
MAYM 127	12	MAYM 227	16	MAYM 328	16
STFM 121	12	STFM 221	8	STFM 321	16
APMM 127	12	STFM 222	8	STFM 322	16
CISM 124	12	APMM 227	16		
Total 2nd semester	60	Total 2nd semester	60	Total 2nd semester	64
Total year level 1	120	Total year level 2	120	Total year level 3	128
Total credits for the curriculum					368

MA.2 Module outcomes

MA.2.1 DIPLOMA in ANIMAL HEALTH

OLD CODES AHD132, AHDM112 NEW CODE AHVM111	CREDITS 12	SEMESTER 1
Title: Anatomy and Physiology: Animal health 1		
Module outcomes: Students should be able to describe the basic organization of living organisms with respect to the cell, tissues, and organ systems. Describe the basic anatomy and physiology of domestic animals including birds, with respect to the integumentary, musculo-skeletal, nervous, and endocrine systems. In practical sessions there are demonstrations by lecturer and dissections by students of systems, organs and tissues studied in the theory.		
OLD CODES AHD152, AHDM122 NEW CODE AHVM122	CREDITS 12	SEMESTER 2
Title: Anatomy and Physiology: Animal Health II		
Module outcomes: Students should be able to describe the anatomy and physiology of domestic animals including birds with respect to the respiratory, circulatory, gastrointestinal, urinary, and reproductive systems. In practical sessions there are demonstrations by lecturer and dissections by students of systems, organs and tissues studied in the theory.		
CODE AHVM112	CREDITS 8	SEMESTER 1
Title: Animal Handling and Equipments I		
Module outcomes: Students should be able to perform basic animal handling techniques and farm procedures. Name and describe the commonly used veterinary instruments and equipments. In practical sessions students practice under the supervision of veterinarians and animal health technicians, procedures related to the theory topics above. Video tapes may be used to supplement the students practical learning.		
CODE AHVM123	CREDITS 8	SEMESTER 2
Title: Animal Handling and Equipments II		
Module outcomes: Students should be able to increase their proficiency and perform additional basic animal handling techniques and routine farm procedures and revise previous skills. Name and describe additional commonly used veterinary instruments and equipments. In practical sessions students will practice and increase their proficiency under the supervision of veterinarians and animal health technicians, procedures related to the theory topics above. Video tapes may be used to supplement the students practical learning.		
OLD CODES AHD122, AHDM211 NEW CODE AHVM121	CREDITS 12	SEMESTER 2
Title: Basic Microbiology 1 for Animal Health		
Module outcomes: Students should be able to give a basic description of the classes of microorganisms of veterinary importance (bacteria, viruses, fungi, rickettsia and protozoans etc). Give a general grouping of bacteria and fungi of veterinary importance according to staining results, morphology and characteristics. Give a basic description of the general principles of pathogenesis by microbiological agents. Describe the commonly encountered animal health infections: causative agents, transmission, prevention of transmission, human health implications. In practical sessions learners will participate in the use of general laboratory procedures in microbiology including but not limited to staining and viewing of bacteria under the microscope, culturing of bacteria, use of different media, sensitivity testing, etc. especially as related to animal diseases. Case studies may also be used. Use of practical microbiological procedures to help differentiate common microbiological pathogens.		

CODE AHVM226	CREDITS 16	SEMESTER 2
Title: Basic Microbiology for 11 for Animal Health		
Module outcomes: Students should be able to give a functional description of the classes of microorganisms of animal health importance (bacteria, viruses, fungi, rickettsia and protozoans etc). Give a functional description of the general principles of pathogenesis by microbiological agents. Give a general grouping of bacteria and fungi of animal health importance according to staining results, morphology and characteristics. Describe microbes causing important diseases of animals. Describe the commonly encountered animal health infections: causative agents, transmission, prevention of transmission, human health implications. In practical sessions learners will participate in the use of general laboratory procedures in microbiology including but not limited to staining and viewing of bacteria under the microscope, culturing of bacteria, use of different media, sensitivity testing, etc. especially as related to animal diseases. Case studies may also be used. Use of practical microbiological procedures to help differentiate common microbiological pathogens.		
CODE AHVM211	CREDITS 16	SEMESTER 1
Title: Diseases I		
Module outcomes: Students should be able to describe the basic concepts of the commonly occurring viral and bacterial diseases in respect to epidemiology, clinical signs, postmortem, diagnostic methods, treatment, and preventative measures with emphasis on the notifiable diseases. Evaluate lists of differential diagnoses and come up with tentative diagnosis. In practical sessions students will be involved in assisting the veterinarian in the examination, diagnosis and treatment as well as prevention of the diseases studied in the theory. When specific disease conditions are not seen in the live animals, video tapes will be used to supplement the student practical learning. Students will be guided in the use of epidemiological surveys and investigations including the collection and recording of data related to the diseases studied.		
CODE AHVM221	CREDITS 16	SEMESTER 2
Title: Diseases II		
Module outcomes: Students should be able to describe the basic concepts of the common protozoal, rickettsial, fungal and non-infectious conditions regarding epidemiology, clinical signs, postmortem, diagnostic methods, treatment, and preventative measures. Evaluate lists of differential diagnoses and come up with tentative diagnosis. In practical sessions students will be involved in assisting the veterinarian in the examination, diagnosis and treatment as well as prevention of the diseases studied in the theory. When specific disease conditions are not seen in the live animals, video tapes will be used to supplement the student practical learning. Students will be guided in the use of epidemiological surveys and investigations including the collection and recording of data related to the diseases studied.		
OLD CODES AHD253, AHDM223 NEW CODE AHVM212	CREDITS 8	SEMESTER 1
Title: Parasitology for Animal Health		
Module outcomes: Students should be able to describe the basic aspects of the commonly encountered external parasites. Describe the basic aspects of the commonly encountered internal parasites. Practicals: Demonstration and identification of internal parasites studied in the theory, faecal analysis for internal parasites, identification of worm eggs, treatment for internal parasites using both oral medication and injectable medication. Demonstration and identification of external parasites studied in the theory including ticks, tick counts, mites, lice, dipping for external parasites, table inspection, identification of the sheep scab mite, treatment for external parasites.		

OLD CODES AHD192, AHDM125 NEW CODE AHVM222	CREDITS 16	SEMESTER 2
Title: Obstetrics and Genital Diseases: Animal Health		
Module outcomes: Students should be able to describe the basic concepts of the reproductive cycles of domestic animals, and the factors which influence them. Describe the diseases and conditions causing infertility in production and companion animals and know how to prevent them. Describe the basic physiology of gestation and parturition, and its related problems. In practical sessions learners assist the veterinarian with clinical cases involving obstetrical procedures for relieving dystocia, treatments associated with dystocia, assisting with dystocia, retained placentas, fertility examinations, semen evaluations, sheath washes, and other clinical cases related to obstetrics and reproductive diseases.		
CODE AHVM223	CREDITS 16	SEMESTER 2
Title: Pharmacology and Toxicology: Animal Health		
Module outcomes: Students should be able to explain the basic pharmacokinetic and toxicokinetic concepts of medicines, toxic plants and common poisons. Explain the basic modes of action of the toxins and medicines, and relate them to the respective clinical signs. Explain the basic diagnostic methods and treatments in cases of poisoning. Assist the veterinarian in the treatment of sick animals using the various medications, as well as in the treatment of common intoxications. In practical sessions learners use different routes of administration of medication including subcutaneous, intramuscular, intravenous, intraperitoneal, epidural, intramammary, subconjunctival, topical and oral. Restraint and the assistance of the veterinarian in drug administration. Identification of common toxic plants, poisons, heavy metals, organophosphates, rodenticides and others.		
OLD CODES AHD 202, AHAD213 NEW CODE AHVM224	CREDITS 8	SEMESTER 2
Title: Public Health for Animal Health		
Module outcomes: Students should be able to describe the general measures that ensure that water and food of animal origin is free from pathogens and toxins. Advise farmers on concepts of safe and hygienic food production. Demonstrate functional knowledge of the relevant national and international legislation regarding the management of food-borne and zoonotic diseases. Describe the gross anatomy of a slaughter carcass. Describe the abattoir slaughter procedures. Describe the abattoir hygiene processes. Describe the basic procedure of meat inspection in an abattoir. Describe the statutory requirements and obligations of animals health technicians in terms of the relevant acts. Describe the general life cycles, epidemiologies, treatment and control measures of the common zoonoses, as learnt from Diseases modules, including but not limited to rabies, anthrax, brucellosis, Rift Valley fever, tapeworms and hookworms. In practical sessions students visits all categories and grades of abattoirs in and around the province. Visits to dairies, dairy processing plants. Interaction with public health officials, meat and dairy inspectors and others involved in regulatory public health services.		
OLD CODES AHAD 372, AHDM323 NEW CODE AHVM225	CREDITS 8	SEMESTER 2
Title: Clinical Laboratory Techniques		
Module outcomes: Students should be able to explain the basic laboratory techniques. Demonstrate the basic theoretical and practical clinical pathology skills. In practical sessions students do blood smear preparation and evaluation, faecal flotation preparation and evaluation, haematocrit preparation and evaluation. Urine samples evaluation, sediment staining and evaluation, bacteria cultures and sensitivity testing, media preparation, specimen preservation and storage. Milk testing, somatic cell counts, rumen fluid evaluation, skin scrapings for all species, clinical chemistry. Students will practice in the lab the procedures studied in the		

theory of the various courses. Practice of collection, preservation and preparation of samples for dispatch to the various kinds of laboratories.		
OLD CODES AHAD 302, AHAM411 NEW CODE AHVM311	CREDITS 16	SEMESTER 1
Title: Companion Animal Medicine & Surgery I		
Module outcomes Students should be able to perform first aid procedures on companion animals prior to attendance by a veterinarian. Perform primary health care procedures on companion animals. Communicate preventative methods to clients. Assist veterinarians in surgery, diagnostics, and treatments. In practical sessions vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.		
OLD CODES AHD 352, AHAM421 NEW CODE AHVM321	CREDITS 16	SEMESTER 2
Title: Companion Animal Medicine & Surgery II		
Module outcomes: Students should be able to perform further first aid procedures on companion animals prior to attendance by a veterinarian. Perform further primary health care procedures on companion animals. Communicate preventative methods to clients. Assist veterinarians in surgery, diagnostics, and treatments. The following procedures are done during practical sessions, vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.		
OLD CODES AHD 332, AHDM314 NEW CODE AHVM312	CREDITS 16	SEMESTER 1
Title: Production Animal Medicine & Surgery I		
Module outcomes: Students should be able to perform first aid procedures on production animal prior to attendance by a veterinarian. Perform primary health care procedures on production animals. Communicate preventative methods to clients. Assist veterinarians in surgery, diagnostics, and treatments. The following procedures are done during practical sessions, vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.		
OLD CODES AHAD 382, AHDM324 NEW CODE AHVM322	CREDITS 16	SEMESTER 2
Title: Production Animal Medicine & Surgery II		

Module outcomes:		
<p>Students should be able to perform further fundamental first aid procedures on production animals prior to attendance by a veterinarian. Perform further primary health care procedures on production animals. Communicate fundamental preventative methods to clients. Assist veterinarians in surgery, diagnostics, and treatments. In practical session the following is observed, vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.</p>		
OLD CODES AHAD 322, AHDM313 NEW CODE AHVM313	CREDITS 8	SEMESTER 1
Title: Pathology I		
Module outcomes:		
<p>Students should be able to explain the common concepts of clinical pathology. Differentiate between the general normal and abnormal organ structures during postmortem procedures, and also be able to collect and dispatch specimens, in addition to proper disposal and disinfection of carcasses and pollution sites respectively. Explain the general anatomical and functional structures of the body and the associated pathology. In practical sessions the following are observed, Functional osteology, teeth and ageing, applied anatomy of the head, practical anatomy and gross pathology of the respiratory and circulatory systems, lymphoid tissues, pathology of the central nervous system and vertebral column. Gross pathology of the gastrointestinal tract and related abdominal organs, clinical anatomy of the hoof, functional anatomy and gross pathology of the male and female genital tracts. Palpation and/or observation where applicable on the live animal of the systems and organs, and gross pathology of the various systems, organs and tissues during post mortem examinations. Specimen collection, storage and dispatch. Carcass disposal. Clinical pathology procedures, and results interpretation. Safety and occupational health procedures.</p>		
CODE AHVM323	CREDITS 8	SEMESTER 2
Title: Pathology II		
Module outcomes:		
<p>Students should be able to explain further common concepts of clinical pathology. Increase their proficiency in explaining the elementary anatomical and functional structures of the body and the associated pathology. Differentiate between the normal and abnormal organ structures during postmortem procedures, and also be able to collect and dispatch specimens, in addition to proper disposal and disinfection of carcasses and pollution sites. Practicals; Post mortem procedures, specimen collection, storage and dispatch. Carcass disposal. Clinical pathology procedures, and results interpretation. Safety and occupational health procedures.</p>		
CODE AHVM 314	CREDITS 8	SEMESTER 1
Title: Epidemiology and Jurisprudence		
Module outcomes:		
<p>Students should be able to explain the importance of epidemiology in disease surveillance, prevention and control. Explain and demonstrate the basic epidemiological concepts as they relate to disease surveillance, prevention and control. Describe the laws that pertain to veterinary practice. The following topics are covered, Importance of epidemiology, basic introduction to experimental trials, sampling methods, sample sizes and hypothesis testing, disease surveillance, disease incidence rates, prevalence rates, sensitivity and/or specificity of diagnostic tests, disease control. Laws regulating animal diseases, regulatory bodies. The application and administration of national and international animal disease control measures</p>		

and the use of epidemiological surveys and investigations. Vaccination programmes. Practicals will involve students practising relevant aspects of what they covered during theory classes as stipulated above. Video and other teaching aids may be used to supplement the students practical learning.

OLD CODES AHD 342, AHDM315 NEW CODE AHVM315	CREDITS 8	SEMESTER 1
Title: Practical Experiential Learning I		
Module outcomes: Students should be able to relate what they learnt during the entire curriculum with the actual field situations under supervision of professionals in various fields of animal health and production. Modalities; students will be required to spend 2 weeks in the field (outside the University) in an approved laboratory, registered veterinary clinic, state veterinary office, wildlife park and other such stations under the supervision of qualified veterinarians, game rangers or game veterinarian. The period will fall during the vacation. Students will also work at the University farm under the supervision of the farm sectional managers, the farm manager and animal health staff members at prescribed times during the semester. One of the two sessions (between PRACTICAL EXPERIENTIAL LEARNING I and II should be conducted under a veterinarian or an animal health technician working first hand with treatment and control of animal diseases.		
CODE AHVM 325	CREDITS 8	SEMESTER 2
Title: Practical Experiential Learning II		
Module outcomes: Students should be able to further relate what they learnt during the entire curriculum with the actual field situations under supervision of professionals in various fields of animal health and production. Modalities students will be required to spend 2 weeks in the field (outside the University) in an approved laboratory, registered veterinary clinic, state veterinary office, wildlife park and other such stations under the supervision of qualified veterinarians, game rangers or game veterinarian. The period will fall during the vacation. Students will also work at the University farm under the supervision of the farm sectional managers, the farm manager and animal health staff members at prescribed times during the semester. One of the two sessions (between PRACTICAL EXPERIENTIAL LEARNING I and II should be conducted under a veterinarian or an animal health technician working first hand with treatment and control of animal diseases.		
CODE AHVM324	CREDITS 8	SEMESTER 2
Title: Scheduled Diseases		
Modules outcomes: Students should be able to describe and perform procedures relating to the Tuberculosis (TB) and Contagious Abortion (CA) eradication schemes as prescribed by the National Department of Agriculture. Describe the general concepts of Scheduled Diseases and current disease outbreaks. In practical sessions, Prescribed field tests, sampling procedures using relevant materials and equipments and interpretation of results. Video shows of current disease outbreaks may be used.		

MA.2.2 BSC AGRIC - ANIMAL HEALTH

OLD CODES AHA 222, AHAM211 NEW CODE AHPM211	CREDITS 16	SEMESTER 1
Title: Microbiology for Animal Health		
Module outcomes: Students should be able to describe the classes of microorganisms of veterinary importance (bacteria, viruses, fungi, rickettsia and protozoans etc). Group bacteria and fungi of veterinary importance according to staining results, morphology and characteristics Describe the general principles of pathogenesis by microbiological agents. Describe the commonly encountered animal health infections: causative agents, transmission, prevention of transmission, human health implications. In practical sessions Learners will participate in the use of general laboratory procedures in microbiology including but not limited to staining and viewing of bacteria under the microscope, culturing of bacteria, use of different media, sensitivity testing, etc. especially as related to animal diseases. Case studies may also be used. Use of practical microbiological procedures to help differentiate common microbiological pathogens.		
OLD CODES AHA 132, AHAM112 NEW CODE AHPM212	CREDITS 16	SEMESTER 1
Title: Anatomy and Physiology: Animal Health 1		
Module outcomes: Students should be able to describe the organization of living organisms with respect to the cell, tissues, and organ systems. Describe the anatomy and physiology of domestic animals including birds, with respect to the integumentary, musculo-skeletal, nervous, and endocrine systems. Practical; Demonstrations by lecturer and dissections by students of systems, organs and tissues studied in the theory.		
OLD CODES AHA 152, AHAM122 NEW CODE AHPM221	CREDITS 8	SEMESTER 2
Title: Anatomy and Physiology: Animal Health 11		
Module outcomes: Students should be able to describe the anatomy and physiology of domestic animals including birds, with respect to the respiratory, circulatory, gastrointestinal, urinary, and reproductive systems. Practical; Demonstrations by lecturer and dissections by students of systems, organs and tissues studied in the theory.		
CODE AHPM222	CREDITS 8	SEMESTER 2
Title: Animal Handling and Equipments I		
Module outcomes: Students should be able to perform animal handling techniques and selected basic farm procedures. Name and describe commonly used veterinary instruments and equipments. Practicals will involve students practising, under the supervision of veterinarians and animal health technicians, procedures related to the theory topics above. Video tapes may be used to supplement the students practical learning.		
CODE AHPM314	CREDITS 8	SEMESTER 1
Title: Animal Handling and Equipments II		
Module outcomes: Students should be able to increase their proficiency, and perform additional animal handling techniques and routine farm procedures. Name and describe additional commonly used veterinary instruments and equipments. The following topics are covered, Castration, dehorning, hoof trimming, relieving choke, trocar and canular use, feet examination, tomach tubing, aging using teeth, rectal palpation. Names, description, and use of common veterinary instruments. Practicals will involve students practising and increasing their proficiency, under the supervision of veterinarians and animal health technicians, procedures related to the theory topics above. Video tapes may be used to supplement the students practical learning.		

CODE AHPM311	CREDITS 16	SEMESTER 1
Title: Diseases I		
Module outcomes: Students should be able to describe the fundamental concepts of the common viral and bacterial diseases in respect to epidemiology, clinical signs, postmortem, diagnostic methods, treatment, and preventative measures with emphasis on the notifiable diseases. Evaluate lists of differential diagnosis and come up with a tentative diagnosis. Apply national and international disease control measures in terms of existing legislation. Most of the practicals will involve the students in assisting the veterinarian in the examination, diagnosis, and treatment as well as prevention of the diseases studied in the theory. When specific disease conditions are not seen in the live animals, video tapes will be used to supplement the students practical learning. Students will be guided in the use of epidemiological surveys and investigations including the collection and recording of data related to the diseases studied.		
CODE AHPM321	CREDITS 16	SEMESTER 2
Title: Diseases II		
Module outcomes: Students should be able to describe the fundamental concepts of the common protozoal, rickettsial, fungal and non-infectious conditions regarding epidemiology, clinical signs, postmortem, diagnostic methods, treatment, and preventative measures. Evaluate lists of differential diagnoses and come up with tentative diagnosis. Apply national and international disease control measures in terms of existing legislation. Most of the practicals will involve the students in assisting the veterinarian in the examination, diagnosis, and treatment as well as prevention of the diseases studied in the theory. When specific disease conditions are not seen in the live animals, video tapes will be used to supplement the students practical learning. Students will be guided in the use of epidemiological surveys and investigations including the collection and recording of data related to the diseases studied.		
CODE AHPM 312	CREDITS 8	SEMESTER 1
Title: Epidemiology and Jurisprudence		
Module outcomes: Students should be able to explain the importance of epidemiology in disease surveillance, prevention and control. Explain and demonstrate epidemiologic concepts as they relate to disease surveillance, prevention and control. Describe the laws that pertain to veterinary practice. Practical will involve students practising relevant aspects of what they covered during theory classes as stipulated above. Video and other teaching aids may be used to supplement the students practical learning.		
OLD CODES AHA 292, AHAM225 NEW CODE AHPM313	CREDITS 16	SEMESTER 1
Title: Obstetrics and Genital Diseases: Animal Health		
Module outcomes: Students should be able to describe the fundamental concepts of the reproductive cycles of domestic animals, and the factors which influence them. Describe the diseases and conditions causing infertility in production and companion animals and know how to prevent them. Describe the physiology of gestation and parturition, and its related problems. Practical will involve assisting the veterinarian with clinical cases involving obstetrical procedures for relieving dystocia, treatments associated with dystocia, assisting with dystocia, retained placentas, fertility examinations, semen evaluations, sheath washes, and other clinical cases related to obstetrics and reproductive diseases.		
OLD CODES AHA 353, AHAM233 NEW CODE AHPM322	CREDITS 16	SEMESTER 2
Title: Parasitology: Animal Health		
Module outcomes: Students should be able to describe fundamental aspects of the commonly encountered external parasites. Describe fundamental aspects of the commonly encountered internal		

parasites. Identify selected external and internal parasites. Prepare fecal flotations for internal parasites. Identify internal parasite ova under the microscope. Assist the veterinarian in the control, prevention and treatment of veterinary internal and external parasites. Practicals will involve demonstration and identification of internal parasites studied in the theory, faecal analysis for internal parasites, identification of worm eggs, treatment for internal parasites using both oral medication and injectable medication. Demonstration and identification of external parasites studied in the theory including ticks, tick counts, mites, lice, dipping for external parasites, table inspection, identification of the sheep scab mite, treatment for external parasites.

CODE AHPM323

CREDITS 16

SEMESTER 2

Title: **Pharmacology and Toxicology: Animal Health**

Module outcomes:

Students should be able to explain the fundamental pharmacokinetic and toxicokinetic concepts of common medicines, toxic plants and poisons. Explain the general modes of action of common medicines, toxic plants, poisons and relate them to the respective effects and clinical signs. Explain the basic diagnostic methods and treatments in cases of poisoning. Assist the veterinarian in the treatment of sick animals using the various medications, as well as in the treatment of common intoxications. Practicals will involve use of the different routes of administration of medication including subcutaneous, intramuscular, intravenous, intraperitoneal, epidural, intramammary, subconjunctival, topical and oral. Restraint and the assistance of the veterinarian in drug administration. Identification of common toxic plants, poisons, heavy metals, organophosphates, rodenticides and others

**OLD CODES AHA 202, AHAM213
NEW CODE AHPM324**

CREDITS 8

SEMESTER 2

Title: **Public Health for Animal Health**

Module outcomes:

Students should be able to describe the measures that ensure that water and food of animal origin is free from pathogens and toxins. Advise farmers on concepts of safe and hygienic food production. Demonstrate knowledge of the relevant national and international legislation regarding the management of food-borne and zoonotic diseases. Describe the gross anatomy of a slaughter carcass. Describe the abattoir slaughter procedures. Describe the abattoir hygiene processes. Describe the basic procedure of meat inspection in an abattoir. Describe the statutory requirements and obligations of animals health technicians in terms of the relevant acts. Describe the life cycles, epidemiologies, treatment and control measures of the common zoonoses, as learnt from Diseases modules, including but not limited to rabies, anthrax, brucellosis, Rift Valley fever, tapeworms and hookworms. In practical sessions there shall be visits to all categories and grades of abattoirs in and around the province. Visits to dairies, dairy processing plants. Interaction with public health officials, meat and dairy inspectors, and others involved in regulatory public health services.

**OLD CODES AHA 472, AHAM423
NEW CODE AHPM 325**

CREDITS 8

SEMESTER 2

Title: **Clinical Laboratory Techniques**

Module outcomes:

Students should be able to describe the fundamental laboratory techniques. Demonstrate the general theoretical and practical clinical pathology skills. Practicals will involve blood smear preparation and evaluation, faecal flotation preparation and evaluation, haematocrit preparation and evaluation. Urine samples evaluation, sediment staining and evaluation, bacteria cultures and sensitivity testing, media preparation, specimen preservation and storage. Milk testing, somatic cell counts, rumen fluid evaluation, skin scrapings for all species, clinical chemistry. Students will practice in the lab the procedures studied in the theory of the various courses. Practice of collection, preservation and preparation of samples for dispatch to the various kinds of laboratories.

CODE AHPM326	CREDITS 8	SEMESTER 2
Title: Livestock Diseases		
Module outcomes: Students should be able to define the common terms used to describe diseases and conditions in farm animals. Describe the fundamental concepts of diseases in farm animals. Discuss the main bacterial, viral, rickettsial, and protozoal infections of farm animals. Describe the influence of nutrition, genetics, and environment on disease occurrence. Describe the important toxic principles and metabolic diseases of farm animals. Most of the practicals will involve the students in assisting the veterinarian in the examination, diagnosis, and treatment as well as prevention of the diseases studied in the theory. When specific disease conditions are not seen in the live animals, video tapes will be used to supplement the students practical learning. Students will be guided in the use of epidemiological surveys and investigations including the collection and recording of data related to the diseases studied.		
OLD CODES AHA 402, AHAM411 NEW CODE AHPM411	CREDITS 16	SEMESTER 1
Title: Companion Animal Medicine & Surgery I		
Module outcomes: Students should be able to perform emergency procedures on companion animals prior to attendance by a veterinarian. Perform primary health care procedures on companion animals. Communicate preventative and control methods to clients. Assist veterinarians during surgery, diagnostics, and treatment of animals. In practical sessions learners do the following; vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.		
OLD CODES AHA 452, AHAM421 NEW CODE AHPM421	CREDITS 16	SEMESTER 2
Title: Companion Animal Medicine & Surgery II		
Module outcomes: Students should be able to perform further emergency procedures on companion animals prior to attendance by a veterinarian. Perform further primary health care procedures on companion animals. Communicate preventative and control methods to clients. Assist veterinarians during surgery, diagnostics, and treatments. In practical sessions learners do the following; vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.		
OLD CODES AHA 432, AHAM414 NEW CODE AHPM412	CREDITS 16	SEMESTER 1
Title: Production Animal Medicine & Surgery I		
Module outcomes: Students should be able to perform fundamental emergency procedures on production animals prior to attendance by a veterinarian. Perform primary health care procedures on		

production animals. Communicate preventative and control methods to clients. Assist veterinarians during surgery, diagnostics, and treatment of animals. In practical sessions learners do the following; vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.

**OLD CODES AHA 482, AHAM424
NEW CODE AHPM422**

CREDITS 16

SEMESTER 2

Title: **Production Animal Medicine & Surgery II**

Module outcomes:

Students should be able to perform further emergency procedures on production animals prior to attendance by a veterinarian. Perform further primary health care procedures on production animals. Communicate preventative and control methods to clients. Assist veterinarians during surgery, diagnostics, and treatments. In practical sessions learners do the following; vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.

**OLD CODES AHA 422, AHAM413
NEW CODE AHPM413**

CREDITS 8

SEMESTER 1

Title: **Pathology I**

Module outcomes:

Students should be able to explain the fundamental concepts of clinical pathology. Differentiate between the general normal and abnormal organ structures during postmortem procedures, and also be able to collect and dispatch specimens, in addition to proper disposal and disinfection of carcasses and pollution sites. Explain the general anatomical and functional structures of the body and the associated pathology. In practical sessions learners will observe the following, Functional osteology, teeth and ageing, applied anatomy of the head, practical anatomy and gross pathology of the respiratory and circulatory systems, lymphoid tissues, pathology of the central nervous system and vertebral column. Gross pathology of the gastrointestinal tract and related abdominal organs, clinical anatomy of the hoof, functional anatomy and gross pathology of the male and female genital tracts. Palpation and/or observation where applicable on the live animal of the systems and organs, and gross pathology of the various systems, organs and tissues during post mortem examinations. Specimen collection, storage and dispatch. Carcass disposal. Clinical pathology procedures, and results interpretation. Safety and occupational health procedures.

CODE AHPM423

CREDITS 8

SEMESTER 2

Title: **Pathology II**

Module outcomes:

Students should be able to explain additional fundamental concepts of clinical pathology. Perform additional postmortem procedures, and also be able to collect and dispatch specimens, together with the proper disposal and disinfection of carcasses and pollution sites. In practical sessions students perform the following, post mortem procedures, specimen collection, storage and dispatch. Carcass disposal. Clinical pathology procedures, and results interpretation. Safety and occupational health procedures.

OLD CODES AHA 442, AHAM415 NEW CODE AHPM414	CREDITS 8	SEMESTER 1
Title: Practical Experiential Learning I		
Module outcomes: Students should be able to relate what they learnt during the entire degree curriculum with the actual field situations under supervision of professionals in various fields of animal health and production. Modalities; students will be required to spend 2 weeks in the field (outside the University) in an approved laboratory, registered veterinary clinic, state veterinary office, wildlife park and other such stations under the supervision of qualified veterinarians, game rangers or game veterinarian. The period will fall during the vacation. Students will also work at the University farm under the supervision of the farm sectional managers, the farm manager and animal health staff members at prescribed times during the semester. One of the two sessions (between PRACTICAL EXPERIENTIAL LEARNING I and II should be conducted under a veterinarian or an animal health technician working first hand with treatment and control of animal diseases.		
CODE AHPM424	CREDITS 8	SEMESTER 2
Title: Practical Experiential Learning II		
Module outcomes: Students should be able to further relate what they learnt during the entire degree curriculum with the actual field situations under supervision of professionals in various fields of animal health and production. Modalities; students will be required to spend 2 weeks in the field (outside the University) in an approved laboratory, registered veterinary clinic, state veterinary office, wildlife park and other such stations under the supervision of qualified veterinarians, game rangers or game veterinarian. The period will fall during the vacation. Students will also work at the University farm under the supervision of the farm sectional managers, the farm manager and animal health staff members at prescribed times during the semester. One of the two sessions (between PRACTICAL EXPERIENTIAL LEARNING I and II should be conducted under a veterinarian or an animal health technician working first hand with treatment and control of animal diseases.		
CODE AHPM415	CREDITS 16	SEMESTER 1
Title: Research Project And Seminar I		
Module outcomes: Students should be able to explain the fundamental concepts of projects planning, research methodologies, produce a literature review and present project proposals. Evaluate scientific literature.		
CODE AHPM425	CREDITS 16	SEMESTER 2
Title: Research Project And Seminar II		
Module outcomes: Students should be able to produce a written mini-dissertation from their research projects. Present their mini-dissertations orally		
CODE AHPM426	CREDITS 8	SEMESTER 2
Title: Scheduled Diseases		
Module outcomes: Students should be able to describe and perform procedures relating to the Tuberculosis (TB) and Contagious Abortion (CA) eradication schemes as prescribed by the National Department of Agriculture. Describe the general concepts of Scheduled Diseases and current disease outbreaks. Practical; prescribed field tests, sampling procedures using relevant materials and equipments and interpretation of results. Video shows of current disease outbreaks may be used.		

MA.2.3 DIPLOMA in AGRIC ANIMAL SCIENCE

Module code: ANDM 121	Semester 2	
Title: Introduction to Animal Science		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the South African animal science industry overview. Explain the role of animal science to economic and human development. Classify farm animals based on climate, size, gastro-intestinal tract, feeding behaviour and production. Differentiate between breeds of farm animals. Discuss location of animals to different geographical areas based on their adaptability. Explain the basic introductory principles of the physiology of growth and development, reproduction, breeding, nutrition and health of farm animals.		
Module code: ANDM 122	Semester 2	
Title: Non – Ruminant Production		
Module outcomes: Upon completion of this module, the learner(s) should be able to demonstrate an understanding of the poultry and pig industry, poultry and pig breeds and their contribution to animal agriculture. Propose strategies on improvement of poultry production system and appropriate breeds. Develop a comprehensive plan of a poultry production unit health programme. Apply modern management techniques in efficient feeding and rearing of broilers and layers. Evaluate and provide recommendation on monogastric products and their quality and their marketing strategies.		
Module code: ANDM 211	Semester 1	
Title: Animal Nutrition		
Module outcomes: Upon completion of this module, the learner(s) should be able to compare the roles and functions of different nutrients found in animal feed and explain the importance of animal nutrition. Discuss the role played by nutrients in the health of animals and digestion in ruminants and non-ruminants. Describe the requirements of nutrients for growth, maintenance, reproduction and production. Identify and classify South African feedstuffs based on their nutritive value. Formulate rations for farm animals and justify the need for evaluating feeds .		
Module code: ANDM 212	Semester 1	
Title: Animal Genetics and Breeding		
Module outcomes: Upon completion of this module, the learner(s) should be able to outline the possible deviations from the expected Mendelian ratios and provide comprehensive explanations for them. Utilize the concept of sex linkage in farming situations. Describe mutations as a source of genetic variation in living organisms. Predict genetic change and describe different selection methods and mating system. Evaluate the importance of cell division in living organisms.		
Module code: ANDM 213	Semester 1	
Title: Ruminant Production		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the South African ruminant industry overview and the economic importance of the ruminant industry in human and economic development. Identify and describe the physical and production characteristics of different breeds of sheep, goats, beef and dairy cattle. Locate different breeds of sheep, goats, beef and dairy cattle to various livestock production systems and climatic conditions. Apply management principles such as rearing systems (calves/lambs/kids), breeding and selection, reproduction and feeding (nutrition) in various ruminant production systems.		

Module code: ANDM 221	Semester 1	
Title: Smallstock Production and Management		
Module outcomes:		
<p>Upon completion of this module, the learner(s) should be able to describe the South African smallstock industry overview and the economic importance of the smallstock industry in human and economic development. Identify and describe the physical and production characteristics of different breeds of sheep and goats. Locate different breeds of sheep and goats, to various livestock production systems and climatic conditions. Apply management principles such as rearing systems (lambs/kids), breeding and selection, reproduction and feeding (nutrition) in smallstock production systems. Develop and evaluate breeding, nutrition, reproduction and health programmes in smallstock.</p>		
Module code: ANDM 223	Semester 2	
Title: Beef Cattle Production and Management		
Module outcomes:		
<p>Upon completion of this module, the learner(s) should be able to recognise the beef cattle industry in South Africa as integrated industry from farm to market place. Characterise beef cattle breeds and their crosses according their biological types and adaptability to specific environments. Develop suitable beef cattle production systems to meet the objective of different farmers. Plan, monitor and critically evaluate, breeding, reproductive, nutritional and health programmes. Manage beef cattle enterprises according to their production systems.</p>		
Module code: ANDM 225	Semester 2	
Title: Principles of Veld Management		
Module outcomes:		
<p>Upon completion of this module, the learner(s) should be able to explain the basic principles governing the vegetation development. Justify the need for the practical application of principles in each of the six biome types. Compare and contrast the factors associated with forage quality and how they influences animal performance. Describe the problems of increasing bush encroachment in savanna, with proposals on how to deal with the problem. Discuss the approach to and theoretical basis of veld management on the game ranch. Summarise the management of veld in the communal areas of South Africa.</p>		
Module code: ANDM 312	Semester 1	
Title: Poultry Production and Management		
Module outcomes:		
<p>Upon completion of this module, the learner(s) should be able to demonstrate an understanding of the poultry breeds and their characteristics. Evaluate and provide recommendation on poultry egg and meat quality. Propose strategies on improvement of poultry production systems. Apply modern management techniques in efficient feeding and rearing of broilers and layers. Develop a poultry production unit health programme.</p>		
Module code: ANDM 313	Semester 1	
Title: Dairy Cattle Production and Management		
Module outcomes:		
<p>Upon completion of this module, the learner(s) should be able to identify dairy cattle breeds, their production characteristics and their economic importance to the South African dairy industry. Integrate dairy cattle breeding, feeding and reproduction for total management of the dairy cattle enterprise. Plan and implement management practices in dairy cattle herds. Formulate, keep and use dairy cattle records system (production and financial). Develop, implement and manage health programmes in dairy herds for prevention and the diagnoses of various diseases for assurance of dairy cattle health.</p>		
Module code: ANDM 314	Semester 1	
Title: Pig production and Management		

Module outcomes:		
Upon completion of this module, the learner(s) should be able to differentiate and characterize breeds of pigs and their potential contribution to the Pork Industry in South Africa. Integrate pig production systems with components of pork quality and major aspects of producer to consumer chain in the pig industry. Develop, plan, implement and manage pig breeding and selection, nutrition, reproduction and health programmes for the breeding herd. Evaluate management practices involved in effective feeding, breeding, reproduction, health and housing of pigs as well as their relationship in assuring a profitable pig enterprise.		
Module code: ANDM 321	Semester 2	
Title: Practical Animal Production		
Module outcomes:		
Upon completion of this module, the learner(s) should be able to apply practical handling skills and management to handle farm animals. Observe and be exposed to major livestock and related industries in Southern Africa. Manage feeding, breeding and keep farm records in assurance of general livestock management. Evaluate animal breeding, nutrition, reproduction and health programmes. Assess the viability, economic outlook and current situations of subsistence and commercial livestock farm enterprises. Write a scientific report about the work experience done.		

MA.2.4 BSC AGRIC – ANIMAL SCIENCE

Module code: ANSM 121	Semester 2	
Title: Introduction to Agricultural Biometry		
Module outcomes:		
Upon completion of this module, the learner(s) should be able to summarize data in the form of graphs and descriptive statistics. Solve probability application problems in agriculture. Differentiate random variables and associated distributions, relationship between population and samples within context of Central Limit Theorem. Write statistical hypothesis, carryout analyses and test hypotheses based on simple statistical procedures.		
Module code: ANSM 211	Semester 1	
Title: Introduction to Animal Science		
Module outcomes:		
Upon completion of this module, the learner(s) should be able to describe the South African animal science industry overview. Explain the role of animal science to economic and human development. Distinguish, Identify and differentiate breeds of farm animals used in South Africa and modes of animal classification. Justify why breeds of farm animals are located in different environments based on their adaptability features and mechanism. Summarise the basic introductory principles of the physiology of growth and development, reproduction, breeding, nutrition and health of farm animal.		
Module code: ANSM 214	Semester 1	
Title: Ruminant Animal Production		
Module outcomes:		
Upon completion of this module, the learner(s) should be able to describe the South African ruminant industry overview. Describe the economic importance of the ruminant industry in human and economic development. Identify and describe the physical and production characteristics of different breeds of sheep, goats, beef and dairy cattle. Locate different breeds of sheep, goats, beef and dairy cattle to various livestock production systems and climatic conditions. Explain the role and application of management principles such as rearing systems (calves/lambs/kids), breeding and selection, reproduction and feeding (nutrition) in various ruminant production systems.		

Module code: ANSM 222	Semester 2	
Title: Animal Genetics and Breeding		
Module outcomes: Upon completion of this module, the learner(s) should be able to evaluate the importance of cell division in living organisms. Describe how genetic information is carried and passed on from one generation to next. Explain the basis of how genetic information is inherited using the principles of Mendel and relate phenotype to genetic makeup. Outline the possible deviations from the expected Mendelian ratios and provide comprehensive explanations for them.		
Module code: ANSM 223	Semester 2	
Title: Animal Nutrition		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the importance of animal nutrition and explain the processes of digestion, absorption and metabolism in ruminants and non-ruminants and their end products. Identify, classify and distinguish the main components of feed of plant and animal origin consumed by farm animals and South African feedstuff according to their nutritive value. Summarize role played by nutrients in the health of animals and the importance of enzymes in animal nutrition. Solve problems related to the determination of the nutrient content of feeds using proximate system of analysis. Justify the importance of conducting digestibility trials.		
Module code: ANSM 224	Semester 2	
Title: Non-Ruminant Production		
Module outcomes: Upon completion of this module, the learner(s) should be able to demonstrate an understanding of the poultry and pig industry, poultry and pig breeds and contribution in agriculture. Evaluate and provide recommendation on monogastric products and their quality and marketing. Develop a comprehensive plan of a poultry production unit health programme. Propose strategies on improvement of poultry production system and appropriate breeds. Apply modern management techniques in efficient feeding and rearing of broilers and layers.		
Module code: ANSM 311	Semester 1	
Title: Principles of Veld Management		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the growth and developmental morphology of forages. Compare and contrast the different types of grazing systems in veld management. Summarise the procedures for the production of hay and silage and be able to suggest a fodder production and preservation plan given specific Farm condition. Differentiate grassland management in different veld types and identify the major grouping of veld types in S.A. and be aware of their nutritional value. Justify the need for rangeland monitoring and awareness of the behaviour of ruminants on grazing as well as the need for grazing in livestock production.		
Module code: ANSM 312	Semester 1	
Title: Applied Agricultural Biometry		
Module outcomes: Upon completion of this module, the learner(s) should be able to demonstrate understanding of the theory and concept of experimental design. Apply matrix algebra to solve different linear model problems. Analyze and interpret results of different statistical models. Use computer software to analyse data generated from different statistical models and interpret outputs.		
Module code: ANSM 313	Semester 1	
Title: Agricultural Biochemistry		
Module outcomes:		

<p>Upon completion of this module, the learner(s) should be able to, describe the biochemical importance of water and its ionization products in the body. Differentiate different solutions into basic or acidic medium solutions based on their pH. Differentiate between proteins, carbohydrates, lipids, nucleic acids and vitamins on the basis of their elementary composition and biochemical importance. Distinguish the components of DNA & RNA, recognise the genetic implications of several enzymes in key metabolic process and the vital importance of the mechanism of enzyme synthesis within the cell.</p>		
Module code: ANSM 314	Semester 1	
<p>Title: Physiology of Reproduction and Growth</p>		
<p>Module outcomes:</p> <p>Upon completion of this module, the learners should be able to identify reproductive systems of the female and male animals and conceptualise their functions. Integrate the physiological mechanisms that regulate reproduction in farm animals. Summarise the process of fertilisation, gestation and parturition in farm animals. Apply reproductive technologies to improve and manage reproduction in farm animals and solve problems related to reproduction in farm animals. Evaluate growth and development in domestic animals</p>		
Module code: ANSM 321	Semester 2	
<p>Title: Applied Ruminant Nutrition</p>		
<p>Module outcomes:</p> <p>Upon completion of this module, the learner(s) should be able to solve and produce digestibility results using different feed in ruminant animals and also be able to discuss factors affecting digestibility. Describe the system expressing the energy value of food for ruminants. Summarize the fate of dietary crude protein in the ruminant animals and justify the need for nutrient requirements of the lactating dairy cows. Compare and contrast factors affecting voluntary intake of food in ruminant. Create a diet formulation among different types of feed and distinguish among various types of secondary compounds in feed.</p>		
Module code: ANSM 322	Semester 2	
<p>Title: Planted Pastures and Fodder Crops</p>		
<p>Module outcomes:</p> <p>Upon completion of this module, the learner(s) should be able to explain and describe the role of planted pastures and crops. Summarise the problems associated with planted pasture. Identify species available on market and how species fit into a fodder flow program. Distinguish between the use and provision of different species in different season.</p>		
Module code: ANSM 323	Semester 2	
<p>Title: Quantitative Genetics</p>		
<p>Module outcomes:</p> <p>Upon completion of this module, the learner(s) should be able to apply the principles of gene and genotypic frequency determination procedure for economically important traits in livestock population. Demonstrate understanding of statistical principles as applied to quantitative traits. Use the procedure for testing breeding animals for undesirable genetic defects. Estimate heritability and repeatability for various economically important livestock traits. Measure response to selection, inbreeding and heterosis for various economically important livestock traits.</p>		
Module code: ANSM 324	Semester 2	
<p>Title: Smallstock Production and Science</p>		
<p>Module outcomes:</p> <p>Upon completion of this module, the learner(s) should be able to describe the South African smallstock industry overview and its economic importance in human and economic development. Identify and describe the physical and production characteristics of different breeds of sheep and goats. Locate different breeds of sheep and goats, to various livestock production systems and climatic conditions. Explain the role and</p>		

application of management principles such as rearing systems (lambs/kids), breeding and selection, reproduction and feeding (nutrition) in smallstock production systems. Explain the principles of marketing in sheep and goats enterprise.		
Module code: ANSM 411	Semester 1	
Title: Applied Monogastric Nutrition		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe how to evaluate energy content of feeds and explain how this energy is partitioned within the animal body. Solve problems of predicting the animals performance from a particular level of energy intake and to also on predicting the energy intake required to obtain a particular level of performance. Measure protein quality in feed required for monogastric animals in different production stages. Describe energy, protein, vitamin and mineral requirements for maintenance and growth reproduction in monogastric animals. Describe energy, protein, vitamin and mineral requirements for the lactating sow and factors influencing voluntary feed in take in monogastric animals.		
Module code: ANSM 412	Semester 1	
Title: Applied Animal Breeding		
Module outcomes: Upon completion of this module, the learner(s) should be able to apply statistics and matrix algebra operations to solve animal breeding problems. Formulate breeding objectives and develop selection index. Demonstrating understanding of the theory and concept of mixed model application in animal breeding. Use animal breeding software for estimation of breeding values from different genetic models.		
Module code: ANSM 413	Semester 1	
Title: Research Project and Seminar I		
Module outcomes: Upon completion of this module, the learner(s) should be able to prepare and submit project proposal. Review literature on a topic submitted. Present a seminar.		
Module code: ANSM 414	Semester 1	
Title: Large Stock Production and Science		
Module outcomes: Upon completion of this module, the learner(s) should be able to recognise the economic important role of the large stock industry in South Africa. Plan, monitor and critically evaluate, breeding, reproductive, nutritional and health programmes. Design, recommend and use large stock facilities, equipments and buildings. Develop, plan, implement and manage large stock enterprise according to their production systems. Implement animal health programmes to assure preventative measures to various diseases.		
Module code: ANSM 421	Semester 2	
Title: Research project and Seminar II		
Module outcomes: Upon completion of this module, the learner(s) should be able to present data summary and interpretation of results using statistical analysis system. Submit dissertation from the conducted research. Collect, enter data using Microsoft Excel and also to analyse data from research conducted. Conduct mini-research project in Animal Science field and write research report.		
Module code: ANSM 422	Semester 2	
Title: Pig Science		
Module outcomes: Upon completion of this module, the learner(s) should be able to recognise the potential contribution of the South African Pork industry to animal protein production. Integrate pig production systems with components of pork quality and major aspects of producer to consumer chain in the pig industry. Develop, plan, implement and manage pig breeding and selection, nutrition, reproduction and health programmes for the breeding herd.		

Develop, plan, implement and manage large stock enterprise according to their production systems. Evaluate management practices involved in effective feeding, breeding, reproduction, health and housing of pigs as well as their relationship in assuring a profitable pig enterprise.		
Module code: ANSM 423	Semester 2	
Title: Practical Experience		
Module outcomes: Upon completion of this module, the learner(s) should be able to apply practical handling skills and management to handle farm animals through observations and exposure to major livestock and related industries in Southern Africa. Manage feeding, breeding and keep farm records in assurance of general livestock management. Evaluate animal breeding, nutrition, reproduction and health programmes. Assess the viability, economic outlook and current situations of subsistence and commercial livestock farm enterprises. Write a scientific report about the work experience.		
Module code: ANSM 424	Semester 2	
Title: Poultry Science		
Module outcomes: Learner(s) should be able to demonstrate an understanding of the poultry industry, poultry breeds and contribution in animal agriculture. Evaluate and provide recommendation on poultry egg and meat quality and implement the marketing strategies in poultry enterprises. Develop a comprehensive plan of a poultry production unit health programme. Propose strategies on improvement of poultry production system and appropriate breeds. Apply modern management techniques in efficient feeding and rearing of broilers and layers.		
Module code: ANSM 425	Semester 2	
Title: Dairy and Meat Science		
Module outcomes: Upon completion of this module, the learner(s) should be able to outline the history and development of the South African dairy and meat industries and identify factors affecting production and composition of milk. Integrate the principles and factors involved in dairy and meat production. Summarise the physiological mechanism mammogenesis, lactogenesis, galactopoiesis, milk secretion and involution. Analyse quality control and regulations in production and processing of dairy and meat products. Evaluate milking parlour and equipment and abattoir as well as system analysis and operation.		

MA.2.5 Agric Economics

Module code: AEDM 211	Semester 1	
Title: Introduction to Agricultural Economics		
Module outcomes: To provide an understanding of the main economic issues, concepts and tools of agricultural economics. Equip learners by developing an understanding of solving basic economic problems, outlining the potential solutions to those problems and describing the major types of economic system.		
Module code: AEDM 314	Semester 1	
Title: Farm Management and Accounting		
Module outcomes: To able to demonstrate understanding of farm management functions, Apply farm management principles and perform farm management and farm accounting tasks, Demonstrate understanding of financial planning, analysis and control in farming, apply and analyze financial planning and control tasks in farming environment.		

Module code: AECM 111	Semester 1	
Title: Introduction to Agricultural Economics I		
Module Outcomes: To provide a sound understanding of the basic economic relationship amongst household, firms, government and to provide solutions to global economic challenges. Interpret and analyse tables (demand, supply schedules etc) and graphs in agricultural economics. Manage and handle economic data and tasks.		
Module code: AECM 213	Semester 1	
Title: Food Security Analysis		
Module outcomes: To able to demonstrate an understanding of the meaning and concepts of food Security, analyze and identify the indicators of food security, discuss the influence household types and food security, describe food security situation in terms of South African agricultural policy and explain the determinants of food security.		
Module code: AECM223	Semester 2	
Title: Farm Accounting		
Module Outcomes: To be able to demonstrate an understanding the importance and the use of farm accounting for farm management, to make use of records and accounts as a tool of farm management and to understand and apply important depreciation and tax decisions.		
Module code: AECM 311	Semester 1	
Title: Agricultural Micro - Economics		
Module outcomes: To have knowledge and demonstration of understanding of relevant terms, rules, concepts, principles and theories to describe microeconomics and be able to apply these knowledge and principles in the real world situations. Conduct economic analysis in agricultural and related enterprises. Advise agricultural stakeholders on micro-economics matters.		
Module code: AECM 312	Semester 1	
Title: International Agricultural Trades		
Module outcomes: To have knowledge and demonstration of understanding of relevant terms, rules, concepts, principles and theories to describe international agricultural trade and be able to apply these knowledge and principles in the real world situations.		
Module code: AECM 313	Semester 1	
Title: Agricultural Statistics for Research I		
Module outcomes: To be able to use application of linear regression and general linear model to economic data, use and interpretation of at least two econometric software for data analysis. Discuss the problems of estimation when classical assumption of linear regression are violated and application of Chi-square analysis, estimation of Index numbers and time series analysis in the agricultural sector.		
Module code: AECM 314	Semester 1	
Title: Farm Management and Accounting		
Module outcomes: To able to demonstrate understanding of farm management functions, Apply farm management principles and perform farm management and farm accounting tasks, Demonstrate understanding of financial planning, analysis and control in farming, apply and analyze financial planning and control tasks in farming environment.		

Module code: AECM 321	Semester 2	
Title: Land Resource and Environmental Economics		
Module outcomes: To able to demonstrate an understanding of theories of land resource economics and the framework of land resource management, Application of economic tools to resources use and environmental issues, discuss the interrelationship between environment, economic growth and public policy on environmental issues and quality and discuss environmental problems in South Africa.		
Module code: AECM 322	Semester 2	
Title: Agricultural Production Economics		
Module outcomes: To able to optimize the objective function of farming community or the nation within a framework of limited resources, to provide guidance to individual farmers in using their resources in most efficient way and facilitate the most efficient use of resources from economic point of view.		
Module code: AECM 323	Semester 2	
Title: Agricultural Marketing		
Module outcomes: To able to apply agricultural marketing and risk management principles in practice. Students will be able to understand the role of agricultural marketing and risk management in South Africa and elsewhere in the world. Students learn about and apply the basic concepts and practices of modern agricultural marketing and risk management as they are used in a wide variety of settings.		
Module code: AECM 325	Semester 2	
Title: Agricultural Macro- Economics		
Module outcomes: To able to show knowledge and demonstration of understanding of relevant terms, rules, concepts, principles and theories to describe macroeconomics and be able to apply these knowledge and principles in the real world situations. Be able to advise agricultural stakeholders, i.e. organized agriculture, government, NGOs etc., on macro-economic matters.		
Module Code: AECM 411	Semester 1	
Title: Agricultural Project Appraisals and Management		
Module outcomes: To able to be an efficient, competent agricultural project manager, who understands project appraisal and management principles and can use the knowledge acquired practically. Contribute towards improvement of project appraisal and management locally and nationally and be to function within a group for mutual support, sustenance to peers for professional growth and development.		
Module Code: AECM 413	Semester 1	
Title: Quantitative Methods in Agricultural Economics		
Module Outcomes: To be able to understand apply basic mathematical methods that are essential for adequate economic analysis and proper understanding of the current economic literature.		
Module Code: AECM 414	Semester 1	
Title: Agricultural Statistics for Research II		
Module Outcomes: Estimation of simultaneous equation models, describe the properties of stochastic and linear time series and estimate regression models including dummy variables and dummy dependent models. Application of single equation models		

Module Code : AECM 415	Semester 1	
Title: Agribusiness Management		
Module Outcomes: To be able to apply production, financial, marketing and human resource management principles to the farming environment and a wide variety of farm business settings.		
Module Code: AECM 421	Semester 2	
Title: Farm Planning and Linear Programming		
Module Outcomes: To be able to use linear programming and other operations research methods/models in solving allocative and decision problems of agriculture such as what to produce, how much to produce, and the most profitable enterprise combinations, costs reduction and general optimization of resource usage.		
Module code: AECM 422	Semester 2	
Title: Agricultural Policy Analysis		
Module outcomes: To able to apply agricultural policy principles to the farming environment and a wide variety of farm business settings for efficient and effective agricultural projects and programme implementation		
Module code: AECM 423	Semester 2	
Title: Agricultural Finance		
Module outcomes: To able to apply financial principles to the farming environment and be familiar with numerous management functions, regardless of the size of the farm business.To learn about and apply the basic concepts and practices of modern finance principles as they are used in a wide variety of settings. Use the techniques of financial analysis to analyze repayment ability of a farm.		
Module code: AECM 424	Semester 2	
Title: Agriculture and Economic Development		
Module outcomes: To able to apply agricultural policy principles to the farming environment and a wide variety of farm business settings for efficient and effective agricultural projects and programme implementation, demonstrate very good understanding of principles of technical, allocative, scale and economic efficiencies.		

MA.2.6 AGRICULTURAL EXTENSION

Module code: AXDM 211	Semester 1	
Title: Fundamentals of Agricultural Extension		
Module outcomes: To develop an understanding of the concepts of agricultural extension and its environment and demonstrate an understanding of the principles of Agricultural Extension,demonstrate an understanding of basic social - cultural and psychological concepts in agricultural extension and communication process in agricultural extension,understanding of extension program planning, management and evaluation concepts.		
Module code: AXDM 311	Semester 1	
Title: Agricultural Extension for Development		
Module outcomes: To able to demonstrate understanding of the role of extension in development,teaching and learning process in agricultural extension and the use of different extension teaching methods.		

Module code: AEXM 211	Semester 1	
Title: Fundamentals of Agricultural Extension		
Module outcomes: To able to demonstrate understanding of of principles of Agricultural Extension, identify challenges of agricultural extension, demonstrate an understanding of the process and elements of commination process, identify different extension teaching methods and extension program planning and management concepts.		
Module code: AEXM 212	Semester 1	
Title: Communication and Agricultural Technology Transfer		
Module outcomes: To able to describe the processes of communication ,analyze the communication process in relation to extension service delivery and describe different technology transfer models,explain technology transfer processes and highlight the synergy of technology transfer processes and models.		
Module code: AEXM 222	Semester 2	
Title: Agricultural Extension for Development		
Module outcomes: To able to demonstrate an understanding of the role of extension in the development process and an understanding of the teaching and learning process in agricultural extension, the use of different extension teaching methods and identify,develop an extension program for development purposes.		
Module code: AEXM 325	Semester 2	
Title: Agricultural Rural Sociology		
Module outcomes: To able to demonstrate and understanding of the meaning, nature and scope of rural sociology,theories of social change,organization of societies and problems of cultural and directed change,definition of diffusion and adoption and processes of diffusion and adoption,adopter categories and diffusion curves.		

MA.2.7 DIPLOMA in AGRIC- PLANT SCIENCES SCIENCE

Module code :CSDM 111	Semester 1	
Title: Botany for Agriculture		
Module outcomes: Learners will be able to understand basic plant taxonomy, morphology, and anatomy. Learners will be able to understand the processes of photosynthesis and transpiration and basic genetic concepts.		
Module code: CSDM 121	Semester 2	
Title: Introduction to Crop Production		
Module outcomes : Learners will be able to appreciate the importance of crop plants in human welfare. Learners will be able to understand the objectives of crop production and be familiar with the basic concepts of crop production strategies relating to yield and quality. Learners will be familiar with fertilizer types, rates and methods of application and know the different soil factors affecting crop production.		
Module code: CSDM 211	Semester 1	
Title: Intro to Soil Science		
Module outcomes: Students will be able to demonstrate an understanding of soil as a natural entity for sustainable agriculture as they study each of the areas of soil science: soil genesis, soil physics, soil conservation, soil microbiology, soil chemistry, and soil fertility. Knowledge of these soil properties will enable students gain basic understanding of soils and their importance and relevance in different areas of agriculture. They will therefore be able to		

<p>appreciate soils as a natural resource for South Africa and for the world. Students will develop an understanding of the role that soils play in the agricultural and economic situation in South Africa and the world.</p>		
Module code: CSDM 214	Semester 1	
Title: Farm Practical I		
<p>Module outcomes: Practical skills in the production of vegetable. Ability to identify weeds, insects and diseases associated with vegetables. Application of appropriate control measures for pests. Irrigation and fertilizer management in the production of vegetables. Ability to select and correctly use farm implements and machinery for various cultural practice. Harvesting, sorting and grading crop products for marketing. Business plan for vegetable and field crops. Yield estimations for vegetables and crops. Design of vegetable production programmes.</p>		
Module code: CSDM 213	Semester 1	
Title: Farm Machinery		
<p>Module outcomes: Ability to take proper care of farm machinery and implements. Ability to use farm implements and machinery properly. Ability to do minor repairs of farm implements and machinery. Ability to do budgeting of farm operations. Use of equipment used in the construction of farm buildings. An understanding of the construction of farm buildings and the budgeting for construction.. Ability to produce simple designs of farm buildings..</p>		
Module code: CSDM 221	Semester 2	
Title: Principles of Crop Improvement		
<p>Module outcomes: Learners will be able to understand and appreciate the importance of plant breeding in increasing crop yield and quality and have an appreciation of plant breeder's work. Learners will be able to understand the difference between self- and cross-pollinated crops. Learners will be able to understand how genetic principles relate to plant breeding methods. Learners will be able to understand seed certification and multiplication principles.</p>		
Module code: CSDM 222	Semester 2	
Title: Soil fertility and Fertilizers		
<p>Module outcomes: Students will be able to demonstrate a knowledge of how soil conditions affect plant growth and suggest possible management practices to increase crop yield. . Students will gain knowledge of the 17 essential elements required for plant growth in regards to factors which affect nutrient availability in soils. Students will be able to evaluate the fertility status of soils and make subsequent fertilizer recommendations.</p>		
Module code CSDM 224	Semester 2	
Title: Farm practical II		
<p>Module outcomes: Practical skills in the production of vegetable and field crops. Ability to identify weeds, insects and diseases associated with vegetable and field crops. Application of appropriate control measures for pests. Irrigation and fertilizer management in the production of vegetables and field crops. Ability to select and correctly use farm implements and machinery for various cultural practices mainly for field crops. Harvesting, sorting and grading crop products for marketing. Business plan for field crops. Yield estimations for field crops. Design of crop rotation programmes for field crops.</p>		
Module code: CSDM 324	Semester 2	
Title: Elementary Irrigation		
<p>Module outcomes: Learners will be able to explain the role of irrigation in agriculture. Ability to select an appropriate irrigation system for horticultural and field crops and environment. Diagnostic</p>		

skills in operation and maintenance of irrigation infrastructure. Agronomic management of irrigated crops. Ability to monitor crop water requirement and schedule irrigation. Ability to manage drainage and salinity problems in irrigation.		
Module code: CSDM 311	Semester 1	
Title: Agronomy: Agronomy of Summer Crops		
Module outcomes: For each prescribed summer crop, learners will be able to know its origin, economic importance, distribution, and morphology, know its climatic and soil requirements and its appropriate cultural practices.		
Module code: CSDM 312	Semester 1	
Title: Plant protection		
Module outcomes: Ability, understand and interpret the reports on plant Protection. Ability to identify common garden and field pests and diseases. . Come up with appropriate control measures for the identified pests. Learners should be competent in knapsack and boom spray calibration. Introduce new information about plant protection to farmers. Guide and supervise farmers regarding plant protection. Understand the quarantine /Phytosanitary regulations of RSA		
Module code: CSDM 215	Semester 2	
Title: Vegetable Production		
Module outcomes: Learners will be able to select and grow vegetables in their appropriate seasons. Learners will be knowledgeable in the agronomy of major vegetables grown in RSA. Learners should be competent in organic farming principles. Apply theoretical and practical knowledge to guide farmers and gardeners to produce vegetables.		
Module code: CSDM 321	Semester 2	
Title: Agronomy of Winter Crops		
Module outcomes: Module outcomes: For each prescribed winter crop, learners will be able: To know its origin, economic importance, distribution, and morphology. To know its climatic and soil requirements. To know its appropriate cultural practices.		
Module code: CSDM 322	Semester 2	
Title: Weeds and Weed Control		
Module outcomes: Ability to identify weed species. Able to come up with weed control measures. To comprehend and interpret literature related to weed control. Supervise and guide farmers how to control weeds. Introduce to farmers new technology of weed. Understand the use of selective and non-selective herbicides. Be competent in knapsack and boom sprayer calibration		
Module code: CSDM 325	Semester 2	
Title: Practical Crop Production		
Module outcomes: Ability to layout field trials. Ability to operate farm machinery properly. Ability to calibrate implements properly . Ability to weigh and apply fertilizers properly. Ability to classify soils at a particular site. Ability to calculate yield and plant population estimates.		
Module code: CSDM 323	Semester 6	
Title: Elements of Agric. Microbiology		
Module outcomes: Learners are able to identify and describe the beneficial and pathological types of microorganisms, diseases they cause, mode of dissemination and control strategies.		
Module code: CSDM 315	Semester 1	
Title: Pedology and Soil Classification		
Module outcomes:		

Ability to select best possible use for the particular soil. Ability to assess land for its suitability for irrigation. Ability to do preliminary soil survey. Ability to recommend best possible use of a particular land.		
Module code: CSDM 223	Semester 2	
Title: Soil Conservation		
Module outcomes: Learners will be able to describe various types of land degradation and how they are caused, as well as identify and assess different stages and forms of soil degradation. They will also have an understanding of how different soil management practices affect soil quality and the role that these have on agricultural productivity. Students at the end of the module will be able to identify and describe different strategies used in soil conservation		
Module code: CSDM 225	Semester 2	
Title: Fruit Production		
Module outcomes: Ability to identify different fruit crops. Apply theoretical and practical knowledge in the production and cultural practices of fruit crops. Be competent in the fruit propagation techniques such as budding and grafting, Harvesting, grading storage and marketing of fruit produce. Harvesting, grading storage and marketing of fruit produce. Learners should be knowledgeable in the role of plant hormones in the growth, flowering and ripening of fruits. Learners should be skilled in basic post-harvest fruit processing techniques.		
Module code: CSDM 212	Semester 1	
Title: Agricultural Climatology		
Module outcomes: Ability to describe the basic weather elements in agriculture, their measurement and influence on crop and animal production in the North West Province, South Africa and the world at large. Ability to collect and summarize the basic weather elements in agriculture.		

MA.2.8 BSc Agric - Plant Sciences

Module code: CSPM 211	Semester 1	
Title: Introduction to Soil Science		
Module outcomes: Students will be able to demonstrate an understanding of soil as a natural entity for sustainable agriculture. They will gain insight into the genesis, physics, chemistry, biology and microbiology of soils. Basic knowledge of how these soil properties interact to affect soil quality for different purposes will be gained. It is anticipated that students at the end of the module will have the skills and ability to perform basic tests aimed at assessing soil fertility. They will be able to appreciate soils as a natural resource for South Africa and for the world. Students will therefore develop an understanding of the role that soils play in the agricultural and economic situation in South Africa and the world.		
Module code: CSPM 212	Semester 1	
Title: Agricultural Climatology		
Module outcomes: Ability to summarize and interpret weather data. Ability to identify the climate variables that may affect agricultural productivity. Learners will have skills needed to read and measure weather data. Ability to predict effects of man's activities on climate change.		
Module code: CSPM 213	Semester 1	
Title: Farm Machinery		
Module outcomes: Ability to take proper care of farm machinery and implements. Ability to use farm implements and machinery properly. Ability to do budgeting of farm operations. An understanding of how farm buildings are constructed and the budgeting for construction of		

farm buildings. Ability to produce simple designs of farm buildings.		
Module code: CSPM 221	Semester 2	
Title: Introduction to Crop Production		
Module outcomes: Learners will be able to appreciate how important crop plants are in human welfare. Learners will be able to understand the objectives of crop production. Learners will be familiar with the basic concepts of crop production strategies relating to yield and quality. Learners will be familiar with fertilizer types, rates and methods of application. Learners will know the different soil factors affecting crop production.		
Module code: CSPM 222	Semester 2	
Title: Soil fertility and fertilizers		
Module outcomes: Students will be able to demonstrate a knowledge of how soil conditions (such as soil texture, soil pH, clay mineralogy and cation exchange capacity) affect plant growth and suggest possible management practices to increase crop yield. Students will gain knowledge of the 17 essential elements required for plant growth in regards to factors which affect nutrient availability in soils. Students will be able to evaluate the fertility status of soils and make subsequent fertilizer recommendations.		
Module code: CSPM 223	Semester 2	
Title: Soil Conservation		
Module outcomes: Learners will be able to describe various types of land degradation and how they are caused, as well as identify and assess different stages and forms of soil degradation. They will also have an understanding of how different soil management practices affect soil quality and the role that these have on agricultural productivity. Students at the end of the module will be able to identify and describe different strategies used in controlling soil conservation. They will also be able to explain the role of Government and NGOs in soil conservation.		
Module code: CSPM 224	Semester 2	
Title: Agricultural Microbiology		
Module outcomes: The learners will be able to identify and describe microorganisms that commonly affect soils, plants and animals. They will have the ability to differentiate beneficial and pathogenic microorganisms in agriculture, and have an understanding of the role that both beneficial and pathogenic microorganisms play in agricultural productivity. Learners will also be equipped with knowledge on how to control the dissemination of microorganisms that are pathogenic to plants and animals.		
Module code: CSPM 311	Semester 1	
Title: Agronomy Summer Crops		
Module outcomes: For each prescribed summer crop, learners will be able : To know its origin, economic importance distribution, and morphology. To know its climatic and soil requirements and its appropriate cultural practices. To know its fertilizer requirements. To know its fertilizer requirements. To know current challenges and topical issues in the production of the crop and related areas of research focus.		
Module code: CSPM 312	Semester 1	
Title: Plant Protection		
Module outcomes: Ability to comprehend and interpret research information relating to plant protection. Ability to identify plant pests and diseases in the field. To be skilled and understand quarantine/Phytosanitary regulations, Understand f Integrated Pest Management Principles, Ability to recommend appropriate pests control measures to farmers. Ability to interpret legislative measures in plant protection		

Module code: CSPM 313	Semester 1	
Title: Vegetable Production		
Module outcomes: Understand soil nutritional requirements of various vegetables grown in RSA, Knowledgeable in the general agronomy principles of important vegetables in RSA. Learners will be able to select appropriate vegetable crops in different seasons of an area. Learners will be able to understand and interpret horticultural research articles. Learners should be knowledgeable in organic production of vegetables.		
Module code: CSPM 321	Semester 2	
Title: Agronomy of Winter Crops		
Module outcomes: For each prescribed winter crop, learners will be able to: To know its origin, economic importance, distribution, and morphology. To know its climatic and soil requirements. To know its appropriate cultural practices. To know current challenges and topical issues in the production of the crop and research focus in addressing challenges.		
Module code: CSPM 322	Semester 2	
Title: Weeds and Weed Control		
Module outcomes: Learners should have an in-depth understanding of the biology of agricultural weeds. Furthermore, they should be able to identify weed species. Able to come up with appropriate weed control measures. Learners should have scientific knowledge in the use of herbicides, i.e. modes of action and metabolism. Other non-chemical methods of weed control measures should be covered. Importantly, they should be able to comprehend and interpret literature related to weed control. Supervise and guide farmers how to control weeds. Introduce to farmers new technology of weed control.		
Module code: CSPM 323	Semester 2	
Title: Fruits Production		
Module outcomes: Ability to select appropriate fruit crops for an area. Apply theoretical and practical knowledge in establishment and management of orchards and vineyards, giving particular attention to the following: propagation techniques, pruning and training, processing and marketing of fruit produce.		
Module code: CSPM 324	Semester 2	
Title: Principles of Irrigation		
Module outcomes: Learners will know the basic concepts, tools, and skills used to deliver water efficiently and effectively on both a field and garden scale. They will also have the ability to identify the most efficient irrigation system to use under various circumstances because they will have an understanding of the movement and cycling of water in agricultural systems, and the environmental factors that influence the type, frequency, and duration of irrigation. Learners will be able to calculate the water requirement for irrigation, and design a simple irrigation system. They will be able to conduct a simple evaluation of an existing irrigation system.		
Module code: CSPM 325	Semester 2	
Title: Plant Physiology		
Module outcomes: Learners will be able to understand crop-soil-water relations. Learners will be able to understand plant mineral nutrition. Learners will be able to understand nitrogen metabolism in plants. Learners will be able to understand plant photosynthetic processes. Learners will be able to understand the translocation process. Learners will be able to understand the significance of plant hormones in crop production. Learners will be able to understand the process of dormancy in crop plants.		

Module code: CSPM 411	Semester 1	
Title: Crop Production Systems		
Module outcomes: To give learners a global overview of different crop production systems. To highlight and demonstrate the differences between monoculture and multiple cropping. To know the advantages and disadvantages associated with each of the two major crop production. To be able to analyse and interpret results from multiple cropping systems. To be able to know how to assess yield advantages from multiple cropping systems.		
Module code: CSPM 412	Semester 1	
Title: Plant Breeding		
Module outcomes: Learners will be able to understand basic plant breeding concepts. Learners will be able to understand the relationship between genetics and plant breeding. To be able to demonstrate an understanding of the methods used for breeding self – and cross-pollinated crops. To be able to demonstrate an understanding of the relationship between other crop science disciplines and plant breeding.		
Module code: CSPM 413	Semester 1	
Title: Horticultural Science		
Module outcomes: Learners will be able to understand the effect of climate on horticultural production. Demonstrate the ability to comprehend scientific literature related to horticultural production. Learners should also have understanding and practical skills/exposure in scientific propagation techniques such as use of tissue culture, hydroponics in horticulture. Conduct projects to demonstrate ability of project management. Be able to add value to horticultural production in RSA.		
Module code: CSPM 414	Semester 1	
Title: Soil Chemistry		
Module outcomes: Discussions of interactions between soil solids, precipitates and solution phases including: mineralogy, ion exchange, adsorption/desorption, weathering and buffering, soil colloidal behavior, acidic and basic soils, salinity, and models of solution and solid phase interactions. As well, soil organic matter and organic compounds are discussed, focusing on the characteristics of organic compounds that impact their reactivity. Students will be able to evaluate and make recommendations for crop production based on their gained knowledge of these soil inorganic and organic reactions		
Module code: CSPM 415	Semester 1	
Title: Pedology and Soil Classification		
Module outcomes: Students will understand soil formation in regards to chemical & physical weathering and the soil pedogenic processes. Students will appreciate and understand the relationship between the factors of soil formation and soil formation in different environments. They will be able to describe various soil profiles and determine the environment of formation of each. They will be able to utilize soil field, laboratory, and environmental data to classify soils using different soil classification systems.		
Module code: CSPM 416	Semester 1	
Title: Soil Physics		
Module outcomes: Learners will know the basic concepts of transport and retention for water and solutes in the soil and comprehend transfer processes for water, air, solutes, and heat in soils that influence the physical environment of the root zone for plant growth. They will be able to perform laboratory and field experiments to measure selected physical properties of soils that affect the fate and transport of agrochemicals in soils. They will also be able to apply the		

principles governing the flow and retention of water and solutes in the root zone to solve simple problems involving general water management of soil-water-systems used in agriculture.		
Module code: CSPM 417	Semester 1	
Title: Practical Crop Production I		
Module outcomes: Ability to layout field trials. Ability to operate farm machinery properly. Ability to calibrate implements properly system. Ability to calibrate implements properly system. Ability to classify soils at a particular site. Ability to calculate yield and plant population estimates. Ability to calculate yield and plant population estimates.		
Module code: CSPM 418	Semester 1	
Title: Project and Seminar I		
Module outcomes: Able to prepare and submit project proposal. Conduct a critical review of literature on a topic submitted. Able to present a seminar.		
Module code: CSPM 421	Semester 2	
Title: Crop Physiology		
Module outcomes: Learners will be able to understand crop growth analysis. Learners will be able to understand the physiological basis of crop yield.. To be able to demonstrate an understanding source-sink relationships. Learners will be able to appreciate and understand the concept of crop Idiotypes		
Module code: CSPM 422	Semester 2	
Title: Crop Protection		
Module outcomes: Ability to understand and apply scientific principles in practical crop protection. covering the following: Entomology, Plant Pathology and Nematology. Should have understanding of Principles of Integrated Pest Management Programme. Under Entomology the Learners should have an indepth knowledge of insect pest classification focusing on the following important Genera: Hymenoptera, Coleoptera, and Lepidoptera. Under Plant Pathology the Learners should be knowledgeable in Plant Bacteriology, Mycology and Virology, that is, etiology and epidemeology of the major plant diseases of economic importance. . The Learners should also have basic understanding of Nematology. In general the Learners should also demonstrate critical and creative thinking in research and development in areas of crop protection		
Module code: CSPM 427	Semester 2	
Title: Practical Crop Production II		
Module outcomes: Ability to layout field trials. Ability to operate farm machinery properly. Ability to calibrate implements properly system Ability to weigh and apply fertilizers properly. Ability to classify soils at a particular site. Ability to calculate yield and plant population estimates.		
Module code: CSPM 428	Semester 2	
Title: Project and Seminar II		
Module outcomes: Learners will be able to conduct and manage research under supervision ,Able to analyze, criticize and interpret scientific literature in crop and soil science .Able to communicate research results through an oral presentation / seminar, Able to write a scientific report.		
Module code: CSPM 424	Semester 2	
Title: Soil Microbiology		
Module outcomes: Learners will be able to classify microorganisms in the soil, and appreciate the soil properties that favour the survival of the vast number and variety of microorganisms that inhabit the soil. They will also have the ability to determine how differenmt soil		

management techniques affect the diversity and population of microorganisms in the soil. Learners will be able to conduct measurements in soil microbiology, and apply microbiological technology to improve crop production.

MA.2.9 BSC in LAND MANAGEMENT

Module code: PCPM 112	Semester 1	
Title: Botany of Agriculture		
Module outcomes : Learners will be able to appreciate and describe Morphological, Anatomical, and Taxonomic differences among common crop plants; discuss and describe the processes involved in Photosynthesis and transpiration; Describe a plant cell; Appreciate the process and importance of mitosis and meiosis; Solve problems on monohybrid and dihybrid inheritance.		
Module code: CSPM211	Semester 1	
Title: Introduction to Soil Science		
Module outcomes: Students will be able to demonstrate an understanding of soil as a natural entity for sustainable agriculture as they study each of the areas of soil science: soil genesis, soil physics, soil conservation, soil microbiology, soil chemistry, and soil fertility. Students will gain a basic understanding of soils and their importance and relevance in their program of study. Students will develop an understanding of the role that soils play in the agricultural and economic situation in South Africa and the world. Students will develop an appreciation of soils as a natural resource for South Africa and for the world.		
Module code: CSPM 212	Semester 1	
Title: Soil fertility and fertilizers		
Module outcomes: Ability to read and interpret soil and/or plant analysis results; Be economically and environmentally sensitive to fertilizer and organic wastes use in crop production.		
Module code: PCPM 124	Semester 4	
Title: Introduction to Crop Production		
Module outcomes: Learners will be able to appreciate how plants are in our everyday lives; Know the objectives of crop production systems; Make basic fertilizer calculations; Identify fertilizers, pesticides, common weeds, and farm implements		
Module code: PCPM 321	Semester 4	
Title: Agronomy: Winter Crops		
Module outcomes: For each of the prescribed winter crops, learners will be able to know it's origin, morphology, distribution, climatic and soil requirements; Know it's appropriate cultural practices including irrigation, fertilization and crop; protection measures; conduct yield estimates; identify associated pests and diseases. Identify common cultivars.		
Module code: PCPM 311	Semester 5	
Title: Agronomy: Summer Crops		
Module outcomes: For each of the prescribed summer crops, learner will be able to know it's origin, morphology, distribution, climatic and soil requirements; know it's appropriate cultural practices including fertilization and crop protection measures; conduct yield estimates; identify associated pests and diseases; identify common cultivars.		
Module code: PSSM 312	Semester 5	
Title: Project and Seminar I		
Module outcomes: Ability to prepare and submit project proposal; a critic of literature on a topic to		

submitted; ability to present a seminar.		
Module code: PSSM 321	Semester 6	
Title: Project and Seminar II		
Module outcomes: Learners will demonstrate ability to conduct and manage research under supervision; Ability to analyse, interpret and compile research data; Ability to communicate research results orally in a seminar.		
Module code: PSSM 322	Semester 6	
Title: Principles of irrigation		
Module outcomes: Learners will be able to select an appropriate irrigation system for a given situation, calculate the water requirement for irrigation, and design a simple irrigation system, able to conduct a simple evaluation of an existing irrigation system.		
Module code: PSSM 323	Semester 6	
Title: Soil Conservation		
Module outcomes: Learners will be able to appreciate, identify and assess different stages and forms of natural resources degradation and their causes; design appropriate natural resources management strategies; appreciate the role of Government and NGOs in soil conservation.		

MA.2.10 BIOLOGY

OLD CODE BIO 106			
NEW CODE BIYM 111	CREDITS 12	SEMESTER 1	
Title: Elements of human anatomy			
Module outcomes: This module provides students with the basic information on the physical construction and functioning of the human body. At the end of this module, the student will have the ability to identify and locate the various body structures and demonstrate understanding of various body organ systems and their functions. The following topics are covered: Organization of human body, skeletal system, muscular system, cardiovascular and lymphatic system, respiratory system and digestive system.			
OLD CODE BIO 116			
NEW CODE BIYM 112	CREDITS 12	SEMESTER 1	
Title: Elements of human physiology			
Module outcomes: This module provides students with information on the various physiological processes and related phenomena in the human body as well as understanding of basic principles governing such processes and physiological changes. At the end of this module, students will have the ability to demonstrate understanding of the concept of homeostasis and its controls. Collect, interpret and communicate physiological data. Demonstrate understanding of the functioning of body systems and the principles governing them. The following topics are covered: Physiological processes in respect of skeletal, muscular, cardio-vascular, lymphatic and respiratory systems. Blood cell activities, antigen-antibody reactions, immunity, blood clotting and blood groups. Blood tests and their applications to nursing art and skills. Homeostasis and abnormalities.			
OLD CODE BIO 124			
NEW CODE BIYM 114	CREDITS 12	SEMESTER 1	
Title: Introduction to microbiology			
Module outcomes: This module provides students with basic information on the nature of micro-organisms, their growth and control, as well as awareness of their pathogenicity in humans. At the end			

of this module, students will have the ability demonstrate the understanding of microbial growth and control, to identify and communicate symptoms of viral/bacterial infections and demonstrate understanding of basic principles of anti-microbial/ antibiotic mode of action in man. The following topics are covered, a brief historical perspective; generalized viral and bacterial structures. Culture of bacteria and control of microbes by means of physical, chemical and antibiotic (anti-microbial) agents, viral replication and a few viral diseases. A select few bacterial infections.

OLD CODE BIO 156

NEW CODE BIYM 121

CREDITS 12

SEMESTER 2

Title: **Human anatomical systems**

Module outcomes:

This module provides students with knowledge and information on histological and functional aspects of vital body tissues and organs systems in relation to irritability, growth, metabolism and reproduction. At the end of this module, students will have the ability to demonstrate understanding of the structure and functioning of different tissue and organ systems. To recognize and relate different systems to various physiological body responses. The following topics are covered, Nervous system, endocrine system, reproductive system, integumentary system, urinary system and digestive system.

OLD CODE BIO 165

NEW CODE BIYM 122

CREDITS 12

SEMESTER 2

Title: **Applied biochemistry**

Module outcomes:

This module provides students with a broad based knowledge of the body chemistry, as well as co-ordination of various biochemical processes required in the maintenance of a stable internal environment-homeostasis. At the end of this module students will have the ability to demonstrate understanding and interpretation of basic rules of metabolism, ability to identify and analyse various factors that might influence normal functioning of the body. Application of basic knowledge in explaining abnormalities that might be associated with hereditary phenomena. The following topics are covered, atoms and molecules as chemical basis of life, basic principles of chemical reactions, bio-molecules and their metabolism, enzymes and their functioning. Homeostasis and its control mechanism.

OLD CODE BIO 166

NEW CODE BIYM 124

CREDITS 12

SEMESTER 2

Title: **Systems physiology**

Module outcomes:

This module provides students with the in-depth knowledge and understanding of normal and abnormal bodily structure and functions. At the end of this module students will have the ability to demonstrate understanding of the general structure and function of a number of bodily systems, interpret and communicate the coordinated physiological functions of the major organ systems, recognize and explain some abnormalities pertaining to organ systems. The following topics are covered, Physiology of the major systems of the body; digestive, urinary, reproductive, mental and endocrine systems. Sense organs, metabolism, homeostasis and its central mechanisms and a few abnormalities pertaining to these systems.

CODE SFBM 113

CREDITS 12

SEMESTER 1

Title: **Introduction to cell biology**

Module outcomes:

This module introduces the learners to the basic concepts of cell biology. At the end of this module students will demonstrate knowledge and understanding of basic concepts in cell biology and be able to differentiate between different cell types. Students must also be able to explain the process through which cells multiply and their basic concepts of genetic inheritance. The following topics are covered, characteristics of living organisms, introduction to the study of cells, types of cells, cell organelles, structure and functions, transport of materials across membranes and cell division.

CODE SFBM 123	CREDITS 12	SEMESTER 1	
Title: Introduction to biological concepts			
Module outcomes: This module provides learners with basic information of biological concepts. At the end of this module students will demonstrate understanding of the origin of life and the chemistry of biology. Students must also be able to explain the processes such as photosynthesis, metabolism, cellular respiration, osmoregulation and reproduction. The following topics are covered, Atoms, molecules and compounds of importance to life, alcoholic fermentation, osmoregulation and reproduction, basic microbiology and principles of ecology.			
OLD CODE BGY 103 NEW CODE BIYM 113	CREDITS 12	SEMESTER 1	
Title: Introductory biology			
Module outcomes: This module provides students with a solid, broad-based foundation in modern animal and plant biology as well as skills, knowledge and attitudes to understand major issues of organismal biology. At the end of this module students will demonstrate understanding and the interpretation of structure-function relationship at organismal levels. Demonstrate understanding of the basic evolutionary concepts and process. Ability to apply evolutionary principles in the explanation of the concept of unity in diversity. Comprehend morphological and physiological aspects of major animal and plant groups. The following topics are covered, the cell structure and function, the overview of the cell theory and continuity of life, basic plant / animal design; a morphological perspective, reproduction and development biology, basic concept and principles of plant and animal taxonomy and diversity.			
BGYM 123	CREDITS 12	SEMESTER 2	
Title: Plant systematics and Lower invertebrates			
Module outcomes: This module provides students with an introduction to classification using evolutionary features, structural relatedness and genetic relatedness. At the end of this module students will be able to discuss basic components of taxonomy and linnaius hierarchies of classification and the basic principles of nomenclature. Demonstrate competency in the construction of dichotomous keys, explain the diagnostic characteristics of selected plant and animal taxa and to identify these using dichotomous keys. Explain the concept of biodiversity in terms of evolutionary processes and relationships. Discuss the challenges related to terrestrial mode of life with reference to structural adaptations of selected taxa, elaborate on the effects of human activities impacting negatively on the environment. Discuss the relevance of Taxonomy to management of natural resources or Nature Reserves. The following topics are covered, principles of Taxonomy and species concept, overview of speciation and classification systems and overview of phylogenetics and systematics relationships.			
BGYM 213	CREDITS 8	SEMESTER 1	
Title: Introductory genetics			
Module outcomes: This module provides a broad foundation for the understanding of basic concepts and principles of genetics as well as a solid background for Molecular Genetics. At the end of this module students will be able to identify and analyse the various factors that influence normal functioning of the human body and to understand the structure of the chromosome. Ability to discuss DNA structure and its chemical composition. To understand the origin and transmission of genetic information and understand the application of Mendel's principles of inheritance with respect to living organisms. To understand the chromosomal theory of inheritance. The following topics are covered, a brief overview of genetics and molecular genetics, chromosomal structure and function, structure of DNA and its replication, mendelian genetics, incomplete dominance, inheritance, multiple alleles and gene linkage and chromosome mapping.			

BGYM 214	CREDITS 8	SEMESTER I	
Title: Bacteriology and Microbial ecology			
Module outcomes: This module provides an understanding of fundamental theoretical aspects of bacteriology, microbial ecology as well as an introduction to mycology. At the end of this module students will be able to classify selected bacterial and fungal groups. To explain and apply basic techniques for isolation, identification and handling of bacteria and fungi in the laboratory. To be able to identify selected pathogenic bacterial and fungal forms. The following topics are covered, a brief historical perspective, generalized bacterial structure (ultra structure), growth, cultivation and ways of limiting microbial growth (control) including antibiotics and antibiograms. Viruses and viral replications, few examples of viral infections in man and selected examples of anaerobes. Skin and wound infections. Sexually transmitted diseases, Microbial pollution of water and introductory mycology.			
OLD CODE BGY 214	CREDITS 8	SEMESTER 1	
NEW CODE BGYM (211)			
216			
Title: Elements of Ecology and Biostatistics I			
Module outcomes: This module provides students with the basic concepts of an ecosystem as an ecological unit and how it functions and to introduce them to the qualitative treatment of biological data. At the end of this module students will have the understanding of the interrelationship of the sub-components of an ecosystem also the understanding of energy flow in an ecosystem and the ability to demonstrate understanding of basic bio-statistical information. The following topics are covered, definitions of ecosystem, interrelationships, populations, communities, ecosystems. Ecological problem; pollution, greenhouse effect, population dynamics, introduction to quantitative treatment of biological data and nature of biological variation.			
NEW CODE BGYM 215	CREDITS 12	SEMESTER 1	
Title: Elements of cell biology and Biochemistry			
Module outcomes: This module promotes advanced understanding of the cell as a fundamental unit of life, as well as concepts of cell differentiation. At the end of this module students must be familiar with the use and working of the light microscope and be competent in the understanding of the architectural and functional aspects of different types of cells. Students must have the knowledge and understanding of biomolecules, their classification and nomenclature and be able to demonstrate understanding of basic rules of metabolism as basic kinetic and mechanisms of enzyme action. The following topics are covered, review of prokaryotic and eukaryotic cells as well as light and electron microscopy, structural and functional aspects of eukaryotic cell organelles. Elements of cell biochemistry: biomolecules and their metabolism; enzymes and principles of enzyme kinetics. History of cell biology and cell architecture.			
CODE BGYM 225	CREDITS 8	SEMESTER 2	
Title: Immunology and Virology			
Module outcomes: This module introduces the learners to concepts of virology and immunology. At the end of this module students must know the general characteristics of Viruses (basic morphology, nucleic acids, other chemical components and replication), be able to compare and contrast the morphology and chemical composition of plant and animal viruses. Understand the classification and nomenclature of animal and plant viruses using physical, chemical and biological characteristics. Understand the replication of animal and plant viruses and know how bacteriophages were discovered. Know the classification and nomenclature of bacteriophages, understand bacteriophages and animal viruses are cultured. Understand			

the one step growth curve process, understand the concepts of host parasite interaction and understand the basic concepts of specific immunity and the immune response.			
OLD CODE BGY 254 NEW CODE BGYM (221) 227	CREDITS 8	SEMESTER 2	
Title: Molecular genetics			
Module outcomes: This module provides students with the advanced aspects of molecular genetics with regards to the principles of gene expression and inheritance. At the end of this module students must have an understanding and interpretation of gene expression, competency in the interpretation of gene mutations. Understanding of key topics in contemporary molecular biology and appreciation of the human genetics and inheritance. Students must have an understanding of what chromosomal aberrations are. The following topics are covered, gene expression, the regulation of gene expression, transcription, types of RNA, the genetic code, translation, introduction to population genetics, human inheritance and inborn errors, sex determination and sex linkage, types of gene mutations, tumour cells and carcinogens, polygenic inheritance and blood groups, prenatal and postnatal genetic detections.			
OLD CODE BGY 263 NEW CODE BGYM (222) 314	CREDITS 16	SEMESTER 2	
Title: Applied Microbiology and Microbial Diversity			
Module outcomes: This module introduces the learners to industrial applications of theoretical aspects of microbiology. At the end of this module the student must understand the roles of microorganisms in medicine and pharmaceuticals and the role of microorganisms in the food, agricultural, water and environmental sectors. The following topics are covered, the role of microorganisms in biogeochemical cycles, microorganisms and food spoilage, fermentation processes, Single-Cell Proteins (SCP), sewage treatment and water treatment, environmental cleaning and Bioremediation.			
OLD CODE BGY 273 NEW CODE BGYM (224) 226	CREDITS 8	SEMESTER 2	
Title: Introduction to Entomology and Parasitology			
Module outcomes: This module develops and promotes an awareness of insects and their economic importance to man, it provides an understanding of the classification and systematics of insects and insect parasites. It also provides an understanding of the principles of host parasite relationships and develop an awareness of insects as vectors of diseases. At the end of this module the student must demonstrate the ability to recognize and identify major insect groups of economic importance. Demonstrate the ability to distinguish between beneficial and harmful insect groups and be able to describe the basic principles of host-parasite relationships. The following topics are covered, general characteristics of arthropods with emphasis on insects, basic structure of insects, i.e. external, internal morphology and physiology of all the systems, the economic importance of insects i.e. beneficial insects and harmful insects. The structure of integument and moulting, parasitology – definitions of terms. An introduction of host parasite relationships, parasites and insects as vectors of diseases. General biology and ecology – taxonomy of insects and parasites.			
CODE BGYM (311) 313	CREDITS 16	SEMESTER 1	
Title: Bacterial metabolism			
Module outcomes: This module provides an understanding of advanced aspects of bacterial metabolism. At the end of this module the student must have discussed the major energy yielding sources for microorganisms and be able to explain chemical energy and energy transfer. Must also			

<p>be able to explain generation of ATP by microorganisms (differentiate between substrate-level phosphorylation, oxidative phosphorylation and photo-phosphorylation. Describe how phototrophic organisms convert light energy to chemical energy and describe the major dissilatory pathway called glycolysis. Explain how yeast ferment glucose to ethanol (Differentiate between respiration and fermentation). The following topics are covered, chemical energy and energy transfer, anabolism and catabolism, biochemistry of photosynthesis, respiration and fermentation.</p>			
OLD CODE BGY 314		CREDITS 16	SEMESTER 1
NEW CODE BGYM 311			
Title: Advanced Ecology and Biostatistics II			
<p>Module outcomes: This module provides extended information on ecological principles with particular emphasis on population modelling. It also provides information on techniques in vegetation analysis, as well as awareness of the available software. At the end of this module the student must demonstrate the ability to explain the concept of population structure and modelling and be able to analyse and interpret ecological data statistically. Demonstrate the ability to explain and apply principles of population dynamics in wildlife management. The following topics are covered, population modelling, techniques of vegetation and analysis, population dynamics and wildlife management, community structure, classification and ordination techniques, soils: development, profile, texture, problems of ecosystems. Evaluation and time scales, the biome system: veld types, vegetation types (South Africa). Biostatistics.</p>			
OLD CODE BGY 334		CREDITS 16	SEMESTER 1
NEW CODE BGYM 315			
Title: Systematics			
<p>Module outcomes: This module provides an integrated approach to bio-diversity, as well as skills and understanding of evolutionary concepts and principles. At the end of this module students must demonstrate an understanding on the meanings of systematics, taxonomy and phylogenetics, outline the significance of systematics in biodiversity and conservation studies. Elaborate the phylogenetic relationships among taxa based on various systematic data, explain the basic principles of phenetic and cladistic methods of classification. Discuss the applications of systematics in resolving classification conflicts. The following topics are covered, biological aspects of systematics and phylogenetics, speciation and the classification systems, biodiversity, conservation and biogeography.</p>			
OLD CODE BGY 374		CREDITS 16	SEMESTER 2
NEW CODE BGYM 326			
Title: Applied Molecular Genetics			
<p>Module outcomes: This module provides an understanding and appreciation of the roles of recombinant DNA technology in its endeavours and attempts to solve the human social, economic and ethical problems. At the end of this module students will demonstrate the ability to understand the concepts of recombinant DNA technology or biotechnology. Outline the possible benefits of this technology in attempting to solve our day to day problems and discuss the social and ethical issues around this technology. Deduce further possible advancements of this technology for the ultimate benefit of humankind. The following topics are covered, bacterial reproduction, the roles of plasmids in bacteria, recombinant DNA technology, the polymerase chain reaction and genetic markers, gene cloning, protein expression and purification, the human genome and gene sequencing project, potential applications of the recombinant DNA technology, ethical questions about biotechnology.</p>			
OLD CODE BGY 384		CREDITS 16	SEMESTER 2
NEW CODE BGYM 325			
Title: Developmental Biology			
<p>Module outcomes: This module provides an integrated, broad-spectrum understanding of biological principles</p>			

governing organismal growth and development. At the end of this module students will demonstrate an understanding of the stages and processes of development in selected animals. Explain the significance of extra embryonic membranes in placental animals. Discuss the genetic and environmental factors that influence plant growth and development. Outline the various regulatory mechanisms of plant hormones in growth and development. The following topics are covered, overview of processes and stages of plant and animal development, principles of cell division, morphogenesis and differentiation, morphogenesis and biotechnology, the regulatory roles of plant growth hormones, significance of the embryonic membranes to terrestrial animals.

MA.2.11 CHEMISTRY

Module code: MCHE114	Semester 1	
Title: Introductory Chemistry I		
Module outcomes:		
Knowledge:		
Students should acquire knowledge of the topics covered, particles, Periodic table, elements, compounds, mixtures, the mole and molar quantities, balancing equations including acid-base and redox reactions and calculations based on balanced equations and concentrations, atomic structure, nuclear reactions and radioactivity, chemical bonding.		
Skills:		
Students should be able to recall and use the relevant intellectual skills and strategies for learning and applying chemical knowledge, recall the most important fundamental principles, concepts, facts and applications of chemistry, apply in a logical manner the principles, concepts and facts of chemistry to solve chemical problems. Use science and technology effectively and critically, showing responsibility towards the environment and health of others. In practical sessions students use the basic practical skills needed for carrying out chemistry practices, analyse simple substances to identify them and find their composition, measure, collect, analyse and present data.		
Module code: MCHE121	Semester 2	
Title: Introductory Chemistry II		
Module outcomes:		
Knowledge:		
Students should acquire knowledge of the topics covered, Physical/Inorganic chemistry: Chemical bonding including covalent bonding theories, molecular structure, chemical equilibria, acids and bases, buffer solutions, solubility products. Organic chemistry: types of organic reactions, organic acids and bases, non-aromatic hydrocarbons, functional groups, polymer chemistry.		
Skills:		
Students should be able to recall and use the relevant intellectual skills and strategies for learning and applying chemical knowledge, recall the most important fundamental principles, concepts, facts and applications of chemistry. Apply in a logical manner, the principles, concepts and facts of chemistry to solve chemical problems. Use science and technology effectively and critically showing responsibility towards the environment and health of others. In practical sessions students use the basic practical skills needed for carrying out chemistry practices, analyse simple substances to identify them and find their composition, measure, collect, analyse and present data.		
Module code: MCHE215	Semester 1	
Title: Physical Chemistry I		
Module outcomes:		
Knowledge:		
Students should acquire knowledge of the topics covered, chemical equilibria, thermodynamics, kinetics and electrochemistry.		
Skills:		

Students should be able to recall and use relevant intellectual skills and strategies for learning and applying chemical knowledge, recall most important fundamental principles, concepts, facts and applications of chemistry, apply in a logical manner the principles, concepts and facts of chemistry to solve chemical problems, calculate thermodynamic functions by using appropriate equations and values from relevant thermodynamic tables and to interpret thermodynamic values in terms of process properties. Measure and calculate rate constants and activation parameters and interpret these values in terms of reaction mechanisms. In practical sessions students collect, analyse and present data. Handle and use scientific instruments, use various laboratory techniques to determine equilibrium constants, thermodynamic data, rate constants and activation parameters. Make accurate observations and measurements and record them,

Module code: MCHE216

Semester 1

Title: **Inorganic Chemistry I**

Module outcomes:

Knowledge:

Students should acquire knowledge of the topics covered, bonding, main group, transition metal chemistry and their environmental impact.

Skills:

Students should be able to recall and use relevant intellectual skills and strategies for learning and applying chemical knowledge, recall most important fundamental principles, concepts, facts and applications of chemistry, apply in a logical manner the principles, concepts and facts of chemistry to solve chemical problems. In practical sessions students use the basic practical skills needed for carrying out chemistry practices, collect, analyse and present data. Handle and use scientific instruments, handle chemicals and equipment safely in the laboratory.

Module code: MCHE221

Semester 2

Title: **Organic Chemistry I**

Module outcomes:

Knowledge:

Students should acquire knowledge of the topics covered, nomenclature, synthesis, properties, reactions and reaction mechanisms of various functional groups, organic oxygen compounds, organic halogen compounds, aromatic compounds including hetero-aromatics, physical methods for the identification and structure elucidation of organic compounds.

Skills:

Students should be able to recall and use relevant intellectual skills and strategies for learning and applying chemical knowledge, recall most important fundamental principles, concepts, facts and applications of chemistry, apply in a logical manner the principles, concepts and facts of chemistry to solve chemical problems. Write equations and mechanisms for the synthesis and reactions of organic compounds. Draw resonance and chemical structures. In practical sessions students use the basic practical skills needed for carrying out chemistry practicals, collect, analyse and present data. Handle and use scientific instruments, carry out standard organic techniques such as distillation, melting point and boiling points determinations. Handle chemicals and equipment safely in the laboratory.

Module code: MCHE223

Semester 2

Title: **Analytical Chemistry I**

Module outcomes:

Knowledge:

Students should acquire knowledge of the topics covered, sampling and statistical evaluation of data, separation techniques, volumetry, gravimetry and atomic emission and absorption spectroscopic methods.

Skills:

Students should be able to recall and use the relevant intellectual skills and strategies for learning and applying chemical knowledge, recall the most important fundamental principles, concepts, facts and applications of chemistry, apply in a logical manner the principles,

concepts, fact and applications of chemistry to solve chemical problems, explain the underlying principles of sampling and statistical evaluation of data, separation techniques, volumetric and gravimetric methods, explain the theory of atomic spectroscopy. In practical sessions students use the basic practical skills needed for carrying out chemistry practicals, collect, analyse and present data, obtain a representative sample on the basis of given criteria, estimate the reliability of results, separate solutes by crystallization, distillation and solvent extraction, handle and use scientific instruments, handle chemicals and equipment safely in the laboratory.

Module code: MCH315

Semester 1

Title: **Organic Chemistry II**

Module outcomes:

Knowledge:

Students should acquire knowledge of the topics covered, steroids, carbohydrates and lipids, organic nitrogen contain compounds, synthetic polymers, physical methods for the identification and structure elucidation of organic compounds.

Skills:

Students should be able to recall and use the relevant intellectual skills and strategies for learning and applying chemical knowledge, recall the most important principles, concepts, facts and application of organic chemistry, apply in a logical manner the principles, concepts and facts of chemistry to solve chemical problems, name carbonyl and nitrogen containing compounds. Identify and relate the chemical properties to structure. In practical sessions students should be able to synthesize, isolate and identify the chemical and physical properties of various functional groups of oxygen and nitrogen containing organic compounds. Relate the chemical properties to structure, carry out interconversions among various functional groups, handle chemicals and equipment safely in the laboratory

Module code: MCH316

Semester 1

Title: **Analytical Chemistry II**

Module outcomes:

Knowledge:

Students should acquire knowledge of the topics covered, radiochemical methods of analysis, thermal and calorimetric methods, electrochemical methods.

Skills:

Students should be able to recall and use relevant intellectual skills and strategies for learning and applying chemical knowledge, apply in a logical manner the principles, concepts and facts of chemistry to solve chemical problems, explain the underlying principles of radiochemical, thermal and electrochemical methods, appreciate the theoretical basis of the applications of analytical chemistry in various industries. In practical sessions students use the basic practical skills needed for carrying out chemistry practices to collect, analyse and present data, obtain a representative sample on the basis of given criteria, estimate the reliability of results, analyse samples using the various analytical methods, handle and use scientific instruments, handle chemicals and equipment safely in the laboratory.

Module code: MCH321

Semester 2

Title: **Physical Chemistry I**

Module outcomes:

Knowledge:

Students should acquire knowledge of the topics covered, quantum mechanics, molecular spectroscopy, thermodynamics including non-ideal behaviour, kinetics including non-ideal behaviour and complex reaction, surface chemistry.

Skills:

Students should be able to recall and use the relevant intellectual skills and strategies for learning and applying chemical knowledge, recall the principles, concepts, facts and applications of chemistry required in Physical Chemistry, apply in a logical manner the principles, concepts and facts of chemistry to solve chemical problems, perform calculations,

explain and interpret data on thermodynamic functions including non-ideal behaviour, kinetics and complex reactions. Measure and calculate rate constants and activation parameters and interpret these values in terms of reaction mechanisms, interpret molecular spectra. In practical sessions students should be able to collect, analyse and present data, correctly operate scientific instruments, use various laboratory techniques to determine thermodynamic and kinetic data, make accurate observations and measurements and record them, handle chemicals and equipment safely in the laboratory.

Module code: MCHE322

Semester 2

Title: **Inorganic Chemistry II**

Module outcomes:

Knowledge:

Students should acquire knowledge of the topics covered, coordination compounds in octahedral, tetrahedral and square planar stereochemistries. Bonding and properties of the coordination compounds.

Skills:

Students should be able to recall and use the relevant intellectual skills and strategies for learning and applying chemical knowledge, recall the principles, concepts, facts and applications of chemistry required in Inorganic Chemistry, apply in a logical manner the principles, concepts and facts of chemistry to solve chemical problems, explain properties of coordination compounds, compare and contrast the various bonding theories. In practical sessions students will use the practical skills needed for carrying out chemistry practicals to collect, analyse and present data, synthesise, isolate, wash, hand dry coordination compounds. Use scientific instruments to run UV-visible and IR spectra, handle chemicals and equipment safely in the laboratory.

MA.2.12 BIOCHEMISTRY

Code: BCHS 211

Semester 1

CREDITS 8

NQF LEVEL 6

Title: **Introduction to Biochemistry**

Purpose:

To outline the structural and molecular chemistry of water, carbohydrates, amino acids, proteins and nucleic acids in preparation for studies in metabolic processes courses.

Code: BCHS 212

Semester 1

CREDITS 8

NQF LEVEL 6

Title: **Introduction to Enzymology**

Purpose:

To give an overview of the major characteristics and properties of enzymes. To describe the various mechanisms of enzyme reactions and enzyme kinetics. To explain the regulatory mechanisms of enzyme activity.

Code: BCHS 221

Semester 2

CREDITS 8

NQF LEVEL 6

Title: **Metabolic Processes I**

Purpose:

To explain the modern concepts in bioenergetics (biological oxidation and oxidative phosphorylation). To outline the process of carbohydrate metabolism and its regulation (glycolysis, citric acid cycle, pentose phosphate pathway, gluconogenesis, glycogen degradation and synthesis). To describe lipid metabolism and its regulation (degradation and synthesis of glycerol and fatty acids).

Code: BCHS 222

Semester 2

CREDITS 8

NQF LEVEL 6

Title: **Metabolic Processes II**

Purpose:

To describe the processes of ketone body formation and metabolism of cholesterol and steroids. To demonstrate an understanding of amino acid metabolism and their conversion to specialized products. To outline the processes of nucleic acid metabolism and protein synthesis. To give a general outline on the concept of regulation and integration of metabolism.

Code: BCHS 314	Semester 1	CREDITS 16	NQF LEVEL 6
Title: Molecular and Cell Biology			
Purpose: To give an overview on the role of molecular and cell biology across the range of modern biology. To describe the molecular anatomy of genes and chromosomes. To describe the global structure of chromosomes and explain chromosomal packaging and replication. To outline the processes of cell cycle, cell signaling, cell aging and cell death, and their modes of genetic regulation. To provide a broad overview on the molecular biology of cell cancer and its impact on human health.			
Code: BCHS 315	Semester 1	CREDITS 16	NQF LEVEL 6
Title: Advanced Biochemistry and Molecular Physiology			
Purpose: To give an account on the advanced aspects of the mechanisms of enzyme action, and the expression and transmission of genetic information. To outline the biochemical and molecular physiology of muscle contraction, neuron transmission and hormone action.			
Code: BCHS 324	Semester 2	CREDITS 16	NQF LEVEL 6
Title: Analytical Biochemistry			
Purpose: To state and explain the various practical techniques used in biochemical research systems as well as explaining the different terminologies of a practicing biochemist. To demonstrate a broad understanding of the principles and concepts behind the biochemical processes of pH measurement, bio-molecule extraction and technical determination of molecular structures. To demonstrate a vivid technical competence in the usage and application of practical techniques like centrifugation, chromatography, electrophoresis, spectrophotometry, crystallography, radioisotope and immunoassay.			
Code: BCHS 325	Semester 2	CREDITS 16	NQF LEVEL 6
Title: Project			
Purpose: To develop ability to read and use scientific literature with understanding addressing content, context, aims and objectives of information. To develop ability to evaluate, interpret complex scientific ideas and apply information from a variety of sources. To develop an ability to assess the value and limitations of existing knowledge and experimental techniques. To nature ability to use and integrate several lines of evidence to formulate key hypotheses, to test hypotheses using logical and consistent quantitative and qualitative arguments, and to identify key data in these processes and develop skills of independent learning.			

MA.2.13 MICROBIOLOGY

Code: MKBS 211	Semester 1	CREDITS 8	NQF LEVEL 6
Title: Introduction to Microbiology			
Module outcomes: Students should be able to understand the history and scope of microbiology. The essential biochemistry for microbiology. The microbial structure: microscopy and specimen preparation. The Characterization of microorganisms. The cell structure and function of Prokaryotes and Eukaryotes. The Nutritional requirements of microbiological media. The Control of microorganisms by physical and chemical agents			
Code: MKBS 212	Semester 1	CREDITS 8	NQF LEVEL 6
Title: Introduction to Microbial Genetics			
Module outcomes: Students should know the gene structure, replication and gene expression. The regulation of gene expression and the mechanisms of genetic variation. The role of microbes in genetic engineering.			

Code: MKBS 222	Semester 2	CREDITS 8	NQF LEVEL 6
Title: Microbial Diversity and Physiology (Bacteria, Fungi)			
Module outcomes: Students should be able to demonstrate understanding of microbial Evolution, Taxonomy and Diversity. Major groups of eukaryotic microorganisms – fungi, algae, protists. Major groups of prokaryotic microorganisms – bacteria, Microbial metabolism, nutrition, culture and growth.			
Code: MKBS 223	Semester 2	CREDITS 8	NQF LEVEL 6
Title: Introduction to Recombinant DNA Technology and Bioinformatics			
Module outcomes: The learner will be knowledgeable about the historical perspective of the Recombinant DNA Technology. Bacterial chromosomes and plasmids. Genetic exchange in prokaryotes (genetic recombination, transformation, transduction, conjugation, formation of Hfr strains, complementation gene transfer and transposable elements). Genetic engineering: tools and techniques e.g. molecular cloning, sequencing, PCR, Nucleic Acid hybridization and Southern blot, plasmids as cloning vectors etc. Microbial genomics. Prokaryotic genomes: bioinformatics.			
CODE: MKBS 316	Semester 1	CREDITS 16	NQF LEVEL 6
Title: Microbial Ecology			
Module outcomes: Students should understand and know the concepts of microbial ecology including. Biogeochemical cycles (nutrient cycles) and the role of microbes thereof. Microorganisms in marine, freshwater and terrestrial environments. Microbial interactions and methods to measure microbial activity in nature			
CODE: MKBS 317	Semester 1	CREDITS 16	NQF LEVEL 6
Title: Environmental Microbiology and Public Health			
Module outcomes: The learner will be able to know major products of Industrial pollution (water and air). Major microorganisms responsible for biodegradation and bioremediation. Wastewater microbiology, treatment, purification and sanitary analysis. Waterborne and airborne diseases and their epidemiology			
CODE: MKBS 326	Semester 2	CREDITS 16	NQF LEVEL 6
Title: Industrial Microbiology and Biotechnology			
Module outcomes: Students should understand and know the following processes, Food preservation and microbial growth. Microbial sampling and food poisoning. Single cell proteins as source of food. Principles of fermentation technology. Products from genetic engineering. Transgenic organisms. Biotechnology and (the), Pharmaceuticals, Microorganisms in bioterrorism, Microorganisms as pesticides, Nanotechnology and Biochemistry of bioremediation.			
CODE: MKBS 327	Semester 2	CREDITS 16	NQF LEVEL 6
Title: Virology and Immunology			
Module outcomes: Students must know (the) early Development of Virology. Classification of Bacterial and Archaeal Viruses. Taxonomy of Eucaryotic viruses. General properties of bacteriophages/viruses including their cultivation. Reproduction of Bacterial and Vertebrate Viruses. Constructing a Virus. Cytocidal Infections and cell damage. Persistent, Latent and slow virus infections with selected examples. Vector-borne and soil borne microbial diseases. Essentials of immunology. Immunology in host defence and disease. Molecular immunology.			

MA.2.14 COMPUTER SCIENCE

New code: CISM 111	Semester 2	
Title: Introduction to Computing		
Content Programming language characteristics, integrated development environments, flowcharts, algorithms and pseudocode, variables, operators, conditional statements, looping statements, procedures, error-handling and debugging, object-oriented programming techniques, user interface design, software modeling , introduction to VB.net and /or C#		
Outcomes: Describe the main components of a computer and the role that different kinds of programming language play in computer software development. Build simple logic gates and functional hardware. Apply problem solving skills to develop algorithms that solve small to medium sized computational problems. Appreciate simple machine architecture and programme execution using Assembling language. Understand and write simple programmes using Java language.		
New code: CISM 122	Semester 2	
Title: Programming and Problem Solving		
Content: Procedural programming in C++. Structured data types. Sorting. Searching. Recursion. Program testing. Program documentation. Introduction to object oriented programming		
Outcomes: Write fundamental data types to implement solution. Design algorithms to solve problems. Build programs using modular-design and modular programming. Compile, find and fix errors in programs in order to execute programs. Describe object-oriented programming. Technical skills, personal skills and social skills.		
New code: CISM 123	Semester 2	
Title: Programming practicals		
Content: Fundamental programming constructs, algorithms and problem solving, data structures, functions, recursion, event-driven programming and object-oriented programming.		
Outcomes: Write, debug, and document well-structured C++ applications, implement C++ classes from specifications. Understand the behavior of primitive data types, object references, and arrays, usage of decision and iteration control structures to implement algorithms. Write simple recursive algorithms. Use interfaces, inheritance, and polymorphism as programming techniques. Use exceptions.		
New code: CISM 124	Semester 2	
Title: End-user Computing		
Content: Introduction to computers, operating systems and application packages. Word processing including LATEX, equations tables, footnotes indexes and references. Spreadsheets including layout, formatting functions, graphs, importing data and exporting data. Presentation software including templates, screen design and presentation techniques, e-mail The internet: Networking utilities such as ftp, telnet, smtp. Specialized packages such as PSPICE, MATLAB , ORIGIN (for plotting scientific graphs).		
Outcomes: Explain and identify methods for achieving productivity in the workplace. Use appropriate computer tools (Hardware and software) to solve problems and work efficiently and effective. Develop an HCI. Technical skills, personal skills and social skills.		
New code: CISM 211	Semester 2	
Title: Algorithmic Design and Data Structures		
Content: Basic algorithm analysis, algorithm strategies, fundamental computing algorithms, distributed		

algorithms, graphs and trees, fundamental data structures and recursion.		
Outcomes:		
Describe and explain algorithms concepts and methods. Define, explain and apply problem solving using algorithms. Develop computing solutions for the algorithms using a programming language. Create and manipulate static data structures and dynamic data structures. Develop methods for traversal of trees.		
New code: CISM 212	Semester 2	
Title: Imperative and Object-Oriented Languages		
Content:		
Overview of programming languages, virtual machines, introduction to language translation.		
New code: CISM 223	Semester 2	
Title: Architecture and operating systems		
Content:		
Digital logic and digital systems, machine level representation of data, assembly level machine organisation, memory system management, interfacing and communication, functional organisation multiprocessing and alternative architecture, performance enhancements, overview of operating systems, operating systems principles, concurrency, scheduling and dispatch, and memory management.		
Outcomes:		
At the end of this module the learner must be able to fully explain the basic PC hardware building components. Appraise an instruction set architecture; Distinguish between an architecture and its implementation; Master basics of Machine level programming. Master the basics of operating systems including PC resources management, paging etc.		
New code: CISM 224	Semester 2	
Title: Introduction to Software Engineering		
Content:		
Software design, software tools and environments, software processes, software requirements and specifications, software validation, software evolution and software project management.		
Outcomes:		
Describe software engineering and its process. Describe and apply different software development methodologies to solve problems. Implement a solution using the appropriate software development methodology. Develop and validate a basic system using a DBMS using software requirements and specifications. Write software engineering documentation such as reports, and user manuals. Technical skills, personal skills and social skill.		
New code: CISM 311	Semester 2	
Title: Introduction to Database Systems		
Content:		
Information models and systems, database systems, data modelling, relational database, database query languages and relational database design. Database Management Systems; DBMS storage structures. Relational algebra and relational calculus; SQL; query optimisation; views. Database Design: UML Class Diagrams and Entity-Relationship Diagrams; UML Sequence Diagrams; conceptual, logical and physical database design.		
Outcomes:		
Describe nature and scope of database system. Explain and apply information models and systems to address everyday problems. Describe and explain data modelling concepts and techniques. Design a relational database. Develop a DBMS and manipulate it using a data manipulation language. Technical skills, personal skills and social skills.		
New code: CISM 312	Semester 2	
Title: Theory of Computation and Translation		
Content:		
Basic computability, automata theory, Turing machines, advanced algorithmic analysis, parallel algorithms, and introduction to language translation.		
Outcomes:		

Describe the nature and scope of computational theory in a computer science environment. Write advanced algorithms to solve problems in computing. Describe and explain automata theory and its application to computing. Translate advanced algorithms to machine language.		
New code: CISM 323	Semester 2	
Title: Net-Centric Computing		
Content: Introduction to net-centric computing, Basics of networking architecture, Application layer protocols, including HTTP. Naming, including domain name system. Transport protocols, including TCP.. network security, the web as an example of client-server computing, building web applications, and network management.		
Outcomes: Describe and explain the different network components and their uses (importance). Describe, explain and differentiate telecommunications technologies. Install, configure and maintain network. Develop web applications. Describe and explain the social issues of networks and ways of dealing with them. Technical skills, personal skills and social skills.		
New code: CISM 324	Semester 2	
Title: Artificial Intelligence Fundamentals		
Content: Fundamental issues in intelligent systems, search and constraint satisfaction, knowledge representation and reasoning, advanced search, advanced knowledge representation and reasoning.		
Outcomes: Describe and explain the nature and scope of artificial intelligence. Describe fundamental issues in intelligent systems. Design patterns for searching and apply searching and constraints satisfaction to draw inferences and conclusions. Design patterns for application of knowledge representation and reasoning. Describe different artificial intelligence applications.		
New code: CISM 325	Semester 2	
Title: Graphics		
Content: The course aims to cover, Software and hardware for interactive computer graphics. Implementation of device drivers, 3-D transformations, clipping, perspective, and input routines. Data structures, hidden surface removal, colour shading techniques, and some additional topics will be covered.		
Outcomes: Write interactive 3D computer graphics programs; Understand how linear and perspective transformations are used in modeling and rendering in 3D computer graphics; Understand the process of rendering, lighting, hidden surface removal, and other computer graphics techniques; Write a simple ray tracer.		

MA.2.15 GEOGRAPHY

Module code: GEOM 113	Semester 1	
Title: Introduction to Physical Geography		
Module outcomes:		
Theory: Upon completion of this module the students should be able to describe the nature and material content of physical geography, and identify the tools and approaches that geographers use to study the Earth. Explain the role of physical geography in understanding global change e.g. climate change. Display sound knowledge of the major physical processes in the area of climatology, geomorphology, soils, and biogeography and explain their geographical distribution on the Earth's surface. Explain how the atmospheric, geomorphological and biogeographical processes act in varied global environments. Understand the interactions between the various physical processes and systems that act on		

the earth's surface. Assess the contribution that physical geography can make to contemporary environmental issues. Use and apply field and laboratory techniques that are fundamental to geographical enquiry. Apply qualitative and quantitative data analysis techniques used by physical geographers to explore and model the phenomena they observe.

Practical:

Upon completion of this module the student should be able to list all the map and marginal information contained in topographical maps. Explain the basic principles of cartography and draw maps of acceptable cartographic standard. Read and interpret conventional signs and other map symbols used on South African topographical maps. Apply appropriate mapwork skills to identify, locate, measure, and analyse features on the map. Apply quantitative mapwork skills in the analysis of topographical map. Recognise and interpret physical landscape and identify typical landforms on topographical maps.

Module code: GEOM 123

Semester 2

Title: **Introduction to Human Geography**

Module outcomes:

Theory:

Upon completion of this module the students should be able to describe the approaches and methods used in human geography as a field of enquiry. Discuss culture and cultural diffusion, including analysis of artifacts, institutions and values. Explain the variable distribution of population, and examine the processes of population change. Identify the four sectors of the economy and discuss the global patterns of agricultural production.

Practical:

Upon completion of this module the student should be able to recognise and interpret cultural landscape on topographical maps. Analyse spatial relationships between physical and cultural phenomena and elucidate significant spatial patterns. Combine reading and interpretation of map to build a geographical analysis about the area covered by the map. Describe essential GIS principles, and apply these principles to analyse spatial data and make locational decisions. Locate different countries and physical features on both political and physical world map.

Module code: GEOM 214

Semester 1

Title: **Human Geography**

Module outcomes:

Upon completion of this module the students should be able to describe and discuss the geographical factors which explain the evolution of South African cities. Apply this knowledge to explain the local environment, in particular the spatial development of Mafikeng. Discuss critically theoretical land use models and their applicability to the South African context. Apply this knowledge to explain the contemporary debates on the physical growth of cities and land use change in the urban fringe. Discuss the importance of land tenure systems in the explanation of urban and rural development. Apply this knowledge to help explain the problems inherent in land reform in Southern Africa.

Module code: GEOM 215

Semester 1

Title: **Geographical Statistics and Computers**

Module outcomes:

Theory:

Upon completion of this module the students should be able to explain and interpret spatial concepts. Apply geographically related software programmes to geographical problems. Apply statistical techniques used in geography and Environmental Sciences.

Practical:

Upon completion of this module the student should be able to use computer programmes such as MS Explorer, MS Word and MS Excel. Demonstrate practical use of a hand held GPS. Use geographically related software programmes. Calculate measures of central tendency. Calculate deviation and correlation using statistical methods.

Module code: GEOM 224

Semester 2

Title: **Physical Geography**

Module outcomes:		
Theory:		
Upon completion of this module the students should be able to describe and explain the processes that are taking place on the earth's surface. Account for the formation and destruction of landforms. Explain the basic processes of geomorphology, weathering and soil erosion. Describe and distinguish between the different geomorphological processes: fluvial geomorphology, glacial geomorphology, periglacial geomorphology, coastal geomorphology and aolian and arid geomorphology.		
Module code: GEOM 225	Semester 2	
Title: Aerial photography and remote sensing		
Module outcomes:		
Theory:		
Upon completion of this module the students should be able to apply appropriate techniques of air photo interpretation and satellite imagery. Apply the principles of remote sensing and air photo interpretation.		
Practical:		
Upon completion of this module the students should be able to use and apply appropriate techniques of air photo interpretation.		
Module code: GEOM 316	Semester 1	
Title: Advanced human geography		
Module outcomes:		
Theory:		
Upon completion of this module the students should be able to describe and discuss the problems of urbanisation in the third world. Critically discuss development planning, urban trends and urban policies and debates in South Africa. Describe development and urbanization in a world system.		
Practical:		
Upon completion of this module the students should be able to determine the criteria and justifications for boundary delimitation. Apply relevant methods of delimiting geographical boundaries.		
Module code: GEOM 317	Semester 1	
Title: Advanced physical geography		
Module outcomes:		
Theory:		
Upon completion of this module the students should be able to describe and explain the different processes acting on the earth's environmental problems. Critically evaluate the current debates in the field of applied climatology. Describe and explain the circulation patterns and weather producing processes over Southern Africa. Describe and explain weathering, slope processes, erosion, Aeolian and arid geomorphology. Describe and discuss climate change, weather forecasting, weather modification and man-made climates. Apply debates on climate and human comfort. Describe atmospheric circulation and weather over Southern Africa.		
Practical:		
Upon completion of this module the students should be able to use skills and field techniques in the interpretation of synoptic weather maps and weather forecasting. Use techniques of slope measurement, drainage basin analysis, particle shape analysis, particle size analysis, Atterberg limits and rock properties.		
Module code: GEOM 328	Semester 2	
Title: Geographical Information Systems (GIS)		
Module outcomes:		
Theory:		
Upon completion of this module the students should be able to explain The development, concepts, uses and applications of GIS. Outline the history of GIS.		
Practical:		

Upon completion of this module the students should be able to use GIS techniques to model spatial data. Apply data and coordinate systems. Use different projections and georeferencing systems. Use GIS data sources and metadata. Use ArcGIS software for map design.

Module code: GEOM 329

Semester 2

Title: The Geography of African Development

Module outcomes:

Upon completion of this module the students should be able to describe and discuss the geographical factors which explain the evolution of development in Africa. Apply this knowledge to explain the spatial and environmental aspects of development in particular geographical case-studies. Discuss critically theoretical propositions on the development and underdevelopment of Africa, and the applicability of these theories to the South African context. Describe and discuss the variability of African environments and the coping strategies which vulnerable groups adopt as mitigating environmental change and apply geographical perspectives to the possible resolution of development problems in Africa.

MA.2.16 ELECTRONICS

Module code: ELYM115

Semester 1

Title: Electricity, Magnetism and Circuits

Module outcomes:

The learner should be able to recall the fundamental principles, concepts, facts and applications of Electricity and Magnetism. Demonstrate understanding and application of electric and magnetic field quantities, Maxwell's equations and electromagnetic waves. Demonstrate understanding and application of basic concepts in AC and DC circuit analysis. Demonstrate a hands-on ability to utilise basic electronic equipment with respect to measurement and interpretation of electronic data.

Module code: ELYM127

Semester 2

Title: Introduction to Electronics

Module outcomes:

The learner should be able to demonstrate an understanding of the basics and applications of active devices, basic logic concepts and gates. Demonstrate an understanding of circuit theorems, and their application in the analysis of alternating and direct current circuits. Demonstrate a hands-on ability to utilise basic electronic equipment with for measurement and interpretation of electronic data.

Module code: ELYM215

Semester 1

Title: Analogue Electronics and Ysystems

Module outcomes:

The learner should be able to, demonstrate an understanding of transistor characteristics, transistor biasing and amplifier DC and AC equivalents. Demonstrate an understanding of advanced circuit theorems and their application in circuit analysis. Demonstrate an understanding of filters in terms of their transfer functions. Demonstrate a hands-on ability to apply basic electronic measurement and test equipment and techniques to the measurement and interpretation of electronic quantities in AC and DC circuits and circuits containing some active devices.

Module code: ELYM227

Semester 2

Title: Digital Electronics and Systems

Module outcomes:

The learner should be able to, demonstrate an understanding of basic logic concepts and elements. Apply Boolean algebra and Karnaugh map techniques to logic minimisation and circuit realisation of logic expressions. Demonstrate an understanding of combinational systems such arithmetic circuits, digital building blocks, and memory devices. Demonstrate a hands-on ability to apply basic electronic equipment and techniques to the measurement and interpretation of electronic quantities in Digital Electronics.

Module code: ELYM315	Semester 1	
Title: Advanced Analogue Electronics		
Module outcomes: The learner should be able to, demonstrate an understanding of feedback and its implementation in amplifiers, Operational amplifiers and related circuit configurations, Active Filters and Oscillators, and High Frequency. Demonstrate a hands-on ability to apply electronic test equipment and techniques to the measurement and interpretation of electronic quantities in feedback, operational amplifiers, filters and high frequency .		
Module code: ELYM316	Semester 1	
Title: Introduction to Signals and Systems		
Module outcomes: The learner should be able to demonstrate an understanding of Signals and Systems and Linear Time-Invariant Systems in particular. Apply Fourier, Laplace and z-transform techniques in the design and analysis of discrete-time and continuous-time LTI systems. Demonstrate an understanding of filtering, signal sampling and reconstruction.		
Module code: ELYM327	Semester 2	
Title: Advanced Digital Techniques and Systems		
Module outcomes: The learner should be able to demonstrate an understanding of advanced logic concepts and techniques, interconnection of logic elements to form logic circuits, circuit reduction techniques for logic circuits, interfacing of CMOS and TTL devices, and digital to analogue and analogue to digital conversion. Demonstrate a hands-on ability to apply basic electronic test gear and techniques to the measurement and interpretation of electronic quantities in advanced digital electronics. Demonstrate familiarity with the characteristics of common integrated circuit chips.		
Module code: ELYM328	Semester 2	
Title: Introduction to Microcontroller Systems		
Module outcomes: The learner should be able to describe the differentiating factors between micro-processors and micro-controllers in general. Appreciate the circumstances for preferences between the two. Design and program simple systems based on a micro-controller.		

MATHEMATICAL SCIENCES

MA.2.17 APPLIED MATHEMATICS

Module code: APMM 117	Semester 1	
Title: Introduction to Mechanics		
Module Outcomes: To show knowledge of vector algebra and to demonstrate the ability to use vector analysis to solve problems. To apply the concepts of motion with constant acceleration to various real-life situations. To analyze forces acting on an object and predict their effects on it and should also demonstrate the ability in the drawing of free-body forces, identify situations involving static equilibrium. To demonstrate the ability to apply energy transformations and the concept of power to everyday situations. To demonstrate the ability to describe and apply the concepts of uniform circular motion to real-world situations and to analyze the simple harmonic motion to interpret the result physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs. To interact effectively in a learning group.		
Module code: APMM 127	Semester 1	
Title: Introduction to Numerical Methods and Mathematical Modelling		
Module Outcomes:		

To identify, solve and construct mathematical models process, growth and decay, logistical growth, cooling problems, electrical series circuit, mixture problems, chemical reaction, law of mass action, separable and first-order differential equations and initial conditions. To analyze and demonstrate problems solving skills by interpreting the mathematical problems to the physical problems for the models in 1. To understand and demonstrate principles of numerical methods, errors, interpolation and numerical differentiation and integration. To interpret the result physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs.

Module code: APMM 217

Semester 1

Title: **Mathematical Modelling**

Module outcomes:

To demonstrate knowledge of, formulate simple mathematical models of damped and undamped oscillations, systems of first order ODE's with constant coefficients and linear programming problems. To analyze using basic principles and identify various solution methods for the models. To interpret the result physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs.

Module code: APMM 227

Semester 1

Title: **Differential Equations and Numerical Methods**

Module outcomes:

To identify, distinguish and apply various series solutions second order differential equations with variable coefficients. To identify and use orthogonal systems in Fourier series, Sturm-Liouville problems and Fourier integrals. To identify and use polynomial interpolation, divided differences, LU decomposition, Jacobi and Gauss-Seidel methods. To interpret the result physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs. To interact effectively in a learning group.

Module code: APMM 317

Semester 1

Title: **Mathematical Programming**

Module outcomes:

Demonstrate ability to formulate a simple mathematical programming problem. Demonstrate ability to analyse a given problem using basic principles and identify appropriate solution methods using simplex methods and its variations. Show ability to interpret the results physically and to communicate these in writing and orally. Show ability to assess oneself, identify and address own learning needs. Show ability to interact effectively in a learning group.

Module code: APMM 318

Semester 1

Title: **Differential Equations and their Applications**

Module outcomes:

To identify and formulate mathematical models of parabolic, hyperbolic and elliptic types together with their boundary and initial conditions. To analyze using basic principles and identify solution methods for the various homogeneous and non-homogeneous boundary value problems of the models. To interpret the result physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs.

Module code: APMM 327

Semester 1

Title: **Fluid Mechanics**

Module outcomes:

To demonstrate knowledge of the Lagrangian and Eulerian approaches to describing fluids, to understand and define, the terms: inviscid, irrotational, incompressible, vorticity, and circulation, to derive the equation of conservation of mass (equation of continuity), and, for incompressible fluids

and Euler's equation of motion, given standard assumptions, to state and apply Bernoulli's equation for steady incompressible flow, to understand the concept of stream functions and their use in obtaining fluid streamlines, to solve simple problems involving the complex velocity potential, state, prove and apply Milne-Thomson Circle Theorem, to solve simple problems of viscous flow using Navier-Stokes equations. To demonstrate various analytical and problem-solving skills by applying fluid mechanics to a wide range of problems arising in various fields; students will demonstrate some of the skills involved in mathematical modelling: namely, transforming a real physical problem into a mathematically tractable form and then being able to interpret and communicate the results of the calculation. To interpret the results physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs. To interact effectively in a learning group.

Module code: APMM 328

Semester 1

Title: **Numerical Analysis**

Module outcomes:

To demonstrate knowledge and ability to solve initial-value problems using Runge-Kutta methods, find numerical solutions to differential equations, find the least square data, generate orthogonal polynomials including the trigonometric polynomials and Chebyshev polynomials, and use orthogonal polynomials for data/function approximations, solve boundary-value problems using shooting methods, solve initial-value problems using multistep methods. To demonstrate problem-solving skills by solving initial-value problems using Runge-Kutta and multistep methods, solving boundary-value problems using shooting methods, applying the basic properties of Chebyshev polynomials, performing numerical stability analysis. To interpret the results physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs. To interact effectively in a learning group.

MA2.18 MATHEMATICS

Module code: MAYM 116

Semester 1

Title: **General Mathematics**

Module Outcomes:

Demonstrate fundamental knowledge of the function concept, circle measure and trigonometric functions, inverse functions and inverse trigonometric functions, mathematical induction, the binomial theorem, conic sections, vectors and vector operations, limits, continuity and differentiability of standard functions, applications of differentiation and the indefinite integrals of simple functions. Demonstrate problem solving skills by analyzing known and unknown problems, proving theorems through mathematical induction, determining limits of standard functions, computing derivatives and indefinite integrals of simple functions and sketching them, formulating optimization problems in mathematical terms and using derivatives to solve them, do computations and sketching of conics and do computations with vectors.

Module code: MAYM 126

Semester 1

Title: **Calculus and Algebra**

Module Outcomes:

Demonstrate fundamental knowledge of the differentiation and integration of logarithmic, exponential and inverse trigonometric functions, applications of integration, Integration techniques, parametric equations and polar coordinates representations, first order ordinary differential equations and the algebra of complex numbers. Demonstrate problem solving skills by analyzing known and unknown problems, use knowledge of techniques to evaluate integrals and improper integrals, apply L'Hopital's rule, determine derivatives and integrals of logarithmic, exponential and inverse trigonometric functions, solving first order linear differential equations, computing areas, length and volumes, do computations with complex numbers and sketching curves in polar coordinates.

Module code: MAYM 117

Semester 1

Title: **Calculus I**

Module Outcomes:

Demonstrate fundamental knowledge of the function concept, circle measure and trigonometric functions, inverse functions and inverse trigonometric functions, mathematical induction, the binomial theorem, conic sections, vectors and vector operations, limits, continuity and differentiability of standard functions, applications of differentiation and the indefinite integrals of simple functions. Demonstrate problem solving skills by analyzing known and unknown problems, proving theorems through mathematical induction, determining limits of standard functions, computing derivatives and indefinite integrals of simple functions and sketching them, formulating optimization problems in mathematical terms and using derivatives to solve them, do computations and sketching of conics and do computations with vectors.

Module code: MAYM 127**Semester 1**Title: **Calculus II****Module Outcomes:**

Demonstrate fundamental knowledge of the differentiation and integration of logarithmic, exponential and inverse trigonometric functions, applications of integration, Integration techniques, L'Hopital's rule and its applications, improper integrals, parametric equations and polar coordinates representations, first order ordinary differential equations and the algebra of complex numbers. Demonstrate problem solving skills by analyzing known and unknown problems, use knowledge of techniques to evaluate integrals and improper integrals, apply L'Hopital's rule, determine derivatives and integrals of logarithmic, exponential and inverse trigonometric functions, solving first order linear differential equations, computing areas, length and volumes, do computations with complex numbers and sketching curves in polar coordinates.

Module code: MAYM 217**Semester 1**Title: **Linear Algebra****Module outcomes:**

Demonstrate problem solving skills and the fundamental knowledge of systems of linear equations, matrices, row echelon form, Gaussian elimination, homogeneous systems, matrix algebra, elementary matrices, inverse matrices, determinants, properties of determinants, cofactor expansion, and the Cramer's rule. Demonstrate problem solving skills and the fundamental knowledge of vector spaces, subspaces, linear independence, basis, dimension, row space, column space, null space, rank, nullity, inner products, orthogonality, inner product spaces, orthonormal bases, the Gram-Schmidt process, eigenvalues and eigenvectors, diagonalization of matrices, linear transformations, kernel, range, and change of basis. To interpret the results physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs. To interact effectively in a learning group.

Module code: MAYM 227**Semester 1**Title: **Advanced Calculus****Module outcomes:**

Demonstrate fundamental knowledge of basic methods and concepts of infinite sequences, series and power series, the basic theorems on convergence of infinite series and their uses, Taylor series, representation of functions by power series, functions of several variables, line integrals, Conservative vector fields, Green's theorem, parametric surfaces, Divergence theorem, Stokes theorem, Riccati and Clairaut equations, second order and higher order ordinary differential equations. Demonstrate problem solving skills by analyzing known and unknown problems, using knowledge of theorems and techniques to calculate line integrals of vector-valued functions and using those in the solving of practical problems, computing surface integrals, using the Stokes theorem and the Gauss theorem in solving problems, determining the solutions of homogeneous linear differential equations with constant coefficient and solving non-homogeneous linear equations by means of methods which are applicable, using the various tests for convergence.

Module code: MAYM 317	Semester 1	
Title: Real Analysis		
Module outcomes:		
<p>Demonstrate problem solving and analytical skills, and fundamental knowledge of the real number system; and in \mathbf{R}^n - sequences, limits, continuous functions, differentiation, the Riemann integral, sequences of functions and infinite series, and the Topology of Cartesian Spaces. To interpret the results physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs. To interact effectively in a learning group.</p>		
Module code: MAYM 318	Semester 1	
Title: Differential Equations		
Module outcomes:		
<p>To demonstrate knowledge of and solve certain nonlinear first-order ordinary differential equations (odes), Clairaut equation, Lagrange equations, Pfaffian equation in three variables, simultaneous differential equations, to use eigenvalues and eigenvectors to solve systems of linear differential equations, to use method of reduction to solve second-order odes, to solve second-order odes with one variable absent, to use miscellaneous solution techniques to solve second-order odes, to identify and solve first-order partial differential equation (pde) of Lagrange type, to classify second-order pdes and solve then using the methods of characteristics and separation of variables. To demonstrate problem-solving skills by solving odes of the first-order but not of the first degree, Clairaut, Lagrange and Pfaffian equation, systems of first-order odes, first-order pdes and second-order linear pdes. To interpret the results physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs. To interact effectively in a learning group.</p>		
Module code: MAYM 327	Semester 1	
Title: Complex Analysis		
Module outcomes:		
<p>To demonstrate knowledge of the basic facts of complex analysis, the concept and theory of analytic functions, Cauchy's Theorem, convergence of complex power series, to evaluate contour integrals using the Cauchy Integral Theorem and the Cauchy Integral Formula in basic and extended form, to evaluate integrals using residues, conformal mappings and their applications. To demonstrate problem-solving skills by showing whether a complex function is analytic, a given function is harmonic, finding an analytic function given its real part, understanding the relationships among the exponential, trigonometric and hyperbolic functions, finding Taylor or Laurent Series for simple function and determining the regions of convergence for each type of series, using residues to evaluate various contour integrals. To interpret the results physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs. To interact effectively in a learning group.</p>		
Module code: MAYM 328	Semester 1	
Title: Abstract Algebra		
Module Outcomes:		
<p>Demonstrate problem solving and analytical skills, and fundamental knowledge of mappings, binary operations, groups, permutations, subgroups, groups and symmetry, equivalence relations, congruence, the division algorithm, integers modulo n, greatest common divisor, the euclidean algorithm, the fundamental theorem of arithmetic, elementary properties of groups, generators, direct products, cosets, Lagrange's theorem, homomorphism, isomorphism, Cayley's theorem, kernels, normal subgroups, quotient groups, the fundamental homomorphism theorem, and the isomorphism theorems. Demonstrate problem solving and analytical skills, and fundamental knowledge of rings, integral domains, subrings, ring isomorphism, fields, characteristic, ordered integral domains, well-ordered integral domain and integers, fields of quotients and rational numbers, polynomials, the division algorithm and factorization of polynomials, homomorphisms of rings, ideals, principal ideal,</p>		

and quotient rings. To interpret the results physically and to communicate these in writing and orally. To assess oneself, identify and address own learning needs. To interact effectively in a learning group.

MA.2.19 NURSING

Module code: EPPM 111	Semester 1	
Title: Ethos and Professional Practice		
Module outcomes: The learner should be able to demonstrate knowledge of principles of professional practice including relevant legislation. Demonstrate value clarification skills.		
Module code: EPPM 221	Semester 2	
Title: Ethos and Professional Practice		
Module outcomes: Apply relevant legislation and basic professional practice in a clinical situation. Demonstrate interpersonal and communication skills		
Module code: FNSM 122	Semester 2	
Title: Fundamentals of Nursing Science and Practicals		
Module outcomes: Application of the knowledge of safety and security, love and belonging, self-esteem and self-actualization needs in assessing and planning for the care of individuals, families and communities. Identification of hazards that individuals, families and communities are faced with. Utilization of the nursing process in meeting the human needs and preventing occurrence of these hazards.		
Module code: FNSM 111	Semester 1	
Title: Fundamental Nursing Science and Practicals		
Module outcomes: Application of the knowledge of physiological needs in assessing and planning for the care of individuals, families and communities. Utilization of the nursing process in meeting the physiological human needs.		
Module code: GNSM 111	Semester 1	
Title: General Nursing Science I and Practicals		
Module outcomes: Learners should be able to assess, diagnose, plan, implement and evaluate the management of patients with respiratory conditions. Relate the clinical manifestations of the respiratory conditions to the patho-Physiology. Advise individuals, families and the communities regarding the promotive and preventive measures of the respiratory conditions. Demonstrate the knowledge of causes, contributory and potential problems of the respiratory conditions.		
Module code: GNSM 122	Semester 2	
Title: General Nursing Science I and Practicals		
Module outcomes: Learners should be able to assess, diagnose, plan, implement and evaluate the management of patients with urinary, endocrine and nervous system conditions. Relate the clinical manifestations of the urinary, endocrine and nervous system conditions to the patho physiology. Advise individuals, families and the communities regarding the promotive and preventive measures of the urinary, endocrine and nervous system conditions. Demonstrate the knowledge of causes, contributory and potential problems of the urinary, endocrine and nervous system conditions.		
Module code: GNSM 222	Semester 2	
Title: General Nursing Science II and Practicals		
Module outcomes: Learners should be able to assess, diagnose, plan, implement and evaluate the management of		

patients with skeleto-muscular and immunity conditions. Relate the clinical manifestations of the skeleto-muscular and immunity conditions to the patho physiology. Advise individuals, families and the communities regarding the promotive and preventive measures of the skeleto-muscular and immunity conditions. Demonstrate the knowledge of causes, contributory and potential problems of the skeleto-muscular and immunity conditions. Provide pre, intra and post operative nursing care and care for those under anesthesia.		
Module code: GNSM 311	Semester 1	
Title: General Nursing Science III		
Module outcomes: Application of leadership theories and styles to manage health care units. Demonstration of effective leadership skills in the management of health care units. Application of the leadership process for effective management of health care services.		
Module code: GNSM 321	Semester 2	
Title: General Nursing Science III		
Module outcomes: Application of organisational culture and climate to manage health care units. Demonstration of effective management processes in the management of health care nits. Application of the decision-making processes and conflict resolution through effective utilization of human, material and financial resources. Debate ethical issues in health care settings.		
Module code: GNSM 311	Semester 1	
Title: Midwifery I and Practicals		
Module outcomes: Ensuring normal pregnancy whenever possible, by maintaining and improving general health of the pregnant woman. Ensuring early detection, referral and management of complications during pregnancy. Provision of nursing care and careful screening of all pregnant women to prevent occurrence of complications. Provision of health education and family planning.		
Module code: MYIM 311	Semester 1	
Title: midwifery I and Practicals		
Module outcomes: Ensuring normal labour whenever possible, by maintaining and improving general health of the pregnant woman. Ensuring early detection, referral and management of complications during labour. Provision of nursing care and careful screening of all pregnant women during labour to prevent occurrence of complications. Ensuring quality midwifery care and prevention of medico-legal hazards during labour.		
Module code: MYIM 411	Semester 1	
Title: Midwifery II and Practicals		
Module outcomes: Ensuring normal and healthy newborn whenever possible, by maintaining and improving general health of the pregnant woman. Ensuring early detection, referral and management of complications of a newborn after delivery. Provision of nursing care and careful screening of all newborn babies to prevent occurrence of complications and medico-legal hazards.		
Module code: MYIM 422	Semester 2	
Title: Midwifery II and Practicals		
Module outcomes: Ensuring normal puerperium whenever possible, by maintaining and improving general health of the pregnant woman. Ensuring early detection, referral and management of complications during puerperium. Provision of nursing care and careful screening of all women during puerperium to prevent occurrence of complications. Provision of health education and family planning during puerperium. Ensuring quality midwifery care and prevention of medico-legal hazards.		
Module code: NCHM111	Semester 1	
Title: Community Nursing Science I and Practicals		
Module outcomes:		

Identification of trends and indicators affecting health. Utilization of the knowledge of epidemiology in determining factors affecting health. Demonstration of the ability to accommodate social and cultural diverse individuals and communities. Display competence in assessing the communities to identify their health needs, resources and problems.		
Module code: NCHM 122	Semester 2	
Title: Community Nursing Science I and Practicals		
Module outcomes: Demonstrate the knowledge of basic human needs of individuals, families and communities. Demonstrate basic communication processes in interacting with individuals, families and communities. Apply the nursing process in the assessment and diagnosis o the basic needs of individuals, families and communities.		
Module code: NCHM 211	Semester 1	
Title: Community Nursing Science II and Practicals		
Module outcomes: Demonstrate the competence of assessing, diagnosing, preventing, treating and rehabilitating common, non- and communicable diseases.		
Module code: NCHM 222	Semester ?	
Title: Community Nursing Science II and Practicals		
Module outcomes: Demonstrate knowledge of health care of specific groups in the community. Apply relevant policies and legislation in the care of these groups.		
Module code: NCHM 311	Semester 1	
Title: Community Nursing Science III and Practicals		
Module outcomes: Demonstrate the ability to identify emergency and/or disaster situations in the community. Display assessment skills in any emergency and/or disaster situation. Demonstrate the ability to participate in the development of a data base on emergency and disaster management. Apply relevant policies and legislation in the management of the said situation.		
Module code: NCHM 311	Semester 1	
Title: Community Nursing Science III and Practicals		
Module outcomes: Demonstrate the ability to identify, establish and co-ordinate consultative forums with the relevant stakeholders in the community. Display assessment skills of available resource utilisation to improve empowerment and capacity building. Demonstrate the ability to participate in the development of health care projects in collaboration with the necessary stakeholders. Apply relevant policies and legislation in the management of identified projects.		
Module code: NRMM 411	Semester 1	
Title: Research Methodology		
Module outcomes: Demonstrate the knowledge of different research methods. Demonstrate the knowledge of the research process.		
Module code: : NRMM 422	Semester 2	
Title: Research Project		
Module outcomes: Demonstrate the ability to design a research proposal. Display the ability to conduct a research study. Compilation of reports on research findings.		
Module code: PHMM112	Semester 1	
Title: Pharmacology		
Module outcomes: Demonstrate the knowledge of the development and sources of drugs. Apply the knowledge of pharmacodynamics, pharmacokinetics and pharmacotherapeutics in prescribing drugs for patients. Assess patients to identify a potential high risk for adverse side effects.		
Module code: PNSM 311	Semester 1	

Title: Psychiatric Nursing Science I and Practicals		
Module outcomes: Demonstrate the knowledge of the history of psychiatric nursing care. Apply the ethical, legal and statutory aspects of psychiatric nursing practices. Demonstrate the ability to assess, diagnose, plan, implement and evaluate nursing care of common psychiatric disorders.		
Module code: PNSM 322	Semester 2	
Title: Psychiatric Nursing Science I and Practicals		
Module outcomes: Demonstrate the ability to create an conducive therapeutic environment in psychiatric nursing care. Demonstrate competence in intervening during an emotional crisis. Demonstrate the ability to participate and utilize group therapy in a psychiatric institution.		
Module code: PNSM 411	Semester 1	
Title: Psychiatric Nursing Science II and Practicals		
Module outcomes: Demonstrate competence in assessment, diagnosing, planning, implementing and evaluation of nursing care of the mentally handicapped/retarded individuals.		
Module code: PNSM 422	Semester 2	
Title: Psychiatric Nursing Science II and Practicals		
Module outcomes: Demonstrate competence in forensic psychiatric nursing. Demonstrate the ability to promote mental health through health education programmes.		
Module code: BIYM 114	Semester 1	
Title: Microbiology		
Module outcomes: Classify micro-organisms according to morphology. Describe the lifecycle of micro organisms, the portals of entry and modes of spread of micro-organisms. Apply knowledge of microbiology in clinical practice.		
Module code: SOCS 111	Semester 1	
TITLE: Introduction to Sociology: Basic Concepts and Themes		
Module outcomes: Demonstrate satisfactory familiarity with sociological concepts like society, social structure and interaction. Exhibit sufficient basic knowledge in basic research methodology and sociological perspectives. Apply theoretical perspectives to different themes in sociology: class, poverty, race, gender. Demonstrate Understanding of the South African society within a comparative perspective.		
Module code: SOCS 122	Semester 2	
Title: Introduction To Sociology: Institutions and The Southern Africa Context		
Module outcomes: Critically analyze different social institutions like family, education, economy, religion, politics, health, and media using sociological perspectives. Contextualize and apply relevant concepts and perspectives to the Southern African developmental context.		
Module code: AGLE 121	Semester 2	
Title: Academic Literacy		
Module outcomes: Possess basic knowledge of academic vocabulary and register as well as the reading and writing of academic texts in order to function effectively in the academic environment; Communicate effectively orally and in writing in an academic environment; Understand, interpret, and evaluate basic academic texts and write appropriate academic genres in a coherent manner by making use of accurate and appropriate academic conventions; Listen, speak, read and write accurately, fluently and appropriately in an ethical framework.		
Module code: PSYC 111	Semester 1	
Title: Refer HSS calender		
Module outcomes:		

Demonstrate the knowledge of basic contextually relevant psychological processes in relation to human physical and cognitive processes within cultural diverse environment. Display the knowledge of contextually relevant psychological approaches in relation to emotional and motivational process within cultural diverse environment.		
Module code: PSYC 121	Semester 2	
Title: Refer HSS calender		
Module outcomes: Demonstrate the knowledge of theoretical foundations and value application in the field of behavioral sciences in relation to interpersonal, health , social and community psychology.		
Module code: BIYM 111	Semester 1	
Title: Anatomy & Biophysics		
Module outcomes: Describe and explain the structure of the tissues, organs, and sensory ,respiratory, gastro intestinal , cardiovascular systems. Describe and explain the biophysics related to sensory, respiratory, gastro intestinal , cardiovascular system. Apply knowledge of human anatomy and related biophysics in clinical practice.		
Module code: BIYM 112	Semester 1	
Title: Anatomy & Biophysics		
Module outcomes: Describe and explain the structure of the tissues, organs, and organs of nervous, urinary, reproductive and endocrine systems. Describe and explain the biophysics related to nervous, urinary, reproductive and endocrine systems. Apply knowledge of human anatomy and related biophysics in clinical practice		
Module code: BIYM121	Semester 2	
Title: Physiology & Biochemistry		
Module outcomes: Describe the physiology of the tissues and organs of the respiratory, special senses, gastro – intestinal and cardio vascular systems accurately as related to nursing practice. Describe the biochemistry and biophysics related to the respiratory, special senses, gastro –intestinal and cardio vascular systems. Apply knowledge of relevant physiology and related biochemistry in clinical practice		
Module code: BIYM 122	Semester 2	
Title: Physiology & Biochemistry		
Module outcomes: Describe the physiology of the tissues and organs of nervous, urinary, reproductive and endocrine systems accurately as related to nursing practice. Describe the biochemistry and biophysics related to the nervous, urinary, reproductive and endocrine systems systems. Apply knowledge of relevant physiology and related biochemistry in clinical practice.		

MA.2.20 NURSING EDUCATION : BN (Education) N110M

Module code: NADM112	Semester 2	
Title: Ethos and Professional Practice		
Module outcomes: Apply principles of professionalism in nursing and midwifery practice. Assume autonomy, responsibility for effective nursing and midwifery care. Maintain professional excellence.		
Module code: CHNM 111	Semester 1	
Title: Community Nursing Science		
Module outcomes: To recognize all factors influencing health in communities. To apply relevant knowledge and skills for community assessment and development.		
Module code: NADM 111	Semester 1	
Title: Nursing Mangement 1		

Module outcomes: Application of leadership theories and styles to manage health care units. Demonstration of effective leadership skills in the management of health care units. Application of the leadership process for effective management of health care services.		
Module code: NEDM 111	Semester 1	
Title: Nursing Education 1		
Module outcomes: Application of the nature of human cognition and the theories of teaching-learning into the teaching-learning process. Demonstration of the knowledge of factors influencing the teaching-learning process. Application of different educational philosophies and styles into the teaching-learning environment.		
Module code: NADM 122	Semester 2	
Title: Nursing Management 1		
Module outcomes: Analyse management theories and styles to manage different health care units. Demonstrate the ability to apply the principles of participatory management in health care delivery. Apply the management process for effective management of health care services. Demonstrate the ability to use communication skills and self-assessment managing health care units.		
Module code: NEDM 122	Semester 2	
Title: Nursing Education 1		
Module outcomes: Demonstrate the knowledge of different teaching-learning strategies to facilitate a learning session. Demonstrate competence in using relevant teaching materials during a teaching-learning session. Demonstrate the ability to utilize relevant technology in facilitating a teaching learning session. Demonstrate the ability to consider cultural diversity in the utilization of teaching learning, strategies and technology.		
Module code: NADM 211	Semester 1	
Title: Nursing Management II and Praticals		
Module outcomes: Formulation of organizational structures for health care units. Formulation of mission, vision, philosophy, objectives and policies of a unit - Management of a nursing unit. Management of a nursing unit.		
Module code: CHNM 211	Semester 1	
Title: Community Nursing Science		
Module outcomes: Demonstrate knowledge of fundamental principles of comprehensive health care. Demonstrate the ability to assess and provide treatment to individuals, families and communities. Display the ability to utilize the primary health care approach in assessing and managing conditions in communities		
Module code: SOCS 111	Semester 1	
Title: Introduction to Sociology : Basic Concepts and Themes		
Module outcomes: Demonstrate satisfactory familiarity with sociological concepts like society, social structure and interaction. Exhibit sufficient basic knowledge in basic research methodology and sociological perspectives. Apply theoretical perspectives to different themes in sociology: class, poverty, race, gender.		
Module code: MANM 111	Semester 1	
Title : Introduction To Management		
Module outcomes: Explain the concepts of needs and needs satisfaction in business and organizations. Explain the concepts of management within organizations. Utilize basic planning, organize, leading, motivation and controlling in business and public sector departments as pillars of the management process. Analyze the role of management in converting inputs into goods and		

services.		
Module code: NADM 222	Semester 2	
Title: Nursing Management II and Praticals		
Module outcomes: Application of principles and processes of decision-making and problem solving. Demonstrate the ability to manage and resolve conflict in an organization. Application of organizational theories and modalities to provide effective service delivery. Apply strategies enhancing productivity and preventing absenteeism as well.		
Module code: CHNM 222	Semester 2	
Title: Community Nursing Science		
Module outcomes: Demonstrate knowledge of health care of specific groups in the community. Apply relevant policies and legislation in the care of these groups.		
Module code: SOCS 121	Semester 2	
Title: Sociology		
Module outcomes: Demonstrate satisfactory familiarity with sociological concepts like society, social structure and interaction. Exhibit sufficient basic knowledge in basic research methodology and sociological perspectives. Apply theoretical perspectives to different themes in sociology: class, poverty, race, gender.		
Module code: MANM 121	Semester 2	
Title: Financial Management		
Module outcomes: Explain the concepts marketing, finance, operations and human resources, and their relevance in organizations. Utilize the conceptual skills in work situations.		
Module code: NADM 311	Semester 1	
Title: Nursing Management II and Praticals		
Module outcomes: Demonstrate the ability to plan strategically for effective health care delivery. Utilize strategies to plan and manage time. Demonstrate the ability to plan, manage, and implement change. Identify and reduce risks in the organization. Identify personnel and unit sources of stress and manage them.		
Module code: CHNM 311	Semester 1	
Title: Community Nursing Science		
Module outcomes: Demonstrate the ability to identify emergency and/or disaster situations in the community. Display assessment skills in any emergency and/or disaster situation. Demonstrate the ability to participate in the development of a data base on emergency and disaster management. Apply relevant policies and legislation in the management of the said situation. Demonstrate the ability to set, monitor and ensure standards in the various nursing care.		
Module code: NRMM 311	Semester 1	
Title: Nursing Research Methodology		
Module outcomes: Demonstrate the knowledge of different research methods. Demonstrate the knowledge of the research process		
Module code: HCOM 111	Semester 1	
Title: Public Relations		
Module outcomes: Demonstrate understanding of cultural and media values. Demonstrate knowledge of media effects on societal morals. Demonstrate understanding of mass communication and press theories.		
Module code: NADM 322	Semester 2	

Title: Nursing Management		
Module outcomes: Demonstrate communication skills to facilitate effective management and collaboration processes. Demonstrate the ability to render quality nursing care and prevent health risks against consumers of health.		
Module code: NRPM 322	Semester 2	
Title: Nursing Research Project		
Module outcomes: Demonstrate the ability to design a research proposal. Display the ability to conduct a research study. Compilation of reports on research findings.		
Module code: CHNM 322		
Title: Community Nursing Science III and Practicals		
Module outcomes: Demonstrate the ability to identify, establish and co-ordinate consultative forums with the relevant stakeholders in the community. Display assessment skills of available resource utilization to improve empowerment and capacity building. Demonstrate the ability to participate in the development of health care projects in collaboration with the necessary stakeholders. Apply relevant policies and legislation in the management of identified projects.		

2.21 PHYSICS

Module code: PHYM 115	Semester 1	
Title: Mechanics and Heat Energy		
Module outcomes:		
Knowledge: At the end of this module students acquire formal mathematical knowledge of the topics covered and fundamental concepts such as force, work, energy and momentum, elasticity, simple harmonic motion, waves, hydrostatics, hydrodynamics and heat. State the laws, definitions and principles of abovementioned concepts concisely in their own words without excluding any relevant information.		
Skills: The students learn how to use differential and integral-calculations in natural science problems. At the end of the module, they are skilful enough to use these techniques when describing certain sections of theory and when solving a variety of problems in the abovementioned study areas. In the practical the students develop skills in measuring, calculations and report writing of natural science processes which extent beyond field of Physics. Solve problems similar to those they have met in the examples; the problems to be solved are applications of the abovementioned topics. Also solve unfamiliar problem at the same level. Demonstrate basic knowledge and insight of the concepts studied in the module content. In practical sessions students perform a variety of experiments successfully, compute the results and be able to present the results graphically, thereafter they should be able to meaningfully and scientifically communicate through a report.		
Module code: PHYM 128	Semester 2	
Title: Basic Electromagnetism and Modern Physics		
Module outcomes:		
Knowledge: At the end of this module students acquire formal mathematical knowledge of the topics covered, electricity, magnetism, optics and other topics from atomic and nuclear physics. State the laws, definitions and principles of abovementioned concepts concisely in their own words without excluding any relevant information.		
Skills: Students further develop their skills in solving scientific problems and explaining physics processes using differential and integral calculations. Demonstrate basic knowledge and insight		

of the abovementioned physical phenomena as they occur in everyday life. Solve problems similar to those in they have met in the examples; the problems to be solved are applications of the abovementioned topics. Demonstrate basic knowledge and insight of the concepts studied in the module content. In practical sessions students perform a variety of experiments successful, compute the result and be able to present the results graphically.

Module code: PHYM 215

Semester 1

Title: **Mechanics and Thermal Physics**

Module outcomes:

Knowledge:

At the end of this module students acquire a formal mathematical knowledge of the topics covered, fundamental concepts and experimental aspects related to rotational dynamics and the behaviour of fluids at different temperatures and pressures. State the laws, definitions and principles of abovementioned concepts concisely in their own words without excluding any relevant information.

Skills:

The students learn how to use differential and integral-calculations in natural science problems involving rotational dynamics. when dealing with gases the students can use aspects of combinatorics to derive the physical behaviour of gases from the molecular level. Solve problems similar to those they have met in the examples, the problems to be solved are applications of the abovementioned topics. Demonstrate basic knowledge and insight of the concepts studied in the module content. In practical sessions students perform a variety of experiments successfully, compute the result and be able to present the results graphically, thereafter they should be able to meaningfully and scientifically communicate through a report.

Module code: PHYM 216

Semester 2

Title: **Atomic Physics**

Module outcomes:

Knowledge:

At the end of this module the students acquire a formal mathematical knowledge of the topics covered and how to describe the atomic view of matter and the fundamental concepts and experimental aspects related to charge radiation, atomic spectra. State the laws definitions and principles of avovementioned concepts concisely in their own words without excluding any relevant information (physics and mathematics). Explain what thermal radiation is and be able to use graphical methods for illustration. Explain the photoelectric effect and explain the Compton effect. Describe the production of X-rays and attenuation of X-rays in materials. Discuss the four laws of atomic physics in detail. Explain characteristic X-rays and know how to use it to identify atoms. Discuss the de Broglie wavelength and describe the dual nature of matter.

Skills:

The students learn how to use differential and integral-calculations in natural science problems involving charge radiation, atomic and molecular spectra, lasers, X-ray production, atomic structure of matter. In practical sessions students perform a variety of experiments successfully, compute the results and be able to present the results graphically, thereafter they should be able to meaningfully and scientifically communicate through a report.

Module code: PHYM 221

Semester 2

Title: **Waves and Quantum Mechanics**

Module outcomes:

Knowledge:

At the end of this module the students acquire a formal mathematical knowledge of the topics covered on how to solve simple oscillation problems that involve damped and driven harmonic motion; describe mathematically the superposition of waves; study and apply fundamental concepts in quantum mechanics. State the laws, definitions and principles of abovementioned concepts concisely in their own words, without excluding any relevant information. Solve the aforementioned differential equations as initial value problems. Discuss the evolution of the aforementioned situations with time. Discuss the Heisenberg uncertainty principle

meaningfully.

Solve Schrödinger equation for

- (i) a free particle and the related concepts
- (ii) a particle in an infinite square well

Solve problems similar to those in they have met in the examples; the problems to be solved are applications of the abovementioned topics

Skills:

The students learn how to use differential and integral-calculations in natural science problems involving wave motion at macroscopic and microscopic level. Demonstrate basic knowledge and insight of the concepts studied in the module content. Model oscillating single oscillating particles by finding the appropriate differential equations. Demonstrate an understanding of the dictates of choosing between classical mechanics and quantum mechanics. Perform a variety of experiments successfully, compute the result and be able to present the results graphically; thereafter they should be able to meaningfully and scientifically communicate through a report.

Module code: PHYM 222

Semester 2

Title: **Electricity and Magnetism**

Module outcomes:

Knowledge:

The students acquire mathematical knowledge of presenting the electric and magnetic fields using vector theory and integral calculus. State the laws, definitions and principles of abovementioned concepts concisely in their own words without excluding any relevant information. Discuss the electric flux density vector and the divergence theorem. Determine the potential difference about a point charge and a charge system. Determine the energy expended to build up a system of charges. Discuss vector magnetic potentials. Discuss magnetic material. Describe inductance and time varying fields. Solve problems similar to those they have met in the examples, the problems to be solved are applications of the abovementioned topics. Demonstrate basic knowledge and insight of the concepts studied in the module content.

Skills:

Students further develop their skills in solving scientific problems and explaining the electric field and magnetic fields using differential and integral calculations and vector theory. In practical session students demonstrate basic knowledge and insight of the abovementioned physical phenomena as they occur in everyday life. Handle electrostatic fields using vectors in Cartesian, cylindrical and spherical coordinate systems. Perform a variety of experiments successfully, compute the results and be able to present the results graphically, thereafter they should be able to meaningfully and scientifically communicate through a report.

Module code: PHYM 315

Semester 1

Title: **Classical Mechanics**

Module outcomes:

Knowledge:

At the end of this module the students have a formal mathematical knowledge of how to solve dynamic problems that involve central forces, moving coordinate systems, Lagrangians as well as special relativity. Use differential vector calculus to determine the position vector, velocity and acceleration of a particle in a moving coordinate system. Demonstrate basic knowledge and insight of the concepts studied in the module content. Discuss a central force field. Discuss Kepler's laws of planetary motion. Derive the potential energy in a gravitational field. Set up and solve the energy equation of an orbit in a central force field. Solve the differential equations associated with a dynamics of systems of particles as initial value problems. Describe the motion of rigid bodies in three dimensions. Derive the Lagrangian of simple systems and solve the equations of motion. Derive the equations used in Lorentz transformations. Use the Lorentz transformation for finding the momentum, mass and energy at relativistic speeds. Solve problems similar to those they have met in the examples, the problems to be solved are applications of the abovementioned topics.

Skills:

The students learn how to use differential and integral-calculations in natural science problems

involving gravitational field theory and transformations between systems of axes. In practical sessions students perform a variety of experiments successfully compute the result and be able to present the results graphically, thereafter they should be able to meaningfully and scientifically communicate through a report.

Module code: PHYM 316

Semester 1

Title: **Solid State Physics**

Module outcomes:

Knowledge:

At the end of this module the students should have the knowledge to discuss crystal structures and the models used. Describe the basic concepts of the structure of solids and the principles of structure determination. Describe the elementary models for bonding of atoms and molecules and the consequential classifications used in solid state physics. Relate the general properties (electrical, thermal and optical) for each class, including details of the expected crystal structures to the mechanical properties. Perform simple calculations involving cubic structures and hexagonal close-packed structure, which are commonly found in nature. Explain how the problem of elastic scattering of X-rays by a crystal is treated using the concept of the reciprocal lattice. Give a description of the feature of the vibrations of monatomic and of diatomic linear chains. Explain the significance of dispersion curves in three dimensions. Describe the free electron model and the effective mass, the density of states, the Fermi level. Explain qualitatively the band theory. Distinguish between an insulator, a semiconductor and a metal.

Skill:

The students learn how to use mathematical abstraction to represent and solve problems involving periodic structures.

Module code: PHYM 317

Semester 1

Title: **Quantum Mechanics**

Module outcomes:

Knowledge:

At the end of this module the students will have gained knowledge and insight into the motion of microscopic particles. The student should be able to, Demonstrate basic knowledge and insight of the abovementioned physical phenomena as they occur in everyday life. State the laws, definitions and principles of abovementioned concepts concisely in their own words, without excluding any relevant information. Solve problems similar to those in they have met in the examples; the problems to be solved are applications of the abovementioned topics. Demonstrate basic knowledge and insight of the concepts studied in the module content

Skill:

The students learn how to use analytical and approximation methods to solve a variety of problems.

Module code: PHYM 318

Semester 1

Title: **Project and Research**

Module outcomes:

At the end of the module the students should be able to produce a self-contained written report about a scientific experiment which clearly explain the experimental methods, results, data analysis and estimation of uncertainties and which also discuss results.

Module code: PHYM 321

Semester 1

Title: **Electromagnetism**

Module outcomes:

Knowledge:

At the end of this module the students will have gained knowledge and insight into the motion of a microscopic particle. Students should be able to do the following, demonstrate basic knowledge and insight of the abovementioned physical phenomena as they occur in everyday life. State the laws, definitions and principles of abovementioned concepts concisely in their own words, without excluding any relevant information. Demonstrate basic knowledge and insight of the concepts studied in the module content.

Skill:

The students learn how to use analytical and approximation methods to solve a variety of problems. Solve problems similar to those in they have met in the examples; the problems to be solved are applications of the abovementioned topics

Module code: PHYM 322**Semester 1**Title: **Nuclear Physics****Module outcomes:****Knowledge:**

At the end of this module the students will have gained knowledge and insight into the structure and behaviour of nuclear structures. Students should be able to do the following, demonstrate basic knowledge and insight of the abovementioned physical phenomena as they occur in everyday life. State the laws, definitions and principles of abovementioned concepts concisely in their own words, without excluding any relevant information. Demonstrate basic knowledge and insight of the concepts studied in the module content

Skill:

The students learn how to use analytical and approximation methods to solve a variety of problems. Solve problems similar to those in they have met in the examples; the problems to be solved are applications of the abovementioned topics.

Module code: PHYM 323**Semester 2**Title: **Statistical Physics****Module outcomes:****Knowledge:**

At the end of this module the students will have gained knowledge and insight into the motion of a microscopic particle. Students should be able to do the following, State the laws, definitions and principles of abovementioned concepts concisely in their own words, without excluding any relevant information. Solve problems similar to those in they have met in the examples; the problems to be solved are applications of the abovementioned topics. Demonstrate basic knowledge and insight of the concepts studied in the module content

Skill:

The students learn how to use analytical and approximation methods to solve a variety of problems. Demonstrate basic knowledge and insight of the abovementioned physical phenomena as they occur in everyday life.

Module code: PHYM 324**Semester 2**Title: **Project and Research****Module outcomes:**

At the end of the module the students should be able to produce a self-contained written report about a scientific experiment which clearly explain the experimental methods, results, data analysis and estimation of uncertainties and which also discuss results.