

MAFIKENG CAMPUS
AGRICULTURE, SCIENCE
AND TECHNOLOGY

UNDERGRADUATE PROGRAMMES

J A A R B O E K

2017

Y E A R B O O K



NWU[®]

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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 four schools namely;

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

FAST hosts three centres namely;

- ❖ Centre for Animal Health Studies,
- ❖ Centre for Applied Radiation Science and Technology (CARST).
- ❖ Centre for Indigenous Knowledge Systems (IKS)

FAST hosts three research entities namely;

- ❖ Food Security and Safety in the North West Province (Niche Area) and
- ❖ Lifestyle Diseases (Niche Area) and
- ❖ Material Science Innovation and Modelling (Focus Area)

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

Faculty Manager

P. Mtotywa, Cert in Financial Mngmt (East London College), B. Admin PA (UFH).

Administrative Assistant

T. Oliphant

DIRECTORS OF SCHOOLS / RESEARCH UNITS

School of Agricultural Sciences (SoAS)

V. Mlambo, BSc., MSc (Ani. Sci.) (UZ), MSc (Dev. Stats.) (UWI), PhD.(Reading), CERT (Univ. Teaching & Learning)(UWI).

School of Mathematical and Physical Sciences (SoMPS)

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

School of Environmental and Health Sciences (SoEHS)

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

School of Nursing Sciences (SoNS)

A.J Pienaar, Phd (UKZN), MA (PU vir CHO), M.Ed (NWU), Advance University Diploma in Health Science Education and Health Service Management (NWU), B.Cur. (RAU)

School Of Research and Postgraduate studies

U. Useh BSc. Hons Physiotherapy(University Of Ibadan), LLB (NWU) , M.Ed Exercise Physiology (University Of Ibadan), PhD (UNIVEN) PGD in Education (University Of Plymouth) Fellow Higher Education Academy (UK), PgDip in HR (NWU)

*

CENTRE MANAGERS

Applied Radiation Science And Technology

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

Indigenous Knowledge Systems

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

RESEARCH NICHE AND FOCUS AREAS

RESEARCH NICHE AREA (Food Security and Safety)

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

RESEARCH NICHE AREA (Lifestyle Diseases)

*

U. Useh BSc. Hons Physiotherapy(University Of Ibadan), LLB (NWU) , M.Ed Exercise Physiology (University Of Ibadan), PhD (UNIVEN) PGD in Education (University Of Plymouth) Fellow Higher Education Academy (UK), PgDip in HR (NWU)

RESEARCH FOCUS AREA (Material Science Innovation and Modelling)

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

SUBJECT GROUP CHAIRPERSONS

Agricultural Economics & Extension

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

Animal Health

*M. Mwanza,DVM (University of Lubumbashi) MSc ,(UJ) PhD (UJ)

Animal Science

L.E. Motsei, BSc Agric, BSc Agric (Hons), MSc Agric (UNW), PhD (NWU)

Biological Sciences

*Prof E. Mukwevho, BSc (Univen), BSc Hons (UL), MSc (University of Cape Town, UCT), PhD (University of Cape Town, UCT), Cert in Financial Management (UCT), Cert in Project Management (UCT).

Chemistry

*L.M. Katata-Seru, BSc, BSc Hons(UWC) MSc, PhD (Stellenbosch)

Computer Science

*N. Gasela, MSc(USSR) MSc (Abertay,Dundee) PhD (NUST, Zimbabwe)

Crop Science

*K Ramachela B. Sc Agriculture (University of Guyana), M. Sc Plant Pathology (University College of Wales), PhD Forestry & Natural Resources Science (Stellenbosch)

Geography And Environmental Sciences

*Dr. M. Manjoro BSc.Ed (ISP,EJV, Cuba), BSc. Hons-GIS/RS (UFH), MSc (UNAH, Cuba), PhD (NMMU)

Indigenous Knowledge Systems Centre

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

Mathematical Sciences

*O. Olela Otafudu, BSc, BSc Hons (University of Kinshasa, DR Congo), MSc, PhD (UCT)

Nursing Science

*M. A. Rakhudu, Diploma in Midwifery, Diploma in General Nursing (Nataalspruit Hospital), Diploma in Human Resource Management (UNW), B.A. Cur, B.A. Cur Hons, (UNISA), M.Cur (PU). M.Cur Health Science Education (UNISA), PhD (NWU)

Physics

* D.C. Ndiitwani BSc Hons (PU for CHE), MSc (NWU), PhD (UKZN)

RESEARCH PROFESSORS

Professor

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

Professor

M.P Koen, BA Cur Education and Administration (UNISA), M. Cur Professional Nursing Science (RAU), MA Psychiatric Nursing Science (NWU), PhD Professional Nursing Science (RAU), PhD Psychology (NWU)

Professor

U. Useh BSc. Hons Physiotherapy(University Of Ibadan), LLB (NWU) , M.Ed Exercise Physiology (University Of Ibadan), PhD (UNIVEN) PGD in Education (University Of Plymouth) Fellow Higher Education Academy (UK), PgDip in HR (NWU)

Professor

TR. Medupe, MSc Astrophysics (UCT), PhD (UCT)

Associate Professor

A.J Pienaar, Phd (UKZN), MA (PU vir CHO), M.Ed (NWU), Advance University Diploma in Health Science Education and Health Service Management (NWU), B.Cur. (RAU)

Farm Administration

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

Secretaries:

K.A. Kgaboesele

R.M. Maepa

M.K. Medupe

M.K. Mosala

J.B. Ndlangisa

S.M. Sepeng

Assistant Admin. Officers:

B. Tau

S. Thaga

N. Kakula, B Soc (NWU)

MN Sichembe, BA Hons Communication, PGDip Marketing Management (NWU)

T Monakwane, BA Land Reform and Rural Development, MPAPublic Administration (NWU)

Messengers:

J.K. Beleng

S. T. Moses

O. Mocumi (General Attendant)

TECHNICIANS

Animal Health

J. K. Lesetedi Mr (Senior Technician), Dip Animal Health (Taung College of Agric), BSc Agric (Animal Health), BSc Agric (Hons) (AH) (UNW)
G. M. Raito Mr (Senior Technician), Dip in Animal Health (Taung College of Agric), BSc Agric (Animal Health), BSc Agric (Hons) (AH) (UNW)
Mpho Tsheole Miss (Principal Laboratory Technician), BSc Agric (Animal Health), BSc Agric (MSc) (Agric, AH) (UNW)
T.P. Ateba Mrs (Animal Health Technician), BSc Agric (Animal Health), BSc Agric (Hons) (A/H), MSc Agric (NWU)
T. K. Moroane Mr (Animal Health Technician) BSc Agric (Animal Health), BSc Agric (Hons) (A/H) (NWU)
O.M. Tekolo Mr (Senior Laboratory Technician) Bsc Agric (Animal Health), Bsc Agric (Hons) (A/H) (NWU), Msc (Microbiology) (Stellenbosch)
Sifiso Mnisi Mr (Animal Health Technician) BSc Agric (Animal Health), (NWU)
V.E. Mjekula (Technician) BSc Agric (Animal Health), BSc Agric (Hons) (A/H) (NWU)
B R Dichaba Mr (Animal Health Technician) Dip Animal Health(NWU), BSc Agric (Animal Health), BSc Agric (Hons) (AH) (NWU)
T Ramaili Mr (Laboratory Technologist) M Med Sc (UKZN)

Rifilwe Kgosiemang Miss (Hospital Receptionist)
G. Kwamongwe Miss (Clinic Attendant - Small Animals)
J. Mogotsi Miss (Lab Attendant)
O. Mocumi Mr (General Attendan, Large Animal)

Animal Science

S. MMutloane (Small Stock Unit) Dip Animal Health (Taung College of Agric)
P. Mothabane (Dairy Unit) - BSc. Agric (Animal Science) (NWU), BSc AgricHN (Animal Science) (NWU)
M Makhafola (Poultry Unit) M: Tech Agriculture (Central University of Technology)
L Mangena BSc. Agric Animal Production, MSc Agric Animal Production (UL)
Buthane BSc Agric Animal Production (UL)

Applied Radiation Science and Technology

Radiation Protection Officer

T Kupi, MSc in Applied Radiation Science (CARST) PGDM (NWU)

Biological Sciences

MC Manganyi (Senior Laboratory Technician – Microbiology) (N. Diploma Biotechnology and Microbiology (TUT), B. Tech Pharmaceutical Sciences and Good Laboratory Management (TUT), M.Tech Pharmaceutical Science and Microbiology (TUT)

BT Dikobe (Laboratory Technician – Biology) (BSc Biology-Psychology (NWU), BSc Hons. Microbiology (NWU), MSc Biology (NWU)

N Rabambi (Laboratory Technician –Biochemistry) – BSc (Biochemistry), BSc Hons (Microbiology)

J Morapedi (Laboratory Assistant – Biological Sciences)

Chemistry

N. Gumbi B. Tech (Chem), B Tech (Man) Durban University Of Technology, BSc. (Hons) Env. Man. UNISA

K. Mokalane BSc (Chem and Bio) (NWU), PGCE (NWU), BSc (Hons), MSc (UCT),
K. Seoposengwe BSc (NWU)
S. Loyilani
T. Majele BSc (NWU)
P. Mahlangu

Crop Science

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

N. Bett (BSc. NWU, BSc.Hons (NWU) MSc. Geography, NWU), (Senior Technician, GIS/RS)
N.Mkiva (BSc, UFH, BSc (Hons) Geography,UFH), (Senior Technician, Physical Geography)

Physics

T.M Lefenya, Bsc (NWU), Bsc Hons (NWU)
S. Thamaga, BSc (UNW), BSc Hons (NWU)

Computer Science

T Mogale, Bsc, BSc Hons, MSc (NWU)

Farm

B. S. Mmutloane, Dip Animal Health (Taung College)
K. P. Motlhabane, Dip Agric (Unibo), BSc Agric (UNW), BSc AgrichN (Animal Science) (NWU)

FACULTY COUNCIL – ACADEMIC BOARD

AGRICULTURAL ECONOMICS AND EXTENSION

Professor

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

Professor

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

Senior Lecturer

Dr. Karabo Mabe BSc, MSc, PhD (Agricultural Extension) North-West University

Senior Lecturer Dr. M.L. Mabuza, Dip. Agric, BSc. Agricultural Economics (University of Swaziland) MSc Agricultural Economics (University of Zimbabwe), M.Agric (Food Security), PhD Agricultural Economics (University of KwaZulu-Natal)

Lecturer

Ms Chiedza Tsvakirai, BSc (Agricultural Economics) University of Fort Hare, MSc (Agricultural Economics (University of Pretoria).

Lecturer

Ms. T.M Moagi BSc Agricultural Economics, BSc (Hons) Agricultural Economics, MSc Agricultural Extension (North West University)

Lecturer

Mr K.K.S Nxumalo BSc Agricultural Economics, BSc (Hons) Agricultural Economics, MSc Agricultural Economics (North West University)

Lecturer

Dr S Modirwa BSc Agric Animal Health, BSc Agric Honours (Extension), MSc Agric (Extension) PhD Agric (Extension) North West University. CERT. Teachers Training

ANIMAL HEALTH

Associate Professor

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

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

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

Senior Lecturer

M. Mefane, BVSc (UP) BSc Agric(Hons) (Unin)

Senior Lecturer

L.K. Mefane BVSc (UP) BSc (Hons) (Unin)

Senior Lecturer

*M. Mwanza, DVM (University of Lubumbashi), MSc (UJ) PhD (UJ)

Senior Lecturer

*L Ngoma, DVM (University of Lubumbashi), MSc (Witt) PhD (Witt)

Senior Lecturer

Rebecca Quam BSc (Health Sciences)(Univ of Tulsa), DVM (UK)

Senior Lecturer

*Mack Kayamba Ntumba, DVM (University of Lubumbashi)

ANIMAL SCIENCE

Professor

V. Mlambo, BSc., MSc (Ani. Sci.) (UZ), MSc (Dev. Stats.) (UWI), PhD.(Reading), CERT (Univ. Teaching & Learning)(UWI).

Associate Professor

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

Associate Professor

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

Senior Lecturer

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

Senior Lecturer

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

Senior Lecturer

L.E. Motsei, BSc Agric, BSc Agric (Hons), MSc Agric (UNW), PhD (NWU)

Lecturer

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

Lecturer

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

Lecturer

C.M. Mnisi, BSc., MSc (Ani. Scie.) (NWU)

Lecturer

K. E. Ravhuhali, BSc. Agric (Ani. Sci.), BSc. Agric Hons (Ani. Sci.)(Past. sci) (UNW), MSc. Agric (Animal Production) (UL)

BIOLOGICAL SCIENCES

Professor

*Prof E. Mukwevho, BSc (Univen), BSc Hons (UL), MSc (University of Cape Town, UCT), PhD (University of Cape Town, UCT), Cert in Financial Management (UCT), Cert in Project Management (UCT).

Professor

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

Professor

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

).

Associate Professor

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

P. W. Malan, BSc Ed, MSc, PhD (University of Free State).

Associate Professor

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

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), PhD (NWU)

Lecturer

S.L Fuku, BSc (UFS), BSc Hons (UFS), MSc (UFS), DTech (CUT)

Lecturer

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

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

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

Associate Professor

M Mathuthu, BSc Gen (Physics, Mathematics, Chemistry) BSc Hons Physics (UZ) PhD Nuclear Physics (UZ)

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

*L.M. Katata-Seru, BSc, BSc Hons(UWC) MSc, PhD (Stellenbosch)

Senior Lecturer

Dr M. Kabanda

Senior Lecturer

Dr D.C. Onwudiwe BSc (Hons), MSc (Ibadan), PhD (Fort Hare)

Senior Lecturer

Dr I Bahadur, BSc Hons (Banaras Hindu University) MSc (University of Delhi), PhD (Durban University of Technology)

Lecturer

Dr Z. Mkhize BSc Hons, MSc (KZN), PhD (KZN)

Lecturer

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

CROP SCIENCE**Professor**

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

Senior Lecturer

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

Professor

F Kutu, BSc. Agriculture; MSc. Agronomy (Soil Science) & PhD Agronomy (University of Ibadan, Nigeria)

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)

Senior Lecturer

E.T. Sebetha BSc Honours Botany (UNIN), MSc Horticulture (UL), PhD Agronomy (UKZN)

Lecturer

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

COMPUTER SCIENCE**Senior Lecturer**

*N. Gasela, MSc(USSR) MSc (Abertay,Dundee) PhD (NUST, Zimbabwe)

Associate Professor

BM Esiefarienrhe MSc (Abubakar Tafawa Balewa University), Bauchi) Ph.D (Modibbo Adama University of Technology)

Senior Lecturer

B. Isong, BSc Hons (University of Calabar, Nigeria), MSc (Blekinge Institute of Technology, Sweden), PhD (NWU)

Lecturer

F. Lugayizi, BSc Hons, MSc, PhD, (NWU)

Lecturer

N, Dladlu, BSc, BSc Hons, (University Of Fort Hare), MSc (NWU)

Lecturer

T.L. Letlonkane, BSc Hons, MSc (NWU)

Lecturer

N. Motlhabane, BSc, BSc Hons, MSc (NWU)

GEOGRAPHY AND ENVIRONMENTAL SCIENCES

Associaite Professor

L. G. Palamuleni MSc (University of Malawi) PhD (UJ)

Associate Professor

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

Associate Professor

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

Professor

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

Senior Lecturer

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

Senior Lecturer

* Dr. M. Manjoro BScEd (ISP,EJV) BSc Hons(UFH), MSc(UNAH), PhD(NMMU)

Lecturer

Mr. N. Ndou, BSc (NWU), BSc. Hons-GIS (NMMU), MSc. (NMMU)

INDIGENOUS KNOWLEDGE SYSTEMS**Professor**

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

Lecturer

M. Koitsiwe, B Soc Sc (UNW), B.A IKS (Hon) (NWU), M. A IKS (NWU)

Lecturer

W.OtangMbeng BSc, MSc Botany (University of Buea, Cameroon), PhD Botany (UFH)

Junior Lecturer

T. Taaka, Diploma (Pharmacy Technology (NUL), B.Pharm Hons. (NWU)

MATHEMATICAL SCIENCES**Professor**

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

Associate Professor

S C Noutchie, MSc (UNISA), PhD (UKZN),

Associate Professor

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

Associate Professor

O Olela-Otafudu, BSc, BSc Hons (University of Kinshasa, DR Congo), MSc, PhD (UCT)

Senior Lecturer

A. Adem, BSc, BSc Hons, MSc, PhD (NWU)

Lecturer

D M Mothibi, BSc, BSc Hons (NWU) Msc (University Of Stellenbosch)

Lecturer

Mr I Mhlanga MSc Ed (Bindura University), MSc (NWU)

Lecturer

S Mkiva, BSc, BSc Hons, MSc (UWC)

Lecturer

L. Phali, BSc, BSc Hons, MSc, PhD (NWU)

Lecturer

M. Mphakalasi, BSc (NUL, Lesotho), MSc (RPI, New York)

NURSING SCIENCE**Associate Professor**

A.J Pienaar, PhD (UKZN); MA (PU vir CHO)); M.Ed. (NWU); Advance University Diploma in Health Science Education and Health Service Management (NWU); B.Cur. (RAU)

Professor

M.P Koen, BA Cur Education and Administration (UNISA); M. Cur Professional Nursing Science (RAU); MA Psychiatric Nursing Science (NWU); PhD Professional Nursing Science (RAU); PhD Psychology (NWU)

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 Councelling).

Senior Lecturer

*M. A. Rakhudu, Diploma in Midwifery, Diploma in General Nursing (Natalsspruit Hospital), Diploma in Human Resource Management (UNW), B.A. Cur, B.A. Cur Hons, (UNISA), M.Cur (PU), M.Cur Health Science Education (UNISA), PhD (NWU)

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

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), M.Cur Advanced Midwifery (NWU).

Lecturer

S.K. Khunou Diploma in Nursing Science (General ,Psychiatry,Community and Midwifery) (MMACON), BA CUR (Nursing Education and Health Service management) UNISA, MCur (NWU, Mafikeng Campus)

Lecturer

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

Lecturer

Z. Manyisa Bcur (UNIN, Turfloop), MPH (Medunsa) PhD (University of Limpopo)

Lecturer

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

Lecturer

I.O. Mokgaola BNSc, MCur (NWU)

Lecturer

N.V. Zulwayo BNSc, MCur (NWU)

Lecturer

J.Sebaeng Diploma in Forensic Nursing (UOFS), Advanced University Diploma in Health Service Management, Advanced University Diploma in Nursing Education, BNSc, MCur (NWU)

Lecturer

M.G Serapelwane: Diploma in general nursing (Taung nursing school), Diploma in midwifery (Taung nursing school), BA CUR Nursing Education and Administration (Potchefstroom University) Diploma in Clinical Health Assessment Treatment and Care (MMACON), MCur (NWU)

Resource Center Manager

P.T. Motsilanyane, RN, RM (MMACON), 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 (Technikon Northern Gauteng)

Preceptor

Meno, O F. BNSc (NWU:Mafikeng); Diploma in health science (PHC) (NWU)

Preceptor

Boitumelo Molato BNsc (NWU), MCur (NWU)

Preceptor

M.S. Lethale Diploma in Nursing Science, Diploma in Midwifery, Diploma in Operating Nursing Science (Baragwanath Nursing College), Advanced Diploma in Health Sciences Management (UNISA), Postgraduate Diploma in HIV and AIDS Management (Stellenbosch University)

Preceptor

M Phaka BNSC (UNIBO), Advanced Diploma in Midwifery and Neonatal Nursing Science (Garankua Nursing College)

PHYSICS

Professor

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

Professor

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

Associate Professor

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

Senior Lecturer

R. Mukaro, BSc Hons, MPhil (University of Zimbabwe), PhD(UKZN)

Senior Lecturer(HOD)

D. C. Ndiitwani BSc Hons (PU for CHE), MSc (NWU), PhD (UKZN)

Senior Lecturer

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

Senior Lecturer

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

Senior Lecturer

A.A Gedelew MSc (UCT), PHD (UCT)

Senior Lecturer

B Letarte, MSc (Université de Montréal, Canada), PHD (University of Groningen, The Netherlands)

Lecturer

A Phori, BSc, BSc Hons (NWU), MSc (NWU)

Lecturer

D. Nhlapo, BSc (UFS), BSc Hons (UCT), MSc (NWU)

Lecturer

P.O Abedigamba, MSc(UCT)

Junior Lecturer

O Tlhapane, BSc (NWU), BScHons (NWU)

SCIENCE CENTER

Science Center Manager

L Y Molebatsi, BSc, BSc Hons, MSc (Botany) NWU

RESEARCH PROFESSORS

Professor

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

Associate Professor

U. Useh BSc. Hons Physiotherapy.M.Ed Exercise Physiology (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

Professor

M.P Koen, BA Cur Education and Administration (UNISA); M. Cur Professional Nursing
Science (RAU); MA Psychiatric Nursing Science (NWU); PhD Professional Nursing Science
(RAU); PhD Psychology (NWU)

CAPACITY DEVELOPMENT STAFF**Animal Science**

NA Sebola, BSc, BSc Hons, MSc (UNiversity of Limpopo)

Crop Science

LM Motaung, BSc Agric, BSc Agric Hons, MSc Agric (Agronomy (UP)

Physics

O Tihapane, BSc (NWU), BscHons (NWU)

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, Physics, Chemistry, Electronics, Statistics,, Biochemistry, Microbiology, Geography, Computer Science	<ul style="list-style-type: none"> • English Level 4 • Mathematics Level 4 • Physical Science Level 4 	26
BSc Agric 4 years <ul style="list-style-type: none"> • Agricultural Economics • Animal Science • Plant Science 	<ul style="list-style-type: none"> • English Level 4 • Mathematics Level 4 OR Mathematics Literacy level 5 • Physical Science Level 4 OR Life Sciences Level 4 	20
BSc Agric 4 years Animal Health	<ul style="list-style-type: none"> • English Level 4 • Mathematics Level 4 • Physical Science Level 4 OR Life Science Level 4 	20
BNSc 4 years	<ul style="list-style-type: none"> • English Level 4 • Mathematics Level 4 OR Mathematics Literacy Level 5 • Physical Science Level 4 OR Life Sciences Level 4 • Selection Test 	26

Degree	NSC Subjects	APS Score
Bachelor of Indigenous Knowledge Systems	<ul style="list-style-type: none"> • English level 4 • Matriculation with exemption OR • Recognition of Prior Learning (RPL) OR • GCE certification and an application for conditional exemption with HESA (www.he-enrol.ac.za) • 	20

* Note that Biology will no longer be taking students as a stream/curriculum from 2017. Biology will only be offered at 1st year level, after which they will do either one of the following curricula: Biochemistry, Microbiology, Botany or Zoology.

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)	<ul style="list-style-type: none"> • English Level 3 • Mathematics Level 3 • Life Science Level 3 OR Physical Science 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)	<ul style="list-style-type: none"> • English Level 3 • Mathematics Level 3 • Physical Science Level 3 OR Life Sciences Level 3 	19
Diploma in Animal Science N101M (3 years)	<ul style="list-style-type: none"> • English Level 3 • Mathematics Level 3 OR Mathematical Literacy Level 4 • Physical Science Level 3 OR Life Sciences Level 3 	19

Diploma	NSC Subjects	APS Score
Diploma in Crop Sciences (3 years)	<ul style="list-style-type: none"> • English Level 3 • Mathematics Level 3 OR Mathematical Literacy Level 4 • Physical Science Level 3 OR Life Sciences Level 3 	19

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 Crop Sciences Centre for Animal Health Studies (CAHS)
Environmental and Health Sciences (SoEHS)	Biology stream will no longer be taking new students from 2017 onwards. Biology will only be offered at 1st year level] Botany and Zoology 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
Research and postgraduate studies (SoRPS)	
Centre for Indigenous Knowledge Systems	Indigenous Knowledge Systems (IKS)
Centre for Applied Radiation Science and Technology (CARST)	

Students will only do Biology at 1st year level, after which their streams will be in either of the following curriculum: Biochemistry, Microbiology, Botany or Zoology from 2nd year level

MA.1.6 QUALIFICATIONS, PROGRAMMES AND CURRICULA

DIPLOMAS				
Qualification	Programme and code	Curriculum code	and Method of	NQF level

			delivery	
Diploma in Animal Health	Animal Health -- 2DY B01	Curriculum N301M	Full-time	7
Diploma In Agric In Animal Science	Animal Science – 279 100	N101M	Full-time	7
Diploma In Agric In Crop Sciences	Crop 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	Crop Sciences – 267 – 103	Crop 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 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 Botany – Zoology) 200 174	Botany-Zoology) 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 200 138	Mathematics – Statistics N132M	Full-time	7
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
Bachelor of Indigenous Knowledge Systems	B.IKS – 287 100	Indigenous Knowledge Systems- N402M	Full-time	8

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 Specific 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	AHVM 111	12
AHVM 112	Animal Handling and equipments I	None	8
AHVM 123	Animal Handling and equipments II	AHVM 111, 112	8
AHVM 121	Basic Microbiology for Animal Health	None	12
AHVM 213	Diseases I	AHVM 111, 122,121	12
AHVM 221	Diseases II	AHVM 213, 111,122, 121	16
AHVM 212	Parasitology for Animal Health	AHVM 111, 122, 213	8
AHVM 223	Pharmacology and Toxicology: Animal	AHVM 111, 122,	16

	health	213, 221	
AHVM 222	Obstetrics and Genital Diseases:Animal Health	AHVM 111, 122, 213	16
AHVM 224	Public Health for Animal Health	AHVM 111, 122,121 213, 221, 212	8
AHVM 225	Clinical Laboratory Techniques	AHVM 111, 122,121 213, 221, 212	8
AHVM 226	Basic Microbiology (Animal Science)	AHVM 121	16
AHVM 311	Companion Animal clinical Care I	AHVM 111, 112, 122,121 213, 221, 212, 225	16
AHVM 321	Companion Animal Clinical care II	AHVM 111, 112, 122,121 213, 221, 212, 225	16
AHVM 312	Production Animal clinical care I	AHVM 111, 112, 122,121 213, 221, 212, 225	16
AHVM 322	Production Animal clinical care II	AHVM 111, 122,121 213, 221, 212, 2253, 312	16
AHVM 313	Pathology I	AHVM 111, 122,121 213, 221, 212, 225, 313	8
AHVM 323	Pathology II	AHVM 111, 122,121 213, 221, 212, 225	8
AHVM 314	Epidemiology and Jurisprudence	AHVM 111, 122,121 213, 221, 212, 225	8
AHVM 315	Practical learning and Experiential Learning I	AHVM 111, 122,121 213, 221, 212, 225	8
AHVM325	Practical learning and Experiential Learning II	111, 122,121 213, 221, 212, 225	8
AHVM 324	Scheduled Diseases	AHVM 111, 122,121 213, 221, 212, 225	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 welfare, Handling and equipmentsI	None	12
AHPM 215	Introduction to game and wildlife	None	12
AHPM 314	Animal welfare, Handling and equipmentsII	AHPM 212,221	12
AHPM 311	Diseases I	AHPM 211	16
AHPM 321	Diseases II	AHPM 211	16
AHPM 322	Parasitology: Animal Health	AHPM 311, 322	16
AHPM 323	Pharmacology and Toxicology: Animal Health	AHPM 212, 221, 311, 322	16
AHPM 313	Obstetrics and Genital Diseases: Animal Health	AHPM 212, 221, 311, 322	16
AHPM 324	Veterinary Public Health I	AHPM 212, 221, 311, 322,	8
AHPM 325	Clinical Laboratory Techniques	AHPM 211	8
AHPM 326	Livestock Diseases	AHPM 211 (Animal	8

		Science)	
AHPM 312	Epidemiology	AHPM 311, 322	8
AHPM 327	Veterinary Jurisprudence		8
AHPM 328	Public health for Animal Health II	AHPM 324, 212, 221, 311, 322,	
AHPM 411	Companion Animal Clinical Care I	AHPM 211, 212, 221,222, 313, 323, 314, 325	16
AHPM 421	Companion Animal Clinical Care II	AHPM 211, 212, 221,222, 313, 323, 314, 325, 411	16
AHPM 412	Production Animal Clinical Care I	AHPM 211, 212, 221,222, 313, 323, 314, 325	16
AHPM 422	Production Animal Clinical Care II	AHPM 211, 212, 221,222, 313, 323, 314, 325	16
AHPM 413	Pathology I	AHPM 212, 211, 212, 221,222, 313, 323, 314, 325	8
AHPM 423	Pathology II	AHPM 221, 211, 212, 221,222, 313, 323, 314, 325	8
AHPM 414	Practical learning and Experiential Learning I	AHPM 221, 211, 212, 221,222, 313, 323, 314, 325	8
AHPM 424	Practical learning and Experiential Learning II	AHPM 221, 211, 212, 221,222, 313, 323, 314, 325	8
AHPM 426	Scheduled Diseases	AHPM 311/ AHPM 321	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
WVNS221	<u>Understanding the Natural World</u>	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		16
AECM413	Quantitative Methods in Agricultural Economics	AECM 311 AND AECM 325	16
AECM414	Agricultural Statistics for Research II	AECM 313	16
AECM415	Agribusiness Management	AECM 314	16
AECM421	Farm Planning and Linear Programming	AECM 314	8
AECM422	Agricultural Policy Analysis	NONE	16
AECM423	Agricultural Finance	AECM 314	8
AECM424	Agriculture and Economic Development	AECM 221 AND AECM 311	8
AECM425	Research Project and Seminar II		16
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	56
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	8
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 Sscience	ANSM 211	8
ANSM 423	Practical Experience	None	8
ANSM 424	Poultry Sscience	ANSM 211	16
ANSM 425	Dairy & Meat Ssciences	ANSCM 313 and ANSM 314	16
Diploma in Crop 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	8
CSDM 215	Vegetable Production	CSDM 121	8
CSDM 222	Soil Fertility and Fertilizers	CSDM 211	16
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 323	Elements of Agric. Microbiology	None	16
CSDM 324	Elementary Irrigation	CSDM 211	16
CSDM 325	Practical Crop Production	None	8
BSc Agric in Crop 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 Clasfication	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(This stream will no longer be taking new intakes from 2017 onwards, except 1st year only)

Module Code	Descriptive name	Prerequisites	Credits
SFBM 171	Introduction To Cell Biology	None	12
SFBM 172	Introduction To Biological Concepts	SFBM 171	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 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 or SFBM 171 & SFBM 172	8
BGYM 215	Taxonomy	BGYM 113 & 123 or SFBM 171 & SFBM 172	8
BGYM 216	Ecology and Biostatistics	BGYM 113 & 123 or SFBM 171 & SFBM 172	8
BGYM 225	Immunology and Virology	BGYM 113 & 123 or SFBM 171 & SFBM 172	8
BGYM 226	Physiology & Intro to Entomology & Parasitology	BGYM 113 & 123 or SFBM 171 & SFBM 172	16
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 or SFBM 172	16
BGYM (322) 326	Industrial Microbiology and Biotechnology	BGYM 314	16
BGYM (311) 325	Developmental Biology		16
BGYM 371	UNDERGRADUTE PROJECT		18

Chemistry			
Module code	Descriptive name	Prerequisites	Credits
SFCM 171	Foundation Chemistry I	None	12
SFCM 172	Foundation Chemistry II	SFCM171	12
MCHE 115	Introductory Chemistry	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 or SFCM 171 and SFCM 172	8
MCHE 216	Inorganic Chemistry I	MCHE 114 or MCHE 121 or SFCM 171 and SFCM 172	8
MCHE 221	Organic Chemistry I	MCHE 114 or MCHE 121 or SFCM 171 and SFCM 172	8
MCHE 223	Analytical Chemistry I	MCHE 114 or MCHE 121 or SFCM 171 and	8

		SFCM 172	
MCHE 315	Organic Chemistry II	MCHE 114, MCHE 121 or SFCM 171 and SFCM 172, MCHE 221	16
MCHE 316	Analytical Chemistry II	MCHE 114, MCHE 121, or SFCM 171 and SFCM 172, MCHE 223	16
MCHE 321	Physical Chemistry II	MCHE 114, MCHE 121, or SFCM 171 and SFCM 172, MCHE 215, PHYM 118, PHYM 124, MAYM 116 or 117, MAYM 126 or 127	16
MCHE 322	Inorganic Chemistry II	MCHE 114, MCHE 121, or SFCM 171 and SFCM 172, MCHE 216	16
Biochemistry			
Module code	Descriptive name	Prerequisites	CREDIT
BCHS 211	Introduction to Biochemistry I	MCHE 121 or SFCM 172	8
BCHS 212	Introduction to Biochemistry II	MCHE 121 or SFCM 172	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, BCBS 221 and BCBS 222	16
BCHS 315	Advanced Biochemistry and Molecular Physiology	BCHS 211 and 212, BCBS 221 and BCBS 222	16
BCHS 324	Analytical Biochemistry	BCHS 211 and 212, BCBS 221 and BCBS 222	16
BCHS 325	Project	BCHS 211 and 212, BCBS 221 and BCBS 222	16
Microbiology			
Module code	Descriptive name	Prerequisites	CREDIT
MKBS 211	Introduction to Microbiology	None	8
MKBS 212	Introduction to Microbial Genetics	None	8
MKBS 222	Microbial Diversity and Physiology (Bacteria, Fungi)	MKBS 211 and 212	8
MKBS 223	Introduction to Recombinant DNA Technology and Bioinformatics	MKBS 211 and 212	8
MKBS 316	Microbial Ecology	MKBS 211, MKBS 212, MKBS 222, MKBS 223	16
MKBS 317	Environmental Microbiology and Public Health	MKBS 211, MKBS 212, MKBS 222, MKBS 223	16
MKBS 326	Industrial Microbiology and Biotechnology	MKBS 211, MKBS 212, MKBS 222, MKBS 223	16
MKBS 327	Virology and Immunology	MKBS 211, MKBS 212, MKBS 222, MKBS 223	16

Botany			
Module code	Descriptive name	Prerequisites	CREDIT
PLKN 212	Plant Water Relations	none	16
PLKS 221	Plant Systematics and Phytogeography	none	16
PLKS 311	Plant Physiology: Energy Conservation and Metabolism	none	32
BOTM 321	Plant Ecology	none	32
Zoology			
Module code	Descriptive name	Prerequisites	CREDIT
ZOOM 211	Morphology: Higher Invertebrate and Vertebrates	none	16
DRKS 221	Comparative Animal Physiology	none	16
DRKS 311	Ecology	none	32
ZOOM 321	Veterinarian Parasitology	none	32
Computer Science			
Module code	Descriptive name	Prerequisites	Credits
SFIM 171	Introduction to Computing	None	12
SFIM 172	Programming and Problem Solving	SFIM 171	12
CISM 112	Introduction to Computing	None	12
CISM 122	Programming and Problem Solving	CISM 112 or SFIM 171	12
CISM124	End User Computing	CISM 112 or SFIM 171	12
CISM 213	Data Structures and Algorithm	CISM 122 or SFIM 172	8
CISM 214	Imperative and Object oriented Programming	CISM 122 or SFIM 172	8
CISM 225	Introduction to Operating Systems	CISM 122 or SFIM 172	8
CISM 226	Introduction to Software Engineering	CISM 122 or SFIM 172	8
CISM 313	Introduction to Database Systems	CISM 213,214	16
CISM 314	Principles of Compiler Design	CISM 213, 214	16
CISM 327	Data Communication and Networks	CISM 213,214	16
CISM 326	Artificial Intelligence Fundamentals	CISM 213,214	16
Electronics			
Module code	Descriptive name	Prerequisites	CREDIT
SFEM 171	Electricity, Magnetism and Circuits	Admission into the faculty with Grade 12 Mathematics and Physical Science	12
SFEM 172	Introduction to Electronics	SFEM 171	12
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	ELYM 115 and ELYM 127 or SFEM 171 and SFEM 172	16

ELYM 227	Digital Electronics and systems	ELYM 115 and ELYM 127 or SFEM 171 and SFEM 172	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
SFGM 171	Introduction to Physical Geography	None	12
SFGM 172	Introduction to Human Geography	SFGM171	12
GEOM 113	Introduction to Physical Geography	None	12
GEOM 123	Introduction to Human Geography	None	12
GEOM 214	Aspects of Human Geography	GEOM 113, GEOM 123 or SFGM 171 and SFGM 172	8
GEOM 215	Geographical Statistics and Computers	GEOM 113, GEOM 123 or SFGM 171 and SFGM 172	8
GEOM 224	Aspects of Physical Geography	GEOM 113 , GEOM 123 or SFGM 171 and SFGM 172	8
GEOM 225	Aerial Photography and Remote Sensing	GEOM 113, GEOM 123 or SFGM 171 and SFGM 172	8
GEOM 316	Advanced Human Geography	GEOM 113, GEOM 123, or SFGM 171 and SFGM 172GEOM 214	16
GEOM 317	Advanced Physical Geography	GEOM 113, GEOM 123, or SFGM 171 and SFGM 172GEOM 224	16
GEOM 328	Introduction to Geographical Information Systems	GEOM 113, GEOM 123, or SFGM 171 and SFGM 172 GEOM 215, GEOM 225	16
GEOM 329	The Geography of African Development	GEOM 113, GEOM 123, or SFGM 171 and SFGM 172GEOM 214	16

Applied Mathematics			
Module code	Descriptive name	Prerequisites	Credits
SFAM 171	Introduction to Mechanics	None	12
SFAM 172	Introduction to Numerical Methods and Mathematical Modelling	SFAM171	12
APMM 117	Introduction to Mechanics		12
APMM 127	Introduction to Numerical Methods and Mathematical Modelling		12
APMM 217	Mathematical Modelling	All first year modules in Mathematics and Applied Mathematics	16
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	Introduction to Mechanics	All second year modules in Mathematics and Applied Mathematics	16
Mathematics			
Module code	Descriptive name	Prerequisites	Credits
SFMM 171	Calculus I		
SFMM 172	Calculus II	SFMM171	
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
Indigenous Knowledge Systems			
Module code	Descriptive name	Prerequisites	Credit
All first and second year modules are compulsory for all students			
AGLE 111	Introduction to Academic Literacy	None	12
IKSM 111	The Nature and Patterns of Indigenous Knowledge Systems (IKS) and Innovations	None	12
IKSM 112	Indigenous African Languages and Communication Systems	None	12
IKSM 113	Introduction to Health Care Systems in relation to IKS	None	12
IKSM 114	The role of Indigenous Knowledge Systems in Climate Change	None	12
IKSM 115	Introduction to African Indigenous Life Skills Education	None	12
AGLE 121	Academic Literacy	None	12
IKSM 121	A Historiography of African Indigenous Science and Technology	None	12
IKSM 122	Introduction to the Tools of Indigenous Knowledge Management	None	12
IKSM 123	The Use and Roles of Signs in African Indigenous Communities	None	12
IKSM 124	The Nature and Roles of Indigenous Health Care Providers	None	12
IKSM 125	African Indigenous and Food Security Systems	None	12
IKSM 211	The Rights of Indigenous Peoples	None	12
IKSM 212	African Cultural Astronomy	None	12
IKSM 213	The Nature and Characteristics of African Indigenous Health Care Systems	None	12
IKSM 214	African Indigenous Knowledge Development and Management	None	12
IKSM 215	Implications of Intellectual Property Rights (IPR) on Indigenous Knowledge Systems (IKS)/Traditional Knowledge (TK)	None	12
WVCS 221	Understanding the Cultural World	None	12
IKSM 221	African Indigenous Architecture and Design	None	12
IKSM 222	African Indigenous Approaches to	None	12

	Peace and Conflict Resolution		
IKSM 223	Socio – Cultural Protocols associated with African Traditional Medicine and Health Care Systems	None	12
IKSM 224	African Indigenous Cultural, Bio-Diversity and Heritage	None	12
IKSM 225	Foundations of African Indigenous Education	None	12
WVCS 315*	Man and Society	None	16
IKSM 312	Indigenous Medicinal and Nutritional Significance of Living Organisms	None	16
IKSM 313	Theories of African Indigenous Community Innovation Systems for Sustainable Livelihood	None	16
IKSA 311	Impact of Climate Change on African Indigenous Food Security Systems	None	16
IKSH 311	Comparative Health Care Systems	None	8
IKSH 312	African Indigenous Medicinal and Nutritional Significance of Living Organisms	None	16
IKSH 313	Theories of African Indigenous Community Innovation Systems for Sustainable Livelihood	None	16
IKSH 314	Gender in African Indigenous Health Care Systems	None	8
IKSS 311	Introduction to African Ethno-mathematics	None	16
IKSS 312	Comparative African Indigenous and Western Science and Technology Systems	None	16
IKSC 311	Comparative Western and African Indigenous Life Skills Education	None	16
IKSC 312	Comparative African Indigenous and Western Peace and Conflict Resolution Approaches	None	16
IKSM 321	African Indigenous Metallurgy	None	16
IKSM 322	Indigenous Knowledge (IK) and Innovations in Public Health Care	None	16
IKSM 323	Comparative African Indigenous Textile Technologies	None	16
IKSM 324	Indigenous Knowledge and Renewable Energy Sources for Sustainable Livelihood	None	16
IKSA 321	African Indigenous Agriculture and Sustainable Community Livelihood and Development in Southern Africa	None	16
IKSA 322	Comparative African Indigenous Cultural, Bio-diversity and Heritage	None	16
IKSA 323	Comparative African Indigenous and Western Food Security Systems	None	16
IKSC 321	African Traditional Governance and Democracy	None	16

IKSC 322	African Indigenous Music and Dance	None	16
IKSC 323	Gender in African Indigenous Arts and Culture-	None	16
IKSH 321	African Indigenous Health Care Providers	None	16
IKSH 322	Indigenous Knowledge and Innovations in Public Health Care 1	None	16
IKSH 323	African Traditional Medicine and Health Care Systems 1	None	16
IKSS 321	African Indigenous Metallurgy 1	None	16
IKSS 322	African Indigenous Ethno mathematics 11	None	16
IKSS 323	Comparative African Indigenous Textile Technologies	None	16
IKSS 324	Indigenous Knowledge and Renewable Energy Sources for Sustainable Livelihood I-	None	16
IKSM 411*	Basic Research Methods	None	16
IKSM 412*	Qualitative and Quantitative Research in IKS	None	16
IKSM 413	African Traditional Governance and Democracy	None	16
IKSA 413	Indigenous Knowledge and Renewable Energy Sources for Sustainable Livelihood II-	None	16
IKSC 413	African Indigenous Music and Drama-	None	16
IKSH 411	African Traditional Medicine and Health Care Systems 11	None	16
IKSS 413	African Indigenous Metallurgy II	None	16
IKSM 421*	Internship and Research Project	None	64
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 321	General Nursing Sciences 111 & Practicals	All 3 rd year modules	18
MIYM 422	Midwifery 11 & Practicals	All 3 rd year modules	18
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 121	Nursing Management 1	None	12
NEDM 122	Nursing Education 1	None	12
	Academic Literacy 1	None	12
NADM 211	Nursing Management 11 and Practicals	NADM 112	24
CHNM 211	Community Nursing Science	CHNM 111	30
	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	30
SOCL 111	Sociology	SOCL 131/141	12
MANM 121	Management 1	None	12
	Understanding the world	None	12
NADM 311	Nursing Management 11 and Practicals	NADM 211	18
CHNM 311	Community Nursing Science	CHNM 211, CHNM 222	18
HCOM 111	Public Relations	None	12
NADM 322	Nursing Management 111 and Practicals		18
NRPM 322	Nursing Research Project	NRMM 111	12
CHNM 322	Community Nursing Science 111 and Practicals		30

Physics

Module code	Descriptive name	Prerequisites	Credits
SFPM 171	Mechanics and Heat Energy	Admission into the faculty with Grade 12 Mathematics and Physical Science	12
SFPM 172	Basic Electromagnetism and Modern Physics	A pass in the extended programme year 1 Physics and Mathematics modules	12
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 129	Introduction to Basic Physics Concepts	50% Grade 12 Mathematics. Pass in Matric physical Science	12
PHYM 215	Mechanics and Thermal Physics	PHYM 118 & PHYM 128, or SFPM 171 & SFPM 172	8

PHYM 216	Atomic Physics	PHYM 118 & PHYM 128, or SFPM 171 & SFPM 172	8
PHYM 221	Waves and Quantum Mechanics	PHYM 118 & PHYM 128, or SFPM 171 & SFPM 172	8
PHYM 222	Electricity and Magnetism	PHYM 118 & PHYM 128, or SFPM 171 & SFPM 172	8
PHYM 315	Classical Mechanics	All second year modules in Physics	8
PHYM 316	Solid State Physics	All second year modules in Physics	8
PHYM 317	Quantum Mechanics	All second year modules in Physics	8
PHYM 318	Project and Research	All second year modules in Physics	8
PHYM 321	Electromagnetism	All second year modules in Physics	8
PHYM 322	Nuclear Physics	All second year modules in Physics	8
PHYM 323	Statistical Physics	All second year modules in Physics	8
PHYM 324	Project and Research	All second year modules in Physics	8

MA .1.7.4 CURRICULUM

DIPLOMA IN AGRICULTURE IN ANIMAL HEALTH N301M – 2DY B01

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 (X)	12	AHVM 213 (H)	12	AHVM 316 (H)	12
AHVM 111 (H)	12	AHVM 212 (H)	8	AHVM317 (H)	12
AHVM 112 (H)	8	ANDM 211 (X)	16	AHVM 313 (H)	8
AEDM 111 (X)	12	ANDM 212 (X)	8	AHVM 318 (H)	12
MAYM 115 (X)	12	AXDM 211 (X)	16	AHVM 319 (H)	12
		ANDM 213 (X)	8		
Total 1st sem	56	Total 1st sem	68	Total 1st sem	56
Year level 1		Year level 2		Year level 3	
Second sem		Second sem		Second sem	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 121 (X)	12	AHVM 227 (H)	12	AHVM 326 (H)	12
AHVM 121 (H)	12	AHVM 222 (H)	16	AHVM 327 (H)	12
AHVM 122 (H)	12	AHVM 223 (H)	16	AHVM 323 (H)	8
AHVM 123 (H)	8	AHVM 224 (H)	8	AHVM 324 (H)	8
ANDM 122 (X)	8	AHVM 225 (H)	8	AHVM 328 (H)	12
MAYM 125 (X)	12	ANDM 225 (X)	16		
Total 2nd sem	64	Total 2nd sem	76	Total 2nd sem	52
Total level 1	120	Total level 2	144	Total level 3	108
Total credits for the curriculum 372					

***Core modules are indicated with (H) and ancillary modules with (X)**

After completion of the 3-year Diploma, a student can either exit with a diploma qualification or could proceed to register for a BSc Agric. Successful applicants into BSc Programme will NOT be credited for modules taken and passed during the course of the Diploma Programme. A Diploma candidate is, therefore, required to complete BSc programme in the minimum period of 4 years.

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

*Core modules are indicated with (H) and ancillary modules with (X)

After completion of the 3-year Diploma, a student can either exit with a diploma qualification or could proceed to register for a BSc Agric. Successful applicants into BSc Programme will NOT be credited for modules taken and passed during the course of the Diploma Programme. A Diploma candidate is, therefore, required to complete the BSc programme in the minimum period of 4 years.

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

*Core modules are indicated with (H) and ancillary modules with (X)

After completion of the 3-year Diploma, a student can either exit with a diploma qualification or could proceed to register for a BSc Crop Agric. Successful applicants into BSc Programme will NOT be credited for modules taken and passed during the course of the Diploma Programme. A Diploma candidate is, therefore, required to complete the BSc programme in the minimum period of 4 years.

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 (X)	12	AHPM 213 (H)	12	AHPM 311 (H)	16	AHPM 411 (H)	16
BGYM 113 (X)	12	AHPM 214 (H)	12	AHPM 312 (H)	8	AHPM 412 (H)	16
MCHE 114 (X)	12	ANSM 214 (X)	8	AHPM 313 (H)	16	AHPM 413 (H)	8
MAYM 116 (X)	12	AEXM 211 (X)	16	AHPM 316 (H)	12	AHPM 414 (H)	8
AECM 111 (X)	12	WVNS 211 (X)	12	ANSM 311 (X)	16	AHPM 415 (H)	16
		AHPM 215 (H)	12	AHPM 315 (H)	8		
Total 1st semester	60	Total 1st semester	72	Total 1st semester	76	Total 1st semester	64
Second semester		Second semester		Second semester		Second semester	
AGLE 121 (X)	12	AHPM 224 (H)	12	AHPM 321 (H)	16	AHPM 421 (H)	16
ANSM 121 (X)	12	AHPM 223 (H)	12	AHPM 322 (H)	16	AHPM 422 (H)	16
BGYM 123 (X)	12	ANSM 222 (X)	8	AHPM 323 (H)	16	AHPM 423 (H)	8
MCHE 121 (X)	12	ANSM 223 (X)	16	AHPM 328 (H)	8	AHPM 424 (H)	8
PHYM 129 (X)	12	ANSM 224 (X)	8	AHPM 325 (H)	8	AHPM 425 (H)	16
		WVAS 221 (X)	12	AHPM 327 (H)	12	AHPM 426 (H)	8
Total 2nd sem	60	Total 2nd semester	68	Total 2nd semester	76	Total 2nd semester	72
Total Year level 1	120	Total Year level 2	140	Total Year level 3	152	Total Year level 4	136
Total credits for the curriculum 548							

*Core modules are indicated with (H) and ancillary modules with (X)

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 to become Professional Animal Scientists within the Agricultural Sector and related industries.

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 (X)	12	ANSM 211 (H)	16	AECM 314 (X)	08	ANSM 411 (H)	16
BGYM 113 (X)	12	AHPM 212 (X)	16	ANSM 311 (H)	16	ANSM 412 (H)	16
MAYM 116 (X)	12	CSPM 211 (X)	16	ANSM 312 (H)	16	ANSM 413 (H)	16
AECM 111 (X)	12	AHPM 211 (X)	16	ANSM 313 (H)	08	ANSM 414 (H)	08
AGLE 111 (X)	12	WVNS 211 (X)	12	ANSM 314 (H)	16		
Total 1st sem	60	Total 1st sem	76	Total 1st sem	64	Total 1st sem	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 121 (X)	12	ANSM 223 (H)	16	ANSM 321 (H)	16	ANSM 421 (H)	16
BGYM 123 (X)	12	AHPM 221 (X)	08	ANSM 322 (H)	08	ANSM 422 (H)	08
PHYM 129 (X)	12	ANSM 222 (H)	08	ANSM 323 (H)	16	ANSM 423 (H)	08
ANSM 121 (H)	12	CSPM 221 (X)	16	ANSM 324 (H)	16	ANSM 424 (H)	16
AGLE 121 (X)	12	WVAS 221 (X)	12	AHPM 326 (X)	08	ANSM 425 (H)	16
				AEXM 324 (X)	08		
Total 2nd sem	60	Total 2nd sem	60	Total 2nd sem	72	Total 2nd sem	64
Total level 1	120	Total level 2	136	Total level 3	136	Total level 4	120
Total credits for the curriculum 512							

*Core modules are indicated with (H) and ancillary modules with (X)

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 development of the agricultural sector, agricultural business and rural communities.

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 (X)	12	AEXM211 (H)	16	AECM311 (H)	16	AECM411 (H)	8
MCHE114 (X)	12	AEXM212 (H)	8	AECM312 (H)	8	AECM412 (H)	16
AGLE111 (X)	12	AECM213 (H)	8	CSPM313 (X)	16	AECM413 (H)	16
AECM111 (H)	12	CSPM211 (X)	16	AECM313 (H)	16	AECM414 (H)	16
MAYM116 (X)	12	ANSM211 (X)	16	AECM314 (H)	8	AECM415 (H)	16
		WVNS211 (X)	12				
Total 1st sem	60	Total 1st sem	76	Total 1st sem	64	Total 1st sem	72
Second semester		Second semester		Second semester		Second semester	
MCHE121 (X)	12	AECM221 (H)	8	AECM321 (H)	16	AECM421 (H)	8
BGYM123 (X)	12	AEXM222 (H)	8	AECM322 (H)	16	AECM422 (H)	16
PHYM129 (X)	12	CSPM221 (X)	16	AECM323 (H)	8	AECM423 (H)	8
ANSM121 (X)	12	ANSM223 (X)	16	AEXM324 (H)	8	AECM424 (H)	8
AGLE121 (X)	12	AECM223 (H)	8	AECM325 (H)	8	AECM425 (H)	16
		WVAS221 (X)	12				
Total 2nd sem	60	Total 2nd sem	68	Total 2nd sem	56	Total 2nd sem	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							

***Core modules are indicated with (H) and ancillary modules with (X)**

After completion of a 3-year Diploma, a student can either exit with a diploma qualification or proceed to register for a BSc Agric Economics degree. Successful applicants into the BSc Programme will NOT be credited with any modules taken and passed during the course of the Diploma Programme. A Diploma candidate is, therefore required to complete the BSc programme in the minimum period of 4 years.

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 Horticulture, Soil Science, and Environment and Land Management towards the betterment of the agricultural sector regionally, nationally 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 (X)	12	CSPM211 (H)	16	CSPM311 (H)	8	CSPM411 (H)	8
MCHE 114 (X)	12	AEXM211 (X)	16	CSPM312 (H)	16	CSPM412/ CSPM415 (H)	16
MAYM 116 (X)	12	ANSM 211 (X)	16	CSPM313 (H)	16	CSPM413/ CSPM414 (H)	8
AGLE 111 (X)	12	CSPM212 (H)	12	AECM314 (X)	8	CSPM417 (H)	8
AECM 111 (X)	12	CSPM213 (H)	8	ANSM312 (X)	16	CSPM418 (H)	16
		WVNS 211 (X)	12				
Total 1st sem	60	Total 1st sem	80	Total 1st sem	64	Total 1st sem	56
Second semester		Second semester		Second semester		Second semester	
Module code	Cr	Module code	Cr	Module code	Cr	Module code	Cr
BGYM 123 (X)	12	CSPM221 (H)	16	CSPM321 (H)	8	CSPM421 (H)	16
MCHE 121 (X)	12	CSPM222 (H)	16	CSPM322 (H)	16	CSPM422/ CSPM424 (H)	16
PHYM 129 (X)	12	CSPM223 (H)	12	CSPM323 (H)	16	CSPM427 (H)	8
AGLE 121 (X)	12	CSPM224 (H)	16	CSPM324 (H)	16	CSPM428 (H)	16
ANSM121 (X)	12	WVAS221 (X)	12	CSPM325 (H)	8		
Total 2nd semester	60	Total 2nd semester	72	Total 2nd semester	64	Total 2nd semester	56
Total level 1	120	Total level 2	152	Total level 3	128	Total level 4	112
Total credits for the curriculum					512		

*Core modules are indicated with (H) and ancillary modules with (X)

Bachelor of Indigenous Knowledge Systems (B. IKS) N402M – 287 100

Purpose

This is a multi-disciplinary Qualification which has been designed to prepare learners with the necessary knowledge, skills and values of Indigenous Knowledge Systems (IKS), which will enable them to pursue careers as practitioners in various fields and contexts.

The Qualification is based on a holistic approach to understanding IKS and lays a solid foundation for learners to gain academic and practical competencies which will enable them to apply theoretical knowledge and understanding in a range of contexts which includes but is not limited to health sciences, traditional leadership, tourism, communication, agriculture, nature conservation, arts and culture, heritage, education, law, human and social sciences, physical planning and construction.

The multi-disciplinary nature of this Qualification will enable learners to promote IKS within various communities of practice, through being conversant with the concepts, theories, philosophies and values of IKS. In addition, the structure of the Qualification provides scope for electives in a domain of IKS, which is relevant to the learner's area of interest or research. The Qualification will also equip learners with sufficient research competencies to undertake further studies at a higher level.

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 (X)	12	IKSM 211 (H)	12	WVCS 315 (X)	16	IKSM 411 (H)	16
IKSM 111 (H)	12	IKSM 212 (H)	12	Select 3 modules from the following IKSS 311 (H)	16	IKSM 412 (H)	16
IKSM 112 (H)	12	IKSM 213 (H)	12	IKSS 312 (H)	16	Select 1 module from the following IKSM 413 (H)	16
IKSM 113 (H)	12	IKSM 214 (H)	12	IKSA 311 (H)	16	IKSS 413 (H)	16
IKSM 114 (H)	12	IKSM 215 (H)	12	IKSC 311 (H)	16	IKSA 413 (H)	16
IKSM 115(H)	12			IKSC 312 (H)	16	IKSC 413 (H)	16
				IKSH 311 (H)	16	IKSH 411 (H)	16
				IKSH 312 (H)	16		
				IKSH 313 (H)	16		
				IKSH 314 (H)	16		
				IKSM 311 (H)	16		
				IKSM 312 (H)	16		
				IKSM 313 (H)	16		

Total 1 st sem	72	Total 1 st seme	60	Total 1 st seme	64	Total 1 st seme	48
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
AGLE 121 (X)	12	IKSM 221(H)	12	Select 4 modules from the following IKSM 321 (H)	16	IKSM 421 (H)	64
IKSM 121 (H)	12	WVCS 221(X)	12	IKSM 322 (H)	16		
IKSM 122 (H)	12	IKSM 222 (H)	12	IKSM 323 (H)	16		
IKSM 123 (H)	12	IKSM 223 (H)	12	IKSM 324 (H)	16		
IKSM 124 (H)	12	IKSM 224 (H)	12	IKSS 321 (H)	16		
IKSM 125 (H)	12	IKSM 225 (H)	12	IKSS 322 (H)	16		
				IKSS 323 (H)	16		
				IKSS 324 (H)	16		
				IKSA 321 (H)	16		
				IKSA 322 (H)	16		
				IKSA 323 (H)	16		
				IKSH 321 (H)	16		
				IKSH 322 (H)	16		
				IKSH 323 (H)	16		
				IKSC 321 (H)	16		
				IKSC 322 (H)	16		
				IKSC 323 (H)	16		
Total 2nd sem	72	Total 2nd sem	72	Total 2nd sem	64	Total 2nd sem	64
Total year 1	144	Total year 2	132	Total year 3	128	Total year 4	112

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	NCHM211 (H)	12	GNSM211 (H)	12	GNSM311 (H)	12
SOCL111 (X)	12	PHMM112 (H)	12	MIYM311 (H)	24	MIYM411 (H)	18
NCHM111 (H)	24	BIYM 112 (X)	12	PNSM311 (H)	18	PNSM411 (H)	18
FNSM111 (H)	18	PSYC111 (X)	12	NCHM311 (H)	6	NRMM411 (H)	12
EPPM111 (H)	6	GNSM111	24				
AGLE111 or TAG TEST (X)	12						
Total 1st sem	84	Total 1st seme	72	Total 1st sem	60	Total 1st sem	60
Second semester		Second semester		Second semester		Second semester	
BIYM 121 (X)	12	NCHM222 (H)	24	GNSM222 (H)	12	GNSM321 (H)	18
SOCL121 (X)	12	EPPM221 (H)	6	MIYM322 (H)	24	MIYM422 (H)	18
NCHM122 (H)	12	BIYM124 (X)	12	PNSM322 (H)	18	PNSM422 (H)	18
FNSM122 (H)	18	PSYC121 (X)	12	NCHM322 (H)	6	NRPM422 (H)	12
AGLE121 (X)	12	GNSM122 (H)	18				
Total 2nd sem	66	Total 2nd sem	72	Total 2nd sem	60	Total 2ndsem	66
Total level 1	150	Total level 1	144	Total level 1	120	Total level 1	126
Total credits for the curriculum		540					

*Core modules are indicated with (H) and ancillary modules with (X)

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			

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

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 171 (H)	6	SFCM 172 (H)	6	WVNS 211 (X)	12	APMM 317 (H)	16
SFMM171 (X)	6	SFMM172 (X)	6	APMM 217 (H)	16	APMM 318 (H)	16
SFPM 171 (X)	6	SFPM 172 (X)	6	MCHE 215 (H)	8	MCHE 315 (H)	16
AGLE 111 (X)	12			MCHE 216 (H)	8	MCHE 316 (H)	16
SFAM 171 (H)	6	SFAM 172 (H)	6	MAYM 217 (X)	16		
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFCM 171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	APMM 327 (H)	16
SFMM 171 (X)	6	SFCM 172 (H)	6	APMM 227 (H)	16	APMM 328 (H)	16
SFPM 171 (X)	6	SFMM 172 (X)	6	MCHE 221 (H)	8	MCHE 321 (H)	16
SFAM 171 (H)	6	SFPM 172 (X)	6	MCHE 223 (H)	8	MCHE 322 (H)	16
		SFAM 172 (H)	6	MAYM 227 (X)	16		
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

2. BSc Extended (Applied Mathematics - Electronics) 200-193 N302M

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	C R	CODE	C R	CODE	C R	CODE	C R
SFAM 171 (H)	6			WVNS 211 (X)	12	APMM 317 (H)	16
SFMM171 (X)	6	SFAM 172 (H)	6	APMM 217 (H)	16	APMM 318 (H)	16
SFPM 171 (X)	6	SFMM172 (X)	6	MAYM 217 (X)	16	ELYM 315 (H)	16
AGLE 111 (X)	12	SFPM 172 (X)	6	ELYM 215 (H)	16	ELYM 316 (H)	16
SFEM 171 (H)	6	SFEM 172 (H)	6				
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFAM 171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	APMM 327 (H)	16
SFMM 171 (X)	6	SFAM 172 (H)	6	APMM 227 (H)	16	APMM 328 (H)	16
SFPM 171 (X)	6	SFMM 172 (X)	6	MAYM 227 (X)	16	ELYM 327 (H)	16
SFEM 171 (H)	6	SFPM 172 (X)	6	ELYM 227 (H)	16	ELYM 328 (H)	16
		SFEM 172 (H)	6				
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

3. BSc Extended (Applied Mathematics - Physics) 200-194 N302M

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
SFIM 171 (X)	6	SFIM 172 (X)	6	WVNS 211 (X)	12	APMM 317 (H)	16
SFMM171 (X)	6	SFMM172 (X)	6	APMM 217 (H)	16	APMM 318 (H)	16
SFPM 171 (H)	6	SFPM 172 (H)	6	PHYM 215 (H)	8	PHYM 315 (H)	8
AGLE 111 (X)	12			PHYM 216 (H)	8	PHYM 316 (H)	8
SFAM 171 (H)	6	SFAM 172 (H)	6	MAYM 217 (X)	16	PHYM 317 (H)	8
						PHYM 318 (H)	8
Sem 1 Total	36		24	Total 1st Sem	60	Total 1st Sem	64
SEMESTER 2				SEMESTER 2			
SFIM 171 (X)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	APMM 327 (H)	16
SFMM171 (X)	6	SFIM 172	6	APMM 227 (H)	16	APMM 328 (H)	16
SFPM 171 (H)	6	SFMM172	6	PHYM 221 (H)	8	PHYM 321 (H)	8
SFAM 171 (H)	6	SFPM 172 (H)	6	PHYM 222 (H)	8	PHYM 322 (H)	8
		SFAM 172 (H)	6	MAYM 227 (X)	16	PHYM 323 (H)	8
						PHYM 324 (H)	8
Sem 2 Total	24	Sem 2 Total	36	Total 2nd Sem	60	Total 2nd Sem	64
Year 1 Total	60	Year 2 Total	60	Total Year Level 1	120	Total Year Level 1	128
Total credits for the curriculum 368							

*Core modules are indicated with (H) and ancillary modules with (X)

4.BSc Extended (Chemistry - Mathematics) 200-195 N302M

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	Cr	CODE	Cr	CODE	Cr	CODE	Cr
SFCM171 (H)	6	SFCM 172 (H)	6	WVNS 211 (X)	12	MAYM 317 (H)	16
SFMM171 (H)	6	SFMM 172 (H)	6	MCHE 215 (H)	8	MAYM 318 (H)	16
SFPM 171 (X)	6	SFPM 172 (X)	6	MCHE 216 (H)	8	MCHE 315 (H)	16
AGLE 111 (X)	12	SFIM 172 (X)	6	MAYM 217 (X)	16	MCHE 316 (H)	16
SFIM 171 (X)	6			PHYM 215 (H)	8		
				PHYM 216 (H)	8		
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFCM171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	MAYM 327 (H)	16
SFMM171 (H)	6	SFCM 172 (H)	6	MCHE 221 (H)	8	MAYM 328 (H)	16
SFPM 171 (X)	6	SFMM 172 (H)	6	MCHE 223 (H)	8	MCHE 321 (H)	16
SFIM 171 (X)	6	SFPM 172 (X)	6	MAYM 227 (X)	16	MCHE 322 (H)	16
		SFIM 172 (X)	6	PHYM 221 (H)	8		
				PHYM 222 (H)	8		
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

5. BSc Extended (Electronics – Physics) 200-196 N302M

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFEM 171 (H)	6	SFEM 172 (H)	6	WVNS 211 (X)	12	PHYM 315 (H)	8
SFMM171 (X)	6	SFMM172 (X)	6	ELYM 215 (H)	16	PHYM 316 (H)	8
SFPM 171 (H)	6	SFPM 172 (H)	6	PHYM 215 (H)	8	PHYM 317 (H)	8
SFIM 171 (X)	6	SFIM 172 (X)	6	PHYM 216 (H)	8	PHYM 318 (H)	8
AGLE 111 (X)	12			MAYM 217 (X)	16	ELYM 315 (H)	16
						ELYM 316 (H)	16
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2							
SFEM 171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	PHYM 321 (H)	8
SFMM171 (X)	6	SFEM 172 (H)	6	ELYM 227 (H)	16	PHYM 322 (H)	8
SFPM 171 (H)	6	SFMM 172 (X)	6	PHYM 221 (H)	8	PHYM 323 (H)	8
SFIM 171 (X)	6	SFPM 172 (H)	6	PHYM 222 (H)	8	PHYM 324 (H)	8
		SFIM 172 (X)	6	MAYM 227 (X)	16	ELYM 327 (H)	16
						ELYM 328 (H)	16
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

6.BSc Extended (Computer Science - Chemistry) 200-197 N302M

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 171 (H)	6	SFCM 172 (H)	6	WVNS 211 (X)	12	MCHE 315 (H)	16
SFMM171 (X)	6	SFIM 172 (H)	6	CISM 213 (H)	8	MCHE 316 (H)	16
AGLE 111 (X)	12	SFMM 172 (X)	6	CISM 214 (H)	8	CISM 313 (H)	16
SFPM 171 (X)	6	SFPM 172 (X)	6	MAYM 217 (X)	16	CISM 314 (H)	16
SFIM 171 (H)	6			MCHE 215 (H)	8		
				MCHE 216 (H)	8		
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2							
SFCM 171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	MCHE 321 (H)	16
SFMM 171 (X)	6	SFCM 172 (H)	6	CISM 225 (H)	8	MCHE 322 (H)	16
SFPM 171 (X)	6	SFMM 172 (H)	6	CISM 226 (H)	8	CISM 326 (H)	16
SFIM 171 (H)	6	SFPM 172 (X)	6	MAYM 227 (X)	16	CISM 327 (H)	16
		SFIM 172 (X)	6	MCHE 221 (H)	8		
				MCHE 223 (H)	8		
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

7. Curriculum: Extended (Computer Science - Physics) 200-200 N302M

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
SFEM 171 (X)	6	SFEM 172 (X)	6	WVNS 211 (X)	12	CISM 313 (H)	16
SFMM171 (X)	6	SFMM172 (X)	6	CISM 213 (H)	8	CISM 314 (H)	16
SFPM 171 (H)	6	SFPM 172 (H)	6	CISM 214 (H)	8	PHYM 315 (H)	8
AGLE 111 (X)	12	SFIM 172 (H)	6	PHYM 215 (H)	8	PHYM 316 (H)	8
SFIM 171 (H)	6			PHYM 216 (H)	8	PHYM 317 (H)	8
				MAYM 217 (X)	16	PHYM 318 (H)	8
	36		24		60		64
Second semester		Second semester		Second semester		Second semester	
SFEM 171 (X)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	CISM 326 (H)	16
SFMM171 (X)	6	SFEM 172 (X)	6	CISM 225 (H)	8	CISM 327 (H)	16
SFPM 171 (H)	6	SFMM 172 (X)	6	CISM 226 (H)	8	PHYM 321 (H)	8
SFIM 171 (H)	6	SFPM 172 (H)	6	PHYM 221 (H)	8	PHYM 322 (H)	8
		SFIM 172 (H)	6	PHYM 222 (H)	8	PHYM 323 (H)	8
				MAYM 227 (X)	16	PHYM 324 (H)	8
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
Total credits for the curriculum		368					

*Core modules are indicated with (H) and ancillary modules with (X)

8.BSc Extended (Applied Mathematics - Mathematics) 200-158 N303M

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFIM 171 (X)	6	SFIM 172 (X)	6	WVNS 211 (X)	12	APMM 317 (H)	16
SFMM171 (H)	6	SFPM 172 (X)	6	APMM 217 (H)	16	APMM 318 (H)	16
SFPM 171 (X)	6	SFMM172 (H)	6	PHYM 215 (X)	8	MAYM 317 (H)	16
AGLE 111 (X)	12	SFAM 172 (H)	6	PHYM 216 (X)	8	MAYM 318 (H)	16
SFAM 171 (H)	6			MAYM 217 (H)	16		
SEM 1 TOTAL	36	SEM 1 TOTAL	24	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFIM 171 (X)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	APMM 327 (H)	16
SFMM 171 (H)	6	SFIM 172 (X)	6	APMM 227 (H)	16	APMM 328 (H)	16
SFPM 171 (X)	6	SFMM 172 (H)	6	PHYM 221 (X)	8	MAYM 327 (H)	16
SFAM 171 (H)	6	SFPM 172 (X)	6	PHYM 222 (X)	8	MAYM 328 (H)	16
		SFAM 172 (H)	6	MAYM 227 (H)	16		
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL		368					

*Core modules are indicated with (H) and ancillary modules with (X)

9. Curriculum: Extended (Chemistry - Physics) 200-160 N303M

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFCM171 (H)	6	SFCM 172 (H)	6	WVNS 211 (X)	12	PHYM 315 (H)	8
SFMM171 (X)	6	SFMM172 (X)	6	MCHE 215 (H)	8	PHYM 316 (H)	8
SFPM 171 (H)	6	SFPM 172 (H)	6	MCHE 216 (H)	8	PHYM 317 (H)	8
AGLE 111 (X)	12	SFIM 172 (X)	6	MAYM 217 (X)	16	PHYM 318 (H)	8
SFIM 171 (X)	6			PHYM 215 (H)	8	MCHE 315 (H)	16
				PHYM 216 (H)	8	MCHE 316 (H)	16
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFCM171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	PHYM 321 (H)	8
SFMM171 (X)	6	SFCM 172 (H)	6	MCHE 221 (H)	8	PHYM 322 (H)	8
SFPM 171 (H)	6	SFMM 172 (X)	6	MCHE 223 (H)	8	PHYM 323 (H)	8
SFIM 171 (X)	6	SFPM 172 (H)	6	MAYM 227 (X)	16	PHYM 324 (H)	8
		SFIM 172 (X)	6	PHYM 221 (H)	8	MCHE 321 (H)	16
				PHYM 222 (H)	8	MCHE 322 (H)	16
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

10. Curriculum: Extended (Electronics - Mathematics) 200 163 N303M

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFEM 171 (H)	6	SFEM 172 (H)	6	WVNS 211 (X)	12	MAYM 317 (H)	16
SFMM171 (H)	6	SFMM172 (H)	6	ELYM 215 (H)	16	MAYM 318 (H)	16
SFPM 171 (X)	6	SFPM 172 (X)	6	APMM 217 (X)	16	ELYM 315 (H)	16
AGLE 111 (X)	12	SFAM 172 (X)	6	MAYM 217 (H)	16	ELYM 316 (H)	16
SFAM 171 (X)	6						
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFEM 171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	MAYM 327 (H)	16
SFMM 171 (H)	6	SFEM 172 (H)	6	ELYM 227 (H)	16	MAYM 328 (H)	16
SFPM 171 (X)	6	SFMM 172 (H)	6	APMM 227 (X)	16	ELYM 327 (H)	16
SFAM 171 (X)	6	SFPM 172 (X)	6	MAYM 227 (H)	16	ELYM 328 (H)	16
		SFAM 172 (X)	6				
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

11.BSc Extended (Mathematics - Physics) 200-164 N303M

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFEM 171 (X)	6	SFEM 172 (X)	6	WVNS 211 (X)	12	MAYM 317 (H)	16
SFMM171 (H)	6	SFMM172 (H)	6	ELYM 215 (X)	16	MAYM 318 (H)	16
SFPM 171 (H)	6	SFPM 172 (H)	6	PHYM 215 (H)	8	PHYM 315 (H)	8
AGLE 111 (X)	12	SFIM 172 (X)	6	PHYM 216 (H)	8	PHYM 316 (H)	8
SFIM 171 (X)	6			MAYM 217 (H)	16	PHYM 317 (H)	8
						PHYM 318 (H)	8
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFEM 171 (X)	6			WVNS 221	12	MAYM 327 (H)	16
SFMM171 (H)	6	SFEM 172 (X)	6	ELYM 227	16	MAYM 328 (H)	16
SFPM 171 (H)	6	SFMM172 (H)	6	PHYM 221 (H)	8	PHYM 321 (H)	8
SFIM 171 (X)	6	SFPM 172 (H)	6	PHYM 222 (H)	8	PHYM 322 (H)	8
		SFIM 172 (X)	6	MAYM 227 (H)	16	PHYM 323 (H)	8
		AGLE 121 (X)	12			PHYM 324 (H)	8
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

12. Curriculum: Extended (Computer Science - Electronics) 200-161 N303M

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFEM 171 (H)	6	SFEM 172 (H)	6	WVNS 211 (X)	12	CISM 313 (H)	16
SFMM171 (X)	6	SFMM172 (X)	6	CISM 213 (H)	8	CISM 314 (H)	16
SFIM 171 (H)	6	SFIM 172 (H)	6	CISM 214 (H)	8	ELYM 315 (H)	16
SFPM 171 (X)	6	SFPM 172 (X)	6	ELYM 215 (H)	16	ELYM 316 (H)	16
AGLE 111 (X)	12			MAYM217 (X)	16		
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFEM 171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	CISM 326 (H)	16
SFMM171 (X)	6	SFEM 172 (H)	6	CISM 225 (H)	8	CISM 327 (H)	16
SFIM 171 (H)	6	SFMM172 (X)	6	CISM 226 (H)	8	ELYM 327 (H)	16
SFPM 171 (X)	6	SFIM 172 (H)	6	ELYM 227 (H)	16	ELYM 328 (H)	16
		SFPM 172 (X)	6	MAYM 227 (X)	16		
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

13. BSc Extended (Computer Science - Mathematics) 200-162 N303M

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
CODE	CR	CODE	CR	CODE	CR	CODE	CR
SFAM 171 (X)	6	SFAM 172 (X)	6	WVNS 211 (X)	12	CISM 313 (H)	16
SFMM171 (H)	6	SFMM172 (H)	6	CISM 213 (H)	8	CISM 314 (H)	16
SFPM 171 (X)	6	SFPM 172 (X)	6	CISM 214 (H)	8	MAYM 317 (H)	16
SFIM 171 (H)	6	SFIM 172 (H)	6	MAYM 217 (H)	16	MAYM 318 (H)	16
AGLE 111 (X)	12			APMM 217 (X)	16		
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2							
SFAM 171 (X)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	CISM 326 (H)	16
SFMM171 (H)	6	SFAM 172 (X)	6	CISM 225 (H)	8	CISM 327 (H)	16
SFPM 171 (X)	6	SFMM172 (H)	6	CISM 226 (H)	8	MAYM 327 (H)	16
SFIM 171 (H)	6	SFPM 172 (X)	6	MAYM 227 (H)	16	MAYM 328 (H)	16
		SFIM 172 (H)	6	APMM 227 (X)	16		
Sem 2 Total	24	Sem 2 Total	36	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

14. Curriculum: Extended (Biology- Chemistry) 200 159 N303M

Year 1		Year 2		Year 3		Year 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
Code	Cr	Code	Cr	Code	Cr	Code	Cr
SFBM 171 (H)	6	SFBM 172 (H)	6	BGYM 213 (H)	8	BGYM 313 (H)	16
SFCM171 (H)	6	SFCM 172 (H)	6	BGYM 214 (H)	8	BGYM 314 (H)	16
SFMM171 (X)	6	SFMM 172 (X)	6	MCHE 215 (H)	8	MCHE 315 (H)	16
SFPM 171 (X)	6	SFPM 172 (X)	6	MCHE 216 (H)	8	MCHE 316 (H)	16
AGLE 111 (X)	12			PHYM 215 (X)	8		
				PHYM 216 (X)	8		
				WVNS 211 (X)	12		
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFBM 171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	MCHE 322 (H)	16
SFCM171 (H)	6	SFBM 172 (H)	6	MCHE 221 (H)	8	MCHE 321 (H)	16
SFMM171 (X)	6	SFCM 172 (H)	6	MCHE 223 (H)	8	BGYM 326 (H)	32
SFPM 171 (X)	6	SFMM 172 (X)	6	BGYM 227 (H)	8		
		SFPM 172 (X)	6	BGYM 225 (H)	8		
				PHYM 221 (X)	8		
				PHYM 222 (X)	8		
Total 2 sem	24	Total 2nd sem	36	Total 2nd sem	60	Total 2nd se	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Total Year Level 1	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

15. Curriculum: Extended (Biochemistry - Chemistry) 200 201 N301M

Year 1		Year 2		Year 3		Year 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
Code	Cr	Code	Cr	Code	Cr	Code	Cr
SFBM 171 (H)	6	SFBM 172 (H)	6	MKBS 211 (X)	8	BCHS 314 (H)	16
SFCM171 (H)	6	SFCM 172 (H)	6	MKBS 212 (X)	8	BCHS 315 (H)	16
SFMM171 (X)	6	SFMM 172 (X)	6	MCHE 215 (H)	8	MCHE 315 (H)	16
SFPM 171 (X)	6	SFPM 172 (X)	6	MCHE 216 (H)	8	MCHE 316 (H)	16
AGLE 111 (X)	12			BCHS 211 (H)	8		
				BCHS 212 (H)	8		
				WVNS 211 (X)	12		
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFBM 171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	MCHE 322 (H)	16
SFCM171 (H)	6	SFBM 172 (H)	6	MCHE 221 (H)	8	MCHE 321 (H)	16
SFMM171 (X)	6	SFCM 172 (H)	6	MCHE 223 (H)	8	BCHS 324 (H)	16
SFPM 171 (X)	6	SFMM 172 (X)	6	MKBS 222 (X)	8	BCHS325 (H)	16
		SFPM 172 (X)	6	MKBS 223 (X)	8		
				BCHS 221 (H)	8		
				BCHS 222 (H)	8		
Total 2 sem	24	Total 2nd sem	36	Total 2nd sem	60	Total 2 sem	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Total Year Level 1	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

16. BSc Extended (Microbiology - Chemistry) 200-204 N301M

Year 1		Year 2		Year 3		Year 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
Code	Cr	Code	Cr	Code	Cr	Code	Cr
SFBM 171 (H)	6	SFBM 172 (H)	6	MKBS 211 (H)	8	MKBS 316 (H)	16
SFCM171 (H)	6	SFCM 172 (H)	6	MKBS 212 (H)	8	MKBS 317 (H)	16
SFMM171 (X)	6	SFMM 172 (X)	6	MCHE 215 (H)	8	MCHE 315 (H)	16
SFPM 171 (X)	6	SFPM 172 (X)	6	MCHE 216 (H)	8	MCHE 316 (H)	16
AGLE 111 (X)	12			BCHS 211 (X)	8		
				BCHS 212 (X)	8		
				WVNS 211 (X)	12		
SEM 1 Total	36	SEM 1 TOTAL	24	SEM 1 TOTAL	60	SEM 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFBM 171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	MCHE 322 (H)	16
SFCM171 (H)	6	SFBM 172 (H)	6	MCHE 221 (H)	8	MCHE 321 (H)	16
SFMM171 (X)	6	SFCM 172 (H)	6	MCHE 223 (H)	8	MKBS 326 (H)	16
SFPM 171 (X)	6	SFMM 172 (X)	6	MKBS 222 (H)	8	MKBS 327 (H)	16
		SFPM 172 (X)	6	MKBS 223 (H)	8		
				BCHS 221 (X)	8		
				BCHS 222 (X)	8		
Sem 2 Total	24	Total 2nd sem	36	Total 2nd sem	60	Total 2 sem	64
YEAR 1 TOTAL	60	YEAR 2 TOTAL	60	YEAR 3 TOTAL	120	Total year level 1	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

17. BSc Extended (Microbiology - Biochemistry) 200-202 N301M

Year 1		Year 2		Year 3		Year 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
Code	Cr	Code	Cr	Code	Cr	Code	Cr
SFBM 171 (H)	6	SFBM 172 (H)	6	MKBS 211 (H)	8	MKBS 316 (H)	16
SFCM171 (H)	6	SFCM 172 (H)	6	MKBS 212 (H)	8	MKBS 317 (H)	16
SFMM171 (X)	6	SFMM 172 (X)	6	BCHS 211 (H)	8	BCHS 314 (H)	16
SFPM 171 (X)	6	SFPM 172 (X)	6	BCHS 212 (H)	8	BCHS 315 (H)	16
AGLE 111 (X)	12			MCHE 215 (X)	8		
				MCHE 216 (X)	8		
				WVNS 211 (X)	12		
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFBM 171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	MKBS 326 (H)	16
SFCM171 (H)	6	SFBM 172 (H)	6	MCHE 221 (X)	8	MKBS 327 (H)	16
SFMM171 (X)	6	SFCM 172 (H)	6	MCHE 223 (X)	8	BCHS 324 (H)	16
SFPM 171 (X)	6	SFMM 172 (X)	6	MKBS 222 (H)	8	BCHS325 (H)	16
		SFPM 172 (X)	6	MKBS 223 (H)	8		
				BCHS 221 (H)	8		
				BCHS 222 (H)	8		
Sem 2 Total	24	Total 2nd Sem	36	Total 2nd Sem	60	Total 2nd Se	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Total Year Level 1	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

18. BSc Extended (Biology - Geography) 200 205 N301M

Year 1		Year 2		Year 3		Year 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
Code	Cr	Code	Cr	Code	Cr	Code	Cr
SFBM 171 (H)	6	SFBM 172 (H)	6	BGYM 215 (H)	8	BGYM 315 (H)	16
SFIM 171 (X)	6	SFIM 172 (X)	6	BGYM 216 (H)	8	BGYM 316 (H)	16
SFMM171 (X)	6	SFMM 172 (X)	6	GEOM 214(H)	8	GEOM 316(H)	16
SFGM171 (H)	6	SFGM 172 (H)	6	GEOM 215(H)	8	GEOM 317(H)	16
AGLE 111 (X)	12			CISM 213 (X)	8		
				CISM 214 (X)	8		
				WVNS 211 (X)	12		
Sem 1 Total	36	Sem 1 Total	24	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFBM 171 (H)	6	AGLE 121 (X)	12	WVNS 221 (X)	12	GEOM 328(H)	16
SFIM 171 (X)	6	SFBM 172 (H)	6	BGYM 226 (H)	16	GEOM 329(H)	16
SFMM171 (X)	6	SFIM 172 (X)	6	GEOM 224(H)	8	BGYM 326(H)	32
SFGM 171(H)	6	SFMM 172 (X)	6	GEOM 225(H)	8		
		SFGM 172 (H)	6	CISM 225 (X)	8		
				CISM 226 (X)	8		
Sem 2 Total	24	Total 2nd Semester	36	Total 2nd Semester	60	Total 2nd Semester	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Total Year Level 1	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

19. BSc Extended (Chemistry-Geography) 200 203 N301M

Year 1		Year 2		Year 3		Year 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMESTER 1	
Code	Cr	Code	Cr	Code	Cr	Code	Cr
SFGM 171(H)	6	SFGM 172(H)	6	GEOM 214(H)	8	GEOM 316(H)	16
SFCM 171(H)	6	SFCM 172(H)	6	GEOM 215(H)	8	GEOM 317(H)	16
SFMM 171(X)	6	SFMM 172(X)	6	MCHE 215(H)	8	MCHE 315(H)	16
SFPM 171(X)	6	SFPM 172(X)	6	MCHE 216(H)	8	MCHE 316(H)	16
AGLE 111(X)	12			Either PHYM 215 (X)	8		
				And PHYM 216 (X)	8		
				OrMAYM 217(X)	16		
				WVNS 211(X)	12		
SEM 1 Total	36	SEM 1 Total	24	SEM 1 Total	60	SEM 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFGM 171(H)	6	AGLE 121 (X)	12	WVNS 222	12	MCHE 322(H)	16
SFCM 171(H)	6	SFGM 172(H)	6	MCHE 221(H)	8	MCHE 321(H)	16
SFMM 171(X)	6	SFCM 172(H)	6	MCHE 223(H)	8	GEOM 328(H)	16
SFPM 171(X)	6	SFMM 172(X)	6	GEOM 224(H)	8	GEOM 329(H)	16
		SFPM 172(X)	6	GEOM 225(H)	8		
				Either PHYM 221 (X)	8		
				And PHYM 222 (X)	8		
				OrMAYM227 (X)	16		
SEM 2 Total	24	Total 2 sem	36	Total 2 sem	60	Total 2 sem	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

20. Curriculum: Extended (Computer Science -Geography) 200 206 N301M

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
SEMESTER 1		SEMESTER 1		SEMESTER 1		SEMETER 1	
Code	Cr	Code	Cr	Code	Cr	Code	Cr
SFGM 171(H)	6	SFGM 172(H)	6	WVNS 211(X)	12	CISM 313 (H)	16
SFMM171(X)	6	SFMM172(X)	6	CISM 213 (H)	8	CISM 314 (H)	16
SFIM 171(H)	6	SFIM 172(H)	6	CISM 214 (H)	8	GEOM 316(H)	16
STFM 111(X)	12			MAYM 217(X)	16	GEOM 317(H)	16
AGLE 111(X)	12			GEOM 214(H)	8		
				GEOM 215(H)	8		
Sem 1 Total	42	Sem 1 Total	18	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2		SEMESTER 2	
SFGM 171(H)	6	AGLE 121 (X)	12	WVNS 221(X)	12	CISM 326 (H)	16
SFMM171(X)	6	STFM 121(X)	12	CISM 225 (H)	8	CISM 327 (H)	16
SFIM 171(H)	6	SFMM172(X)	6	CISM 226 (H)	8	GEOM 328(H)	16
		SFGM 172(H)	6	MAYM 227(X)	16	GEOM 329(H)	16
		SFIM 172 (H)	6	GEOM 224(H)	8		
				GEOM 225(H)	8		
Sem 2 Total	18	Sem 2 Total	42	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	60	Year 2 Total	60	Year 3 Total	120	Year 4 Total	128
CURRICULUM TOTAL 368							

*Core modules are indicated with (H) and ancillary modules with (X)

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

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	APMM 317 (H)	16
APMM 117 (H)	12	APMM 217 (H)	16	APMM 318 (H)	16
MAYM 117 (X)	12	MAYM 217 (X)	16	ELYM 315 (H)	16
ELYM 115 (H)	12	ELYM 215 (H)	16	ELYM 316 (H)	16
CISM 112 (X)	12				
Total 1st sem	60	Total 1st sem	60	Total 1st Sem	64
Second semester		Second Semester		Second semester	
AGLE 121 (X)	12	WVNS 221 (X)	12	APMM 327 (H)	16
APMM 127 (H)	12	APMM 227 (H)	16	APMM 328 (H)	16
MAYM 127 (X)	12	MAYM 227 (X)	16	ELYM 327 (H)	16
ELYM 127 (H)	12	ELYM 227 (H)	16	ELYM 328 (H)	16
CISM 124 (X)	12				
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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	APMM 317 (H)	16
APMM 117 (H)	12	APMM 217 (H)	16	APMM 318 (H)	16
PHYM 118 (X)	12	PHYM 215 (X)	8	MAYM 317 (H)	16
MAYM 117 (H)	12	PHYM 216 (X)	8	MAYM 318 (H)	16
CISM 112 (X)	12	MAYM 217 (H)	16		
Total 1st sem	60	Total 1st sem	60	Total 1st Sem	64
Second semester		Second Semester		Second semester	
AGLE 121 (X)	12	WVNS 221 (X)	12	APMM 327 (H)	16
APMM 127 (H)	12	APMM 227 (H)	16	APMM 328 (H)	16
PHYM 128 (X)	12	PHYM 221 (X)	8	MAYM 327 (H)	16
MAYM 127 (H)	12	PHYM 222 (X)	8	MAYM 328 (H)	16
CISM 124 (X)	12	MAYM 227 (H)	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	128
Total credits for the curriculum 368					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	APMM 317 (H)	16
APMM 117 (H)	12	APMM 217 (H)	16	APMM 318 (H)	16
PHYM 118 (H)	12	PHYM 215 (H)	8	PHYM 315 (H)	8
MAYM 117 (X)	12	PHYM 216 (H)	8	PHYM 316 (H)	8
CISM 112 (X)	12	MAYM 217 (X)	16	PHYM 317 (H)	8
				PHYM 318 (H)	8
Total 1st sem	60	Total 1st sem	60	Total 1st sem	64
Second semester		Second Semester		Second semester	
AGLE 121 (X)	12	WVNS 221 (X)	12	APMM 327 (H)	16
APMM 127 (H)	12	APMM 227 (H)	16	APMM 328 (H)	16
PHYM 128 (H)	12	PHYM 221 (H)	8	PHYM 321 (H)	8
MAYM 127 (X)	12	PHYM 222 (H)	8	PHYM 322 (H)	8
CISM 124 (X)	12	MAYM 227 (X)	16	PHYM 323 (H)	8
				PHYM 324 (H)	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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	BCHS 314 (H)	16
BGYM 113 (H)	12	MKBS 211 (X)	8	BCHS 315 (H)	16
MAYM 116 (X)	12	MKBS 212 (X)	8	MCHE 315 (H)	16
MCHE 114 (H)	12	MCHE 215 (H)	8	MCHE 316 (H)	16
PHYM 118 (X)	12	MCHE 216 (H)	8		
		BCHS 211 (H)	8		
		BCHS 212 (H)	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 (H)	12	WVNS 221 (X)	12	BCHS 324 (H)	16
PHYM 128 (X)	12	MKBS 223 (X)	8	BCHS 325 (H)	16
MAYM 126 (X)	12	MKBS 222 (X)	8	MCHE 321 (H)	16
AGLE 121 (X)	12	MCHE 221 (H)	8	MCHE 322 (H)	16
MCHE 121 (H)	12	MCHE 223 (H)	8		
		BCHS 221 (H)	8		
		BCHS 222 (H)	8		
Total 2nd sem	60	Total 2nd sem	60	Total 2nd semester	64
Total credits for the curriculum: 368					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	MKBS 316 (H)	16
BGYM 113 (H)	12	MKBS 211 (H)	8	MKBS 317 (H)	16
MAYM 116 (X)	12	MKBS 212 (H)	8	BCHS 314 (H)	16
		BCHS 211 (H)	8	BCHS 315 (H)	16
MCHE 114 (H)	12	BCHS 212 (H)	8		
PHYM 118 (X)	12	MCHE 215 (X)	8		
		MCHE 216 (X)	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 (H)	12	WVNS 221 (X)	12	MKBS 326 (H)	16
MCHE 121 (H)	12	MKBS 223 (H)	8	MKBS 327 (H)	16
PHYM 128 (X)	12	MKBS 222 (H)	8	BCHS 324 (H)	16
MAYM 126 (X)	12	BCHS 221 (H)	8	BCHS 325 (H)	16
AGLE 121 (X)	12	BCHS 222 (H)	8		
		MCHE 221 (X)	8		
		MCHE 223 (X)	8		
Total 2nd sem	60	Total 2nd sem	60	Total 2nd sem	64
Total credits for the curriculum: 368					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	MKBS 316 (H)	16
BGYM 113 (H)	12	MKBS 211 (H)	8	MKBS 317 (H)	16
MAYM 116 (X)	12	MKBS 212 (H)	8	MCHE 315 (H)	16
MCHE 114 (H)	12	MCHE 215 (H)	8	MCHE 316 (H)	16
PHYM 118 (X)	12	MCHE 216 (H)	8		
		BCHS 211 (X)	8		
		BCHS 212 (X)	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 (X)	12	WVNS 221 (X)	12	MKBS 326 (H)	16
BGYM123 (H)	12	MKBS 223 (H)	8	MKBS 327 (H)	16
MAYM 126 (X)	12	MKBS 222 (H)	8	MCHE 322 (H)	16
MCHE 121 (H)	12	MCHE 221 (H)	8	MCHE 321 (H)	16
PHYM 128 (X)	12	MCHE223 (H)	8		
		BCHS 221 (X)	8		
		BCHS 222 (X)	8		
Total 2nd sem	60	Total 2nd sem	60	Total 2nd sem	64
Total Credits: 368					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	BGYM 313 (H)	16
BGYM 113 (H)	12	BGYM 213 (H)	8	BGYM 314 (H)	16
MAYM 116 (X)	12	BGYM 214 (H)	8	MCHE 315 (H)	16
MCHE 114 (H)	12	MCHE 215 (H)	8	MCHE 316 (H)	16
PHYM 118 (X)	12	MCHE 216 (H)	8		
		PHYM 215 (X)	8		
		PHYM 216 (X)	8		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
BGYM 123 (H)	12	WVNS 221 (X)	12	BGYM 326 (H)	32
MCHE 121 (H)	12	BGYM 227 (H)	8	MCHE 321 (H)	16
PHYM 128 (X)	12	BGYM 225 (H)	8	MCHE 322 (H)	16
MAYM 126 (X)	12	PHYM 221 (H)	8		
ALGE 121 (X)	12	PHYM 222 (H)	8		
		MCHE 221 (X)	8		
		MCHE 223 (X)	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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	BGYM 316 (H)	16
CISM 112 (X)	12	BGYM 215 (H)	8	BGYM 315 (H)	16
MAYM 116 (X)	12	BGYM 216 (H)	8	GEOM 316 (H)	16
GEOM 113 (H)	12	GEOM 214 (H)	8	GEOM 317 (H)	16
BGYM 113 (H)	12	GEOM 215 (H)	8		
		CISM 213 (X)	8		
		CISM 214 (X)	8		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121 (X)	12	WVNS 222 (X)	12	BGYM 326 (H)	32
CISM 122 (X)	12	BGYM 226 (H)	16	GEOM 328 (H)	16
MAYM 126 (X)	12	GEOM 224 (H)	8	GEOM 329 (H)	16
BGYM 123 (H)	12	GEOM 225 (H)	8		
GEOM 123 (H)	12	CISM 225 (X)	8		
		CISM 226 (X)	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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	MCHE 315 (H)	16
CISM 112 (H)	12	CISM 213 (H)	8	MCHE 316 (H)	16
MAYM 117 (X)	12	CISM 214 (H)	8	CISM 313 (H)	16
MCHE 114 (H)	12	MAYM 217 (X)	16	CISM 314 (H)	16
PHYM 118 (X)	12	MCHE 215 (H)	8		
		MCHE 216 (H)	8		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121 (X)	12	WVNS 221 (X)	12	MCHE 321 (H)	16
CISM 122 (H)	12	CISM 225 (H)	8	MCHE 322(H)	16
MAYM 127 (X)	12	CISM 226 (H)	8	CISM 326 (H)	16
MCHE 121 (H)	12	MAYM 227 (X)	16	CISM 327 (H)	16
PHYM 128 (X)	12	MCHE 221 (H)	8		
		MCHE 223 (H)	8		
Total 2nd sem	60	Total 2nd sem	69	Total 2nd sem	64
Total year level 1	120	Total year level 2	120	Total year level	128
Total credits for the curriculum 368					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (H)	12	WVNS 211 (X)	12	GEOM 316 (H)	16
MCHE 114 (H)	12	GEOM 214 (H)	8	GEOM 317 (H)	16
MAYM 117 (X)	12	GEOM 215 (H)	8	MCHE 315 (H)	16
PHYM 118 (X)	12	MCHE 215 (H)	8	MCHE 316 (H)	16
AGLE 111 (X)	12	MCHE 216 (H)	8		
		EITHER PHYM 215 (X)	8		
		AND PHYM 216 (X)	8		
		OR MAYM 217 (X)	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 (H)	12	GEOM 224 (H)	8	GEOM 328 (H)	16
MCHE 121 (H)	12	GEOM 225 (H)	8	GEOM 329 (H)	16
MAYM 127 (X)	12	MCHE 221 (H)	8	MCHE 321 (H)	16
PHYM 128 (X)	12	MCHE 223 (H)	8	MCHE 322 (H)	16
AGLE 121 (X)	12	EITHER PHYM 221 (X)	8		
		AND PHYM 222 (X)	8		
		OR MAYM 227 (X)	16		
		WVNS 222 (X)	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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	MAYM 317 (H)	16
MCHE 114 (H)	12	MCHE 215 (H)	8	MAYM 318 (H)	16
PHYM 118 (X)	12	MCHE 216 (H)	8	MCHE 315 (H)	16
MAYM 117 (H)	12	MAYM 217 (H)	16	MCHE 316 (H)	16
CISM 112 (X)	12	PHYM 215 (X)	8		
		PHYM 216 (X)	8		
Total 1st sem	60	Total 1st sem	60	Total 1st sem	64
Second semester		Second Semester		Second semester	
AGLE 121 (X)	12	WVNS 221 (X)	12	MAYM 327 (H)	16
MCHE 121 (H)	12	MCHE 221 (H)	8	MAYM 328 (H)	16
PHYM 128 (X)	12	MCHE 223 (H)	8	MCHE 321 (H)	16
MAYM 127 (H)	12	MAYM 227 (H)	16	MCHE 322 (H)	16
CISM 124 (X)	12	PHYM 221 (X)	8		
		PHYM 222 (X)	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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	PHYM 315 (H)	8
MCHE 114 (H)	12	MCHE 215 (H)	8	PHYM 316 (H)	8
PHYM 118 (H)	12	MCHE 216 (H)	8	PHYM 317 (H)	8
MAYM 117 (X)	12	MAYM 217(X)	16	PHYM 318 (H)	8
CISM 112 (X)	12	PHYM 215 (H)	8	MCHE 315 (H)	16
		PHYM 216 (H)	8	MCHE 316 (H)	16
Total 1st sem	60	Total 1st sem	60	Total 1st sem	64
Second semester		Second Semester		Second semester	
AGLE 121 (X)	12	WVNS 221 (X)	12	PHYM 321 (H)	8
MCHE 121 (H)	12	MCHE 221 (H)	8	PHYM 322 (H)	8
PHYM 128 (H)	12	MCHE 223 (X)	8	PHYM 323 (H)	8
MAYM 127 (X)	12	MAYM 227 (H)	16	PHYM 324 (H)	8
CISM 124 (X)	12	PHYM 221 (H)	8	MCHE 321 (H)	16
		PHYM 222 (H)	8	MCHE 322 (H)	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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	CISM 313 (H)	16
CISM 112 (H)	12	CISM 213 (H)	8	CISM 314 (H)	16
ELYM 115 (H)	12	CISM 214 (H)	8	ELYM 315 (H)	16
MAYM 117 (X)	12	ELYM 215 (H)	16	ELYM 316 (H)	16
PHYM 118 (X)	12	MAYM217 (X)	16		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121 (X)	12	WVNS 221 (X)	12	CISM 326 (H)	16
CISM 122 (H)	12	CISM 225 (H)	8	CISM 327 (H)	16
		CISM 226 (H)	8	CISM 327 (H)	16
ELYM 127 (H)	12	ELYM 227 (H)	16	ELYM 328 (H)	16
MAYM 127 (X)	12	MAYM 227 (X)	16		
PHYM 128 (X)	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	120
Total credits for the curriculum 368					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (H)	12	GEOM 214 (H)	8	GEOM 316 (H)	16
CISM 112 (H)	12	GEOM 215 (H)	8	GEOM 317 (H)	16
MAYM 117 (X)	12	CISM 213 (H)	8	CISM 313 (H)	16
STFM 111 (X)	12	CISM 214 (H)	8	CISM 314 (H)	16
AGLE 111 (X)	12	MAYM 217 (X)	16		
		WVNS 211 (X)	12		
Sem 1 Total	60	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
GEOM 123 (H)	12	GEOM 224 (H)	8	GEOM 328 (H)	16
CISM 124 (H)	12	GEOM 225 (H)	8	GEOM 329 (H)	16
MAYM 127 (X)	12	CISM 225 (H)	8	CISM 326 (H)	16
STFM 121 (X)	12	CISM 226 (H)	8	CISM 327 (H)	16
AGLE 121 (X)	12	MAYM 227 (X)	16		
		WVNS 222 (X)	12		
Sem 2 Total	60	Sem 2 Total	60	Sem 2 Total	64
Year 1 Total	120	Year 2 Total	120	Year 3 Total	128
CURRICULUM TOTAL 368					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	CISM 313 (H)	16
CISM 112 (H)	12	CISM 213 (H)	8	CISM 314 (H)	16
PHYM 118 (X)	12	CISM 214 (H)	8	MAYM 317 (H)	16
MAYM 117 (H)	12	MAYM 217 (H)	16	MAYM 318 (H)	16
APMM 117 (X)	12	APMM 217 (X)	16		
Sem 1 Total	60	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121 (X)	12	WVNS 221 (X)	12	CISM 326 (H)	16
CISM 122 (H)	12	CISM 225 (H)	8	CISM 327 (H)	16
		CISM 226 (H)	8	MAYM 327 (H)	16
MAYM 127 (H)	12	MAYM 227 (H)	16	MAYM 328 (H)	16
APMM 127 (X)	12	APMM 227 (X)	16		
PHYM 128 (X)	12				
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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	CISM 313 (H)	16
CISM 112 (H)	12	CISM 213 (H)	8	CISM 314 (H)	16
PHYM 118 (H)	12	CISM 214 (H)	8	PHYM 315 (H)	8
MAYM 117 (X)	12	PHYM 215 (H)	8	PHYM 316 (H)	8
MCHE 114 (X)	12	PHYM 216 (H)	8	PHYM 317 (H)	8
		MAYM 217 (X)	16	PHYM 318 (H)	8
Sem 1 Total	60	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121 (X)	12	WVNS 221 (X)	12	CISM 326 (H)	16
CISM 122 (H)	12	CISM 225 (H)	8	CISM 327 (H)	16
		CISM 226 (H)	8	PHYM 321 (H)	8
PHYM 128 (H)	12	PHYM 221 (H)	8	PHYM 322 (H)	8
MAYM 127 (X)	12	PHYM 222 (H)	8	PHYM 323 (H)	8
MCHE 121 (X)	12	MAYM 227 (X)	16	PHYM 324 (H)	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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	MAYM 317 (H)	16
ELYM 115 (H)	12	ELYM 215 (H)	16	MAYM 318 (H)	16
APMM 117 (X)	12	APMM 217 (X)	16	ELYM 315 (H)	16
MAYM 117 (H)	12	MAYM 217 (H)	16	ELYM 316 (H)	16
CISM 112 (X)	12				
Total 1st sem	60	Total 1st sem	60	Total 1st Sem	64
Second semester		Second Semester		Second semester	
AGLE 121 (X)	12	WVNS 221 (X)	12	MAYM 327 (H)	16
ELYM 127 (H)	12	ELYM 227 (H)	16	MAYM 328 (H)	16
APMM 127 (X)	12	APMM 227 (X)	16	ELYM 327 (H)	16
MAYM 127 (H)	12	MAYM 227 (H)	16	ELYM 328 (H)	16
CISM 124 (X)	12				
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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	PHYM 315 (H)	8
ELYM 115 (H)	12	ELYM 215 (H)	16	PHYM 316 (H)	8
PHYM 118 (H)	12	PHYM 215 (H)	8	PHYM 317 (H)	8
MAYM 117 (X)	12	PHYM 216 (H)	8	PHYM 318 (H)	8
CISM 112 (X)	12	MAYM 217 (X)	16	ELYM 315 (H)	16
				ELYM 316 (H)	16
Sem 1 Total	60	Sem 1 Total	60	Sem 1 Total	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121 (X)	12	WVNS 221 (X)	12	PHYM 321 (H)	8
ELYM 127 (H)	12	ELYM 227 (H)	16	PHYM 322 (H)	8
PHYM 128 (H)	12	PHYM 221 (H)	8	PHYM 323 (H)	8
MAYM 127 (X)	12	PHYM 222 (H)	8	PHYM 324 (H)	8
CISM 124 (X)	12	MAYM 227 (X)	16	ELYM 327 (H)	16
				ELYM 328 (H)	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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	MAYM 317 (H)	16
ELYM 115 (X)	12	ELYM 215 (X)	16	MAYM 318 (H)	16
PHYM 118 (H)	12	PHYM 215 (H)	8	PHYM 315 (H)	8
MAYM 117 (H)	12	PHYM 216 (H)	8	PHYM 316 (H)	8
CISM 112 (X)	12	MAYM 217 (H)	16	PHYM 317 (H)	8
				PHYM 318 (H)	8
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121 (X)	12	WVNS 221 (X)	12	MAYM 327 (H)	16
ELYM 127 (X)	12	ELYM 227 (X)	16	MAYM 328 (H)	16
PHYM 128 (H)	12	PHYM 221 (H)	8	PHYM 321 (H)	8
MAYM 127 (H)	12	PHYM 222 (H)	8	PHYM 322 (H)	8
CISM 124 (X)	12	MAYM 227 (H)	16	PHYM 323 (H)	8
				PHYM 324 (H)	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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 (X)	12	WVNS 211 (X)	12	MAYM 317 (H)	16
MAYM 117 (H)	12	MAYM 217 (H)	16	MAYM 318 (H)	16
STFM 111 (H)	12	STFM 211 (H)	8	STFM 311 (H)	16
APMM 117 (X)	12	STFM 212 (H)	8	STFM 312 (H)	16
CISM 112 (X)	12	APMM 217 (X)	16		
Total 1st semester	60	Total 1st semester	60	Total 1st Semester	64
Second semester		Second Semester		Second semester	
AGLE 121 (X)	12	WVNS 221 (X)	12	MAYM 327 (H)	16
MAYM 127 (H)	12	MAYM 227 (H)	16	MAYM 328 (H)	16
STFM 121 (H)	12	STFM 221 (H)	8	STFM 321 (H)	16
APMM 127 (X)	12	STFM 222 (H)	8	STFM 322 (H)	16
CISM 124 (X)	12	APMM 227 (X)	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					

*Core modules are indicated with (H) and ancillary modules with (X)

22. Curriculum: BSc Botany - Zoology N 164 MM – 200 118

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 (X)	12	WVNS 211 (X)	12	PLKS 311 (H)	32
CISM 112 (X)	12	PLKN 212 (H)	16	DRKS 311 (H)	32
MAYM 116 (X)	12	ZOOM 211 (H)	16		
BGYM 113 (H)	12	MCHE 215 and	8		
MCHE 114 (X)	12	MCHE 216 (H) OR	8		
		BCHS 211 and	8		
		BCHS 212 (H) OR	8		
		MKBS 211 and	8		
		MKBS 212 (H)	8		
			8		
SEM 1 TOTAL	60	SEM 1 TOTAL	60	SEM 1 TOTAL	64
SEMESTER 2		SEMESTER 2		SEMESTER 2	
AGLE 121 (X)	12	WVNS 222 (X)	12	BOTM 321 (H)	32
CISM 124 (X)	12	PLKS 221(H)	16	ZOOM 321(H)	32
MAYM 126 (X)	12	DRKS 221 (H)	16		
BGYM 123 (H)	12	MCHE 221 and	8		
MCHE 121 (X)	12	MCHE 223 (H) OR	8		
		BCHS 221 amd	8		
		BCHS 222 (H)	8		
		OR	8		
		MKBS 222 and	8		
		MKBS 223 (H)	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					

*Core modules are indicated with (H) and ancillary modules with (X)

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 be able to identify and differentiate normal tissues and anatomical organs in domestic animals.		
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, differentiate the anatomy and physiology of domestic animals including birds with respect to the respiratory, circulatory, gastrointestinal, urinary, and reproductive systems. In practical sessions be able to identify and differentiate normal tissues and anatomical organs in domestic animals.		
CODE AHVM112	CREDITS 8	SEMESTER 1
Title: Animal welfare, 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 welfare, 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/ 226	CREDITS 12	SEMESTER 2
Title: Basic Microbiology 1 for Animal Health		

Module outcomes:		
<p>Students should be able to give a basic description of the classes of microorganisms of veterinary importance (bacteria, viruses, fungi, rickettsia and protozoans etc).</p> <p>Give a general grouping of bacteria and fungi of veterinary importance according to staining results, morphology and characteristics.</p> <p>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.</p> <p>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.</p>		
CODE AHVM226	CREDITS 12	SEMESTER 2
Title: Basic Microbiology II for Animal Health		
Module outcomes:		
<p>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).</p> <p>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.</p>		
CODE AHVM211	CREDITS 12	SEMESTER 1
Title: Diseases I		
Module outcomes:		
<p>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.</p> <p>In practical sessions students will be involved in assisting the veterinarian in the examination, diagnosis and treatment as well as prevention of the diseases..</p> <p>When specific disease conditions are not seen in the live animals, videos will be used to supplement the student practical learning.</p> <p>Students will be guided in the use of epidemiological surveys and investigations including the collection and recording of data related to the diseases studied.</p>		
CODE AHVM221	CREDITS 12	SEMESTER 2
Title: Diseases II		

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 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 4

Title: Public Health for Animal Health I

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.

NEW CODE AHVM316

CREDITS 8

SEMESTER 5

Title: Public Health for Animal Health II

At completion of this module the students should be able to:

- demonstrate detailed knowledge of requirements and legislation in prevention and control of meat borne diseases and hygiene principles in an abattoir;
- demonstrate detailed knowledge and understanding of micro-organisms in meat and the meat environment to be able to control abattoir hygiene, meat safety standards and waste management, perform veterinary procedures of ante mortem of slaughtered animals and primary meat inspections of different species' carcasses and identify and deal with factors influencing meat quality; and
- demonstrate the ability to act in accordance with prescribed organisational and professional ethical codes of conduct regarding the abattoir environment.

OLD CODES AHAD 372, AHDM323 NEW CODE AHVM225	CREDITS 8	SEMESTER 2
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Title: **Clinical Laboratory Techniques**

Module outcomes:

Students should be able to explain the basic laboratory techniques.
 Demonstrate the basic theoretical and practical laboratory diagnostic 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.
 Demonstrate the knowledge and application of basic laboratory practices

OLD CODES AHAD 302, AHAM411 NEW CODE AHVM311/ AHVM 316	CREDITS 16	SEMESTER 1
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Title: **Companion Animal Clinical Care for AHT 1**

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.
 Ability to assist veterinarians in surgery, diagnostics, and treatments.
 In practical sessions be able to conduct procedures such as: 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 debilitated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination.
 Be able to execute 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, AHAM 421 NEW CODE AHVM 321/326	CREDITS 12	SEMESTER 2
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Title: **Companion Animal Clinical Care for AHT 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.

Be able to execute procedures done during practical sessions such as: 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 debilitated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination.

Be able to execute 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 332, AHDM314 AHVM312	CREDITS 16	SEMESTER 1
NEW CODE AHVM 317		

Title: **Production Animal Clinical Care for AHT 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.

Be able to conduct procedures such as: 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 debilitated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination.

Be able to execute 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; AHVM 326	CREDITS 16	SEMESTER 2
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Title: **Production Animal Clinical Care for AHT II**

Module outcomes:

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 be able to conduct procedures such as: 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 debilitated 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 322, AHDM313 NEW CODE AHVM313	CREDITS 8	SEMESTER 1
Title: Pathology I		
Module outcomes: Students should be able to explain the common concepts of general pathology. Students should be able to perform post mortem procedures and write the report using correct terminology. Be able to collect collect and dispatch specimens, in addition to proper disposal and disinfection of carcasses and pollution sites respectively. Understand the general pathology of the cells, blood circulation, inflammation and causes of diseases		
CODE AHVM323	CREDITS 8	SEMESTER 2
Title: Pathology II		
Module outcomes: Shoud be able to conduct postmortems and write reports using correct terminology Be able to collect collect and dispatch specimens for laboratory diagnosis Able to describe the systemic pathology of the skin, muscular skeletal system, CVS, RS, GIT, haemopoietic, urinary, reproductive, nervous and endocrine systems.		
Old CODE AHVM 314 New code AHVM 318	CREDITS 8	SEMESTER 1
Title: Epidemiology		
Module outcomes: 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. Be able to understand the 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 and the use of epidemiological surveys and investigations. Vaccination programmes. Practicals apply knowlegde acquired above under field conditions		

OLD CODES AHD 342, AHDM315; AHVM315; NEW CODE AHVM 319	CREDITS 12	SEMESTER 1
Title: Practical Experiential Learning I		
<p>Module outcomes:</p> <p>In addition to the experience acquired during clinics and outreach sessions, 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 would have spent at least 2 weeks in the field (outside the University) in an approved laboratory, registered veterinary clinic, state veterinary office, wildlife park, breeding stations, poultry houses, auctions and other such stations under the supervision of qualified veterinarians, game rangers or game veterinarian. Students would have worked at the University farm under the supervision of the farm sectional managers, the farm manager and animal health staff members at prescribed times.</p>		
CODE AHVM 325 OLD AHVM 328	CREDITS 12	SEMESTER 2
Title: Practical Experiential Learning II		
<p>Module outcomes:</p> <p>In addition to the experience acquired during clinics and outreach sessions, 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.</p> <p>students would have spent time at the land, sea and air borders around the country to study and apply knowledge on the control of export and import of animals and food of animal origin</p> <p>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.</p>		
CODE AHVM324	CREDITS 8	SEMESTER 2
Title: Scheduled Diseases		
<p>Modules outcomes:</p> <p>Students should be able to describe and perform procedures relating to controlled diseases such as : Tuberculosis (TB) and Contagious Abortion (CA), FMD, eradication schemes as prescribed by the National Department of Agriculture.</p> <p>Describe the general concepts of Scheduled Diseases and current disease outbreaks.</p> <p>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.</p>		

CODE AHVM326	CREDITS 8	SEMESTER 2
Veterinary Jurisprudence		
At completion of this module students should be able to: demonstrate knowledge and understanding of important legislation governing the veterinary and para-veterinary laws in the world and in South Africa; demonstrate knowledge of the application of legislation in the control of diseases and the role of animal health technicians; demonstrate the ability to formulate and write legal documents; understand the concept of animal welfare and animal welfare assessment of both farm animals and companion animals; and understand procedures and legislation and solve problems when dealing with trading, animal protection and insurance.		

MA.2.2 BSC AGRIC - ANIMAL HEALTH

OLD CODES AHAM211, AHPM211 NEW CODE AHPM213	AHA 222,	CREDITS 13	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. Ability to apply the above acquired knowledge to conduct research			
OLD CODES AHAM112 AHPM212 NEW CODE AHPM215	AHA 132,	CREDITS 12	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 AHAM122 AHPM 221 NEW CODE AHPM 224	AHA 152,	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. Practical; Demonstrations by lecturer and dissections by students of systems, organs and tissues studied in the theory.

CODE AHPM 222	CREDITS 12	SEMESTER 2
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Title: **Animal welfare, 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 AHPM 215	CREDITS 12	SEMESTER 2
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Title: **Introduction to game and wildlife**

At completion of this module students should be able to:
 demonstrate detailed knowledge and understanding of the principles, habitat, game capture, physiology & chemistry; nutrition, disease, toxic plants & soil; vegetation, carrying capacity & game reserve management;
 demonstrate knowledge and understanding of clinical techniques, preventions and considerations used in game and wildlife care;
 identify, analyse and solve problems in the context of game and wild life care; and
 communicate and debate information and solutions to problems in this particular field of study.

CODE AHPM314	CREDITS 8	SEMESTER 1
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Title: **Animal welfare, 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
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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, samplig and diagnostic methods, treatment, and preventative measures with emphasis on the notifiable diseases. Evaluate lists of differential diagnosis an 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
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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, sampling and 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.

OLD CODE AHPM 312 New Code	CREDITS 8	SEMESTER 1
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Title: **Epidemiology**

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
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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, AHAM323 NEW CODE AHPM322	CREDITS 16	SEMESTER 2
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Title: **Parasitology: Animal Health**

Module outcomes:

Students should be able to describe the basic aspects of the commonly encountered internal and external parasites.
Describe the basic classes of the commonly encountered helminths (nematodes, trematodes, cestodes)
.Describe the basic classes of the commonly encountered ticks, mites, insects and lice of veterinary importances
Treatment and control for external parasites.
Treatment and control of helminths using both oral and injectable medication

Practicals: Identification of helminths, and/ or eggs from faecal samples,

Identification of external parasites; including ticks, tick counts, mites, insects and lice
Dipping for external parasites
Ability to apply the acquired knowledge to conduct research,

CODE AHPM323	CREDITS 16	SEMESTER 2
Title: Pharmacology and Toxicology: Animal Health		
Module outcomes:		
<p>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</p>		
OLD CODES AHA 202, AHAM213 AHPM324 NEW CODE AHPM 315	CREDITS 12	SEMESTER 2
Title: Public Health for Animal Health I		
Module outcomes:		
<p>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.</p>		
NEW CODE AHPM 328	CREDITS 12	SEMESTER 2
Title: Public Health for Animal Health II		
<p>At completion of this module students should be able to:</p> <ul style="list-style-type: none"> demonstrate knowledge of requirements and legislation in prevention and control of meat borne diseases and hygiene principles in an abattoir; demonstrate integrated knowledge and understanding of micro-organisms in meat and the meat environment to be able to control abattoir hygiene, meat safety standards and waste management, perform veterinary procedures of ante mortem of slaughtered animals and primary meat inspections of different species' carcasses and identify and deal with factors influencing meat quality; the ability to gather information regarding building requirements for abattoir facilities, evaluate and manage the information and communicate and debate the recommendations; and demonstrate the ability to act in accordance with prescribed organisational and professional ethical codes of conduct regarding the abattoir environment. 		
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
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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
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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
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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.

NEW CODE AHPM327	CREDITS 8	SEMESTER 2
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Veterinary Jurisprudence

At completion of this module students should be able to:

- demonstrate integrated knowledge and understanding of legislation governing the veterinary and para-veterinary laws in the world and in South Africa;
- demonstrate knowledge of the application of legislation in the control of diseases and the role of animal health technicians;
- demonstrate the ability to formulate and write legal documents;
- understand the concept of animal welfare and animal welfare assessment of both farm animals and companion animals; and
- apply knowledge of procedures and legislation to deal with trading, animal protection and insurance and critically reflect and communicate theory driven arguments.

OLD CODES AHA 432, AHAM414 NEW CODE AHPM412	CREDITS 16	SEMESTER 1
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Title: **Production Animal clinical care for AHT 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 AHPM 422	CREDITS 16	SEMESTER 2
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Title: **Production Animal clinical care for AHT 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
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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,

CREDITS 8

SEMESTER 1

AHAM415

NEW CODE AHPM414

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	NQF LEVEL 5	CREDITS 12
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	NQF LEVEL 5	CREDITS 8
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	NQF LEVEL 6	CREDITS 16
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	NQF LEVEL 6	CREDITS 8
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	NQF LEVEL 6	CREDITS 8
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	NQF LEVEL 6	CREDITS 16
Title: Smallstock Production and Management			
Module outcomes:			
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.			
Module code: ANDM 223	Semester 2	NQF LEVEL 6	CREDITS 16
Title: Beef Cattle Production and Management			
Module outcomes:			
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.			
Module code: ANDM 225	Semester 2	NQF LEVEL 6	CREDITS 16
Title: Principles of Veld Management			
Module outcomes:			
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.		
Module code: ANDM 312	Semester 1	NQF LEVEL 7 CREDITS 16
Title: Poultry Production and Management		
Module outcomes: 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.		
Module code: ANDM 313	Semester 1	NQF LEVEL 7 CREDITS 16
Title: Dairy Cattle Production and Management		
Module outcomes: 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.		
Module code: ANDM 314	Semester 1	NQF LEVEL 7 CREDITS 16
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	NQF LEVEL 7 CREDITS 56
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	NQF LEVEL 5 CREDITS 12
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	NQF LEVEL 6 CREDITS 12
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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	NQF LEVEL 6 CREDITS 8
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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	NQF LEVEL 6 CREDITS 8
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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	NQF LEVEL 6 CREDITS 16
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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	NQF LEVEL 6 CREDITS 8
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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	NQF LEVEL 7	CREDITS 16
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	NQF LEVEL 7	CREDITS 16
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	NQF LEVEL 7	CREDITS 8
Title: Agricultural Biochemistry			
Module outcomes: 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.			
Module code: ANSM 314	Semester 1	NQF LEVEL 7	CREDITS 16
Title: Physiology of Reproduction and Growth			
Module outcomes: 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			
Module code: ANSM 321	Semester 2	NQF LEVEL 7	CREDITS 16
Title: Applied Ruminant Nutrition			
Module outcomes: 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.			
Module code: ANSM 322	Semester 2	NQF LEVEL 7	CREDITS 8

Title: Planted Pastures and Fodder Crops			
Module outcomes: 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.			
Module code: ANSM 323	Semester 2	NQF LEVEL 7	CREDITS 16
Title: Quantitative Genetics			
Module outcomes: 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.			
Module code: ANSM 324	Semester 2	NQF LEVEL 7	CREDITS 16
Title: Smallstock Production and Science			
Module outcomes: 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 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	NQF LEVEL 8	CREDITS 16
Title: Applied Monogastric Nutrition			
Module code: ANSM 412	Semester 1	NQF LEVEL 8	CREDITS 16
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	NQF LEVEL 8	CREDITS 16
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	NQF LEVEL 8	CREDITS 8
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	NQF LEVEL 8 CREDITS 16
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	NQF LEVEL 8 CREDITS 8
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	NQF LEVEL 8 CREDITS 8
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	NQF LEVEL 8 CREDITS 16
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	NQF LEVEL 8 CREDITS 16
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 111	Semester 1	NQF LEVEL 5 CREDITS 12
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	NQF LEVEL 7 CREDITS 8
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	NQF LEVEL 5 CREDITS 12
Title: Introduction to Agricultural EconomicsI		
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	NQF LEVEL 6 CREDITS 8
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	NQF LEVEL 6 CR3EDITS 8
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	NQF LEVEL 7 CREDITS 16
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	NQF LEVEL 7 CREDITS 8
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	NQF LEVEL 7 CREDITS 16
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	NQF LEVEL 7 CREDITS 8
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	NQF LEVEL 7 CREDITS 16
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	NQF LEVEL 7 CREDITS 16
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	NQF LEVEL 7 CREDITS 8
Title: Agricultural Marketing		
Module outcomes:		
To able to demonstrate understanding of the principles of agricultural marketing and price analysis. Students be able to apply agricultural marketing and risk management principles. Students will be able to understand the role of agricultural marketing and risk management in South Africa and wide variety of settings.		
Module code: AECM 325	Semester 2	NQF LEVEL 7 CREDITS 8
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	NQF LEVEL 8 CREDITS 8
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 able to function within a group for mutual support, sustenance to peers for professional growth and development.		
Module Code: AECM 413	Semester 1	NQF LEVEL 8 CREDITS 16
Title: Quantitative Methods in Agricultural Economics		

Module Outcomes:		
To be able to understand and 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	NQF LEVEL 8 CREDITS 16
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 including the application of single equation models		
Module Code : AECM 415	Semester 1	NQF LEVEL 8 CREDITS 16
Title: Agribusiness Management		
Module Outcomes:		
To be able to apply production, financial, marketing, human resource and risk management principles to the three sectors of agribusiness environment and a wide variety of agricultural related business settings.		
Module Code: AECM 421	Semester 2	NQF LEVEL 8 CREDITS 8
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	NQF LEVEL 8 CREDITS 16
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	NQF LEVEL 8 CREDITS 8
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 agricultural finance principles as they are used in a wide variety of settings. Use the techniques of financial and economic analysis to assess economic viability and loan repayment ability of a farm.		
Module code: AECM 424	Semester 2	NQF LEVEL 8 CREDITS 8
Title: Agriculture and Economic Development		
Module outcomes:		
To able to understand the economic problems of agriculture in developing communities/countries. Students will be able to analyse agriculture's role in the development of underdeveloped communities/countries; identify barriers to agricultural development and to examine critically remedial agricultural policies and well-known tools of economic analysis to foster more rapid development. Thus be 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	NQF LEVEL 6 CREDITS 16
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	NQF LEVEL 7 CREDITS 8
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	NQF LEVEL 6 CREDITS 16
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 communication process, identify different extension teaching methods and understanding of extension program planning and management concepts.		
Module code: AEXM 212	Semester 1	NQF LEVEL 6 CREDITS 8
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	NQF LEVEL 6 CREDITS 8
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 324	Semester 2	NQF LEVEL 7 CREDITS 8
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 CROP SCIENCES SCIENCE

Module code :CSDM 111	Semester 1	NQF LEVEL 5 CREDITS 12
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	NQF LEVEL 5 CREDITS 12	
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	NQF LEVEL 6 CREDITS 16	
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 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.			
Module code: CSDM 212	Semester 1	NQF LEVEL 6 CREDITS 12	
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. Students should be conversant in climate change issues including climate change mitigation and adaptation.			
Module code: CSDM 213	Semester 1	NQF LEVEL 6 CREDITS 8	
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 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..			
Module code: CSDM 214	Semester 1	NQF LEVEL 6 CREDITS 8	
Title: Farm Practical I			
Module outcomes:			
Practical skills in the production of vegetable. Ability to identify weeds, insects and diseases associated with all aspects of crop production: vegetables, field crops and orchards. Application of appropriate management and control measures for pests and diseases. 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 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 and crop production programmes.			
Module code: CSDM 215	Semester 2	NQF LEVEL 6 CREDITS 8	
Title: Vegetable Production			

Module outcomes:			
Learners will be able to select and grow vegetables in specific agro-ecological regions of South Africa.. 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 221	Semester 2	NQF LEVEL 6	CREDITS 16
Title: Principles of Crop Improvement			
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.			
Module code: CSDM 222	Semester 2	NQF LEVEL 6	CREDITS 16
Title: Soil fertility and Fertilizers			
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 for various crop types under different agro-ecological regions.			
Module code: CSDM 223	Semester 2	NQF LEVEL 6	CREDITS 12
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 224	Semester 2	NQF LEVEL 6	CREDITS 8
Title: Farm practical II			
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.			
Module code: CSDM 225	Semester 2	NQF LEVEL 6	CREDITS 8
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. 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 311	Semester 1	NQF LEVEL 7	CREDITS 8
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	NQF LEVEL 7 CREDITS 16
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 boomspray calibration. Introduce new information about plant protection to farmers. Be able to guide and supervise farmers regarding plant protection. Understand the quarantine /Phytosanitary regulations of RSA		
Module code: CSDM 315	Semester 1	NQF LEVEL 7 CREDITS 8
Title: Pedology and Soil Classification		
Module outcomes: Upon completion of the module, learners should be able to: describe the factors and processes involved in the formation of soils, describe the different categories of horizons, explain the principles behind soil classification. explain how diagnostic horizons are employed in the classification of soils, describe the major systems of soil classification and be able to explain how the South African System of Soil Classification fits in other global systems.		
Module code: CSDM 321	Semester 2	NQF LEVEL 7 CREDITS 8
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	NQF LEVEL 7 CREDITS 16
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. Be able to supervise and guide farmers how to control weeds. Be able to disseminate to farmers new weeds management technology. Understand the use of selective and non-selective herbicides. Be competent in knapsack and boom sprayer calibration		
Module code: CSDM 323	Semester 6	NQF LEVEL 7 CREDITS 16
Title: Elements of Agric. Microbiology		
Module outcomes: Upon completion of the module, learners should be able to describe the different groups of microorganisms that are of significance in agriculture. Explain the function of these groups of microorganisms in agricultural productivity, explain how environmental factors and soil management techniques influence the dissemination and control of microorganisms of significance in agriculture and apply knowledge of the ecological and nutritional requirements of the major groups of microorganisms in designing environmentally friendly methods of disease control		
Module code: CSDM 324	Semester 6	NQF LEVEL 7 CREDITS 16
Title: Elementary Irrigation		
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 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 325	Semester 1	NQF LEVEL 7 CREDITS 8	
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.			

MA.2.8 BSc AGRIC in CROP SCIENCES

Module code: CSPM 211	Semester 1	NQF LEVEL 6 CREDITS 16	
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	NQF LEVEL 6 CREDITS 12	
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. Be conversant with climate change adaptation and mitigation strategies in agriculture			
Module code: CSPM 213	Semester 1	NQF LEVEL 6 CREDITS 12	
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	NQF LEVEL 6 CREDITS 16	
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	NQF LEVEL 6 CREDITS 16	
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	NQF LEVEL 6 CREDITS 12
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. Knowledge of the effect of agricultural activities on soil degradation and vice versa will also be gained. Learners at the end of the module will be able to identify and describe different strategies and management techniques used in controlling soil degradation.		
Module code: CSPM 224	Semester 2	NQF LEVEL 6 CREDITS 16
Title: Agricultural Microbiology		
Module outcomes: The learners will be able to identify and describe microorganisms that are commonly present in 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 of the role of these microorganisms in nutrient cycling in agriculture and how to control the dissemination of microorganisms that are pathogenic to plants and animals		
Module code: CSPM 311	Semester 1	NQF LEVEL 7 CREDITS 8
Title: Agromony 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 current challenges and topical issues in the production of the crop and related areas of research focus.		
Module code: CSPM 312	Semester 1	NQF LEVEL 7 CREDITS 16
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 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	NQF LEVEL 7 CREDITS 16
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 understand and interpret horticultural research articles. Learners should be knowledgeable in organic production of vegetable.		
Module code: CSPM 321	Semester 2	NQF LEVEL 7 CREDITS 8
Title: Agromony of Winter Crops		
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. 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	NQF LEVEL 7 CREDITS 16
Title: Weeds and Weed Control		

Module outcomes:			
Learners should have an indepth understanding of the biology of agricultural weeds. Learners should also be able to identify weed species for water bodies, and ethnobotany. 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	NQF LEVEL 7	CREDITS 16
Title: Fruits Production			
Module outcomes:			
Ability to select appropriate fruit crops for specific 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	NQF LEVEL 7	CREDITS 16
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 thy 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	NQF LEVEL 7	CREDITS 8
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	NQF LEVEL 8	CREDITS 8
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	NQF LEVEL 8	CREDITS 16
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	NQF LEVEL 8	CREDITS 8
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. Learners will be equipped with mushroom production technology. Conduct projects to demonstrate ability of project management. Be able to add value (post-harvest processing) to horticultural produce in RSA.			
Module code: CSPM 414	Semester 1	NQF LEVEL 8 CREDITS 8	
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	NQF LEVEL 8 CREDITS 16	
Title: Pedology and Soil Classification			
Module outcomes:			
Students will understand soil formation with 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	NQF LEVEL 8 CREDITS 8	
Title: Soil Physics			
Module outcomes:			
Learners will be able to appreciate the role of the three phases of soil in agriculture and the constraints that they present in plant growth. They will know the basic concepts of transport and retention of water and solutes in the soil and comprehend transfer processes for water, air, solutes, and heat in soils. 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	NQF LEVEL 8 CREDITS 8	
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	NQF LEVEL 8 CREDITS 16	
Title: Project and Seminar I			
Module outcomes:			
Able to prepare and submit research project proposal. Conduct a critical review of literature on a topic submitted. Be able to present a paper/ proposal at a seminar.			
Module code: CSPM 421	Semester 2	NQF LEVEL 8 CREDITS 16	
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	NQF LEVEL 8 CREDITS 16	
Title: Crop Protection			
Module outcomes: Ability to understand and apply scientific principles in practical crop protection.coveirng the following: Entomology, Plant Pathology and Nematology. Should have understanding of Principles of Integrated Pest Management Programme. Under Entomology the Learners should should have an in-depth knowlledge of insect pest classification focusing on the following important Genera: Hymenoptera, Coleoptera, and Lepidoptera. Under Plant Pathology the Learners should be knowledgeable in Plant Bacteriolgy, Mycology and Virologyt, 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 424	Semester 2	NQF LEVEL 8 CREDITS 16	
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 different 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.			
Module code: CSPM 427	Semester 2	NQF LEVEL 8 CREDITS 8	
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	NQF LEVEL 8 CREDITS 16	
Title: Project and Seminar II			
Module outcomes: Learners will be able to conduct and manage research under supervision ,Able to analyze, criticize and interpret data and scientific literature in crop and soil science .Able to communicate research results through an oral presentation / seminar, Able to write a scientific report.			

MA.2.9 BIOLOGY

NEW CODE BIYM 111	CREDITS 12	SEMESTER 1	NQF LEVEL 5
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	NQF LEVEL 5
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	NQF LEVEL 5
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	NQF LEVEL 5
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	NQF LEVEL 5
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	NQF LEVEL 5
Title: Systems physiology			
Module outcomes:			

<p>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.</p>			
CODE SFBM 171	CREDITS 12	SEMESTER 1	NQF LEVEL 5
Title: Introduction to cell biology			
Module outcomes:			
<p>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.</p>			
CODE SFBM 172	CREDITS 12	SEMESTER 1	NQF LEVEL 5
Title: Introduction to biological concepts			
Module outcomes:			
<p>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.</p>			
OLD CODE BGY 103 NEW CODE BGYM 113	CREDITS 12	SEMESTER 1	NQF LEVEL 5
Title: Introductory biology			
Module outcomes:			
<p>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.</p>			
BGYM 123	CREDITS 12	SEMESTER 2	NQF LEVEL 5
Title: Plant systematics and Lower invertebrates			
Module outcomes:			
<p>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</p>			

covered, principles of Taxonomy and species concept, overview of speciation and classification systems and overview of phylogenetics and systematics relationships.			
BGYM 212	CREDITS 8	SEMESTER 1	NQF LEVEL 6
Title: Introductory genetics			
Module outcomes:			
<p>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.</p>			
BGYM 214	CREDITS 8	SEMESTER I	NQF LEVEL 6
Title: Bacteriology and Microbial ecology			
Module outcomes:			
<p>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.</p>			
OLD CODE BGY 214	CREDITS 8	SEMESTER 1	NQF LEVEL 6
NEW CODE BGYM (211)			
216	Title: Elements of Ecology and Biostatistics I		
Module outcomes:			
<p>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 quantitative 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.</p>			
NEW CODE BGYM 215	CREDITS 12	SEMESTER 1	NQF LEVEL 6
Title: Taxonomy			
Module outcomes:			
<p>This module introduces learners to the concept of general classification based on common structural and functional similarities. Upon completion of this module, learners are expected to be able to demonstrate an understanding on the meanings of taxonomy as a practical subject and outlining its significance in biodiversity and conservation studies. Learners are also expected clearly elaborate on the phylogenetic relationships among various taxa and also based on various taxonomic data. Learners are also expected to properly explain the basic principles of phenetics and cladistics as methods of classification and discussing the applications of taxonomy in resolving classification conflicts in our day-to-day life situations.</p>			
CODE BGYM 225	CREDITS 8	SEMESTER 2	NQF LEVEL 6

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.			
227	OLD CODE BGY 254 NEW CODE BGYM (221)	CREDITS 8	SEMESTER 2 NQF LEVEL 6
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.			
314	OLD CODE BGY 263 NEW CODE BGYM (222)	CREDITS 16	SEMESTER 2 NQF LEVEL 7
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), sewerage treatment and water treatment, environmental cleaning and Bioremediation.			
226	OLD CODE BGY 273 NEW CODE BGYM (224)	CREDITS 8	SEMESTER 2 NQF LEVEL 6
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			

entegument 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

NQF LEVEL 6

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 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.

OLD CODE BGY 314

NEW CODE BGYM 316

CREDITS 16

SEMESTER 1

NQF LEVEL 6

Title: **Advanced Ecology and Biostatistics II**

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.

OLD CODE BGY 334

NEW CODE BGYM 315

CREDITS 16

SEMESTER 1

NQF LEVEL 7

Title: **Systematics**

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.

OLD CODE BGY 374

NEW CODE BGYM 324

CREDITS 16

SEMESTER 2

NQF LEVEL 7

Title: **Applied Molecular Genetics**

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.

OLD CODE BGY 384	CREDITS 16	SEMESTER 2	NQF LEVEL 7
NEW CODE BGYM 325			
Title: Developmental Biology			
Module outcomes:			
<p>This module provides an integrated, broad-spectrum understanding of biological principles governing organisational 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.</p>			

A. BOTANY AND ZOOLOGY

BOTANY

PLKN 212	CREDITS 16	SEMESTER 1	NQF LEVEL 7
Title: Plant Water Relations			
Module outcomes:			
<p>The module covers the demonstration of the importance of plants to sustain life on earth and how do the intricate physiological mechanisms, elucidated by plant physiologists over the last century, operate in the natural environment.; the dynamic and analytical character of plant structures; the structure and function of organelles in eukaryotic cells; the structure and function of primary plant tissue; the structure and function of primary and secondary plant organs, with emphasis on (a) the absorption and transport of water in plants (b) Mineral nutrition and the absorption of nutrients (c) The transport of photo-assimilate and source/receiver relations in plants. Plant hormones. Plant physiological, cellular and molecular adaptations for growth and survival in a range of environments; oxidative stress. Life at the extremes: heat, cold, freezing.</p> <p>On successful completion of this module students should be able to:</p> <p>(1) Describe how plants regulate their growth and development. (2) Provide an integrated knowledge and understanding of plant responses and structure plus physiological adaptations to the environment. (3) Demonstrate how plants exist in a range of extreme environments. (4) Demonstrate knowledge and understanding of relevant molecular and physiological techniques that allows elucidation of such plant responses to their growing environment.</p>			
PLKS 221	CREDITS 16	SEMESTER 2	NQF LEVEL 7
Title: Plant Systematics and Phytogeography			
Module outcomes:			
<p>On completing the module the student should be able to demonstrate fundamental botanical</p>			

knowledge and insight into: (i) the historical development, importance and essence of systematics, (ii) the meaningfulness of biodiversity studies and the uniqueness of South African flora, (iii) resources of variation in characteristics and use of these resources in classification systems, especially from a phylogenetic viewpoint, (iv) the basic principles of phytogeography and its patterns in South Africa, (v) the identification processes and principles to identify flower plant families, (vi) the rules that underlie plant nomenclature, and (vii) the practices followed in a herbarium and during plant collection; to demonstrate skills in the use of the necessary equipment to collect, press, dry, and mount plants and integrate them into the herbarium; to demonstrate the ability to compile and use a dichotomous key; to demonstrate the skills in using a stereomicroscope and dissection set to dissect flowers. to demonstrate competency as an individual to investigate the taxonomy of a plant species by researching, analysing and integrating relevant scientific information, and to communicate findings creatively to peers in written reports and orally; to investigate, as a member of a group, biodiversity crises by researching, analysing and integrating relevant scientific information, and by communicating findings to peers in a ethically responsible manner in written reports and orally.

PLKS 311	CREDITS 32	SEMESTER 1	NQF LEVEL 7
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Title: **PlanT Physiology: Energy Conservation and metabolism**

Module outcomes:

This module covers major biochemical and physiological aspects of photosynthesis, respiration, resource capture and growth at both the cell and whole plant level. Supporting practical's will be designed to examine both the light and stromal reactions of photosynthesis and to investigate the role of light in seed germination and plant development.

On successful completion of this module students should be able to:

(1) Describe how plants perceive light, the photobiology involved during the absorption of light energy, the construction and functioning of the photosynthesis apparatus in the thylakoids, as well as the control thereof and the mechanism to protect it against excessive light. (2) Describe the assimilation of CO₂ by the Calvin cycle, and the physiology and biochemistry of photorespiration. (3) Describe how plants use light as both a source of energy and an environmental signal, the various pathways of photosynthesis at the level of the cell and the whole plant (4) Describe the interplay between photosynthesis and respiration in a plant cell (5) Describe the role of light in controlling germination, growth and flowering in higher plants. Towards the understanding of plant processes and interpretation of data; to demonstrate the ability to identify plant physiological problems; to research, analyse and integrate relevant scientific information, and to communicate findings to peers in a ethically responsible manner in written reports and orally.

BOTM 321	CREDITS 32	SEMESTER 2	NQF LEVEL 7
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Title: **Plant Ecology**

Module outcomes:

On completing the module the student should be able to demonstrate a well-rounded and systematic knowledge of: (i) concepts and interactions of ecological processes and plant growth dynamics in terrestrial ecosystems, (ii) functioning and use of inland aquatic environments (dams

and rivers), especially with reference to the occurrence of different algae, as well as the physical, biological and chemical impact thereof on these systems, (iii) how plants are adapted to survive in different habitats, (iv) to demonstrate skills to apply the principles of landscape ecology and plant growth diversity, by using different plant growth surveying and multivariable data processing techniques; to demonstrate the ability to identify plant ecological problems and research, with special reference to nowadays practical ecology problems such as desertification and the succession of woody plants into grasslands in rural areas, analyse and integrate relevant scientific information and data collected, and to communicate findings to peers in an ethically responsible manner in written reports and orally.

ZOOLOGY

ZOOM 211	CREDITS 16	SEMESTER 1	NQF LEVEL 7
Title: Morphology: Higher Invertebrate and Vertebrates			
Module outcomes: On completing the module the student should be able to demonstrate fundamental knowledge and informed insight into specialised organs of different kinds of animals, as well as into several aspects of morphology of invertebrates and vertebrates. This includes special adaptations of invertebrates and vertebrates to enable them to survive in their respective environments. Students should demonstrate the ability to complete laboratory projects and manage invertebrate collections as a member of a group and to communicate the results to peers in the format of a written report and as an oral talk.			
DRKS 221	CREDITS 16	SEMESTER 2	NQF LEVEL 7
Title: Comparative Animal Physiology			
Module outcomes: On completing the module the student should be able to demonstrate fundamental knowledge and informed insight into specialised breathing organs of different kinds of animals, as well as into several aspects of the physiology, including respiration, thermoregulation, energy metabolism, osmotic regulation and movement of different animal groups; to demonstrate skills to analyse and explain the physico-chemical properties of the environment, with reference to their bearing on the gas exchange in the specialised breathing organs of different animals; to demonstrate skills to set up and conduct laboratory experiments regarding ammoniac excretion, carbon dioxide respiration, glomerular filtration, oxygen consumption and the measurement of soluble oxygen; to demonstrate the ability to complete laboratory projects as a member of a group and to communicate the results to peers in the format of a written report and as an oral talk.			
DRKS 311	CREDITS 32	SEMESTER 1	NQF LEVEL 7
Title: Ecology			
Module outcomes: On completing the module the student should be able to demonstrate well-rounded and systematic knowledge and insight into ecology and all its components and consequences and to relate it to other aspects of zoology and other subject fields; to demonstrate skills to describe the basic components of an ecosystem, interactions between organisms, as well as their interactions with the abiotic environment, and to research and describe the impact of human activities on the			

ecosystem by making use of appropriate statistics and models; to demonstrate the ability as an individual and/or as member of a group, to identify and characterise ecological problems such as global warming, to research relevant literature, to collect data and to communicate possible solutions to peers in an ethical and responsible way, in writing and orally

ZOOM 321

CREDITS 32

SEMESTER 2

NQF LEVEL 7

Title: **Veterinarian Parasitology**

Module outcomes:

By the end of the lectures and practical participants should be able to:

1. Discuss the **systematic** of parasites of medical importance in relation to transmission, prevention and control
2. Review the key features of the **epidemiology** of major parasites in animals and humans, including the role of animal and/or human role in transmission
3. Explain the development of parasites in the animal and human body in relation to clinical signs and potential pathology, including an outline of key interactions between parasites and immune and genetic host factors
4. Recognise the role of parasites in animal and humans including the potential interactions between infection with specific parasites and other agents of disease
5. Recognise parasites microscopically and relate their presence (or absence) to patient management
6. Discuss current approaches to the control, elimination and eradication of selected parasites of medical importance
7. Indicate key developments in research on selected parasites and recognise their importance to our understanding of epidemiology and developments in control
8. Discuss the beneficial parasites for agriculture importance (Entomopathogenic nematode).

MA.2.10 CHEMISTRY

Module code: MCHE114

Semester 1

**NQF LEVEL 5 CREDITS
12**

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	NQF LEVEL CREDITS 12	5
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	NQF LEVEL CREDITS 8	6
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	NQF LEVEL CREDITS 8	6
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	NQF LEVEL 6	CREDITS 8
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	NQF LEVEL 6	CREDITS 8
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: MCHE315	Semester 1	NQF LEVEL 7	CREDITS 16
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: MCHE316**Semester 1****NQF LEVEL
CREDITS 16****7****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: MCHE321**Semester 2****NQF LEVEL
CREDITS 16****7****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: MCH322	Semester 2	NQF LEVEL 7	CREDITS 16
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, synthesize, isolate, wash, hand dry coordination compounds. Use scientific instruments to run UV-visible and IR spectra, handle chemicals and equipment safely in the laboratory.			
Code: BCHS 211	Semester 1	CREDITS 8	NQF LEVEL 6
Title: Introduction to Biochemistry I			
Purpose:			
To outline the structural and molecular chemistry of water, 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 Biochemistry II			
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. To also give an overview Introduction to Carbohydrates and also Lipids.			
	Semester 2	CREDITS 8	NQF LEVEL 6
Title: Metabolic Processes I			
Purpose:			
To explain the modern concepts in bioenergetics (oxidative phosphorylation). To outline the process of carbohydrate metabolism and its regulation (glycolysis, citric acid cycle, pentose phosphate pathway, gluconogenesis, glycogen degradation and synthesis).			
Code: BCHS 222	Semester 2	CREDITS 8	NQF LEVEL 6
Title: Metabolic Processes II			
Purpose:			
To describe lipid metabolism and its regulation (degradation and synthesis fatty acids). To demonstrate an understanding of amino acid metabolism and their conversion to specialized products. 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 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, 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.2.11 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.2.12 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. 2.13 **BOTANY**

PLKN 212	CREDITS 16	SEMESTER 1	NQF LEVEL 7
<p>Title: Plant Water Relations</p> <p>Module outcomes:</p> <p>The module covers the demonstration of the importance of plants to sustain life on earth and how do the intricate physiological mechanisms, elucidated by plant physiologists over the last century, operate in the natural environment.; the dynamic and analytical character of plant structures; the structure and function of organelles in eukaryotic cells; the structure and function of primary plant tissue; the structure and function of primary and secondary plant organs, with emphasis on (a) the absorption and transport of water in plants (b) Mineral nutrition and the absorption of nutrients (c) The transport of photo-assimilate and source/receiver relations in plants. Plant hormones. Plant physiological, cellular and molecular adaptations for growth and survival in a range of environments; oxidative stress. Life at the extremes: heat, cold, freezing.</p> <p>On successful completion of this module students should be able to:</p> <p>(1) Describe how plants regulate their growth and development. (2) Provide an integrated knowledge and understanding of plant responses and structure plus physiological adaptations to the environment. (3) Demonstrate how plants exist in a range of extreme environments. (4) Demonstrate knowledge and understanding of relevant molecular and physiological techniques that allows elucidation of such plant responses to their growing environment.</p>			
PLKS 221	CREDITS 16	SEMESTER 2	NQF LEVEL 7
<p>Title: Plant Systematics and Phytogeography</p> <p>Module outcomes:</p> <p>On completing the module the student should be able to demonstrate fundamental botanical knowledge and insight into: (i) the historical development, importance and essence of systematics, (ii) the meaningfulness of biodiversity studies and the uniqueness of South African flora, (iii) resources of variation in characteristics and use of these resources in classification systems, especially from a phylogenetic viewpoint, (iv) the basic principles of phytogeography and its patterns in South Africa, (v) the identification processes and principles to identify flower plant families, (vi) the rules that underlie plant nomenclature, and (vii) the practices followed in a herbarium and during plant collection; to demonstrate skills in the use of the necessary equipment to collect, press, dry, and mount plants and integrate them into the herbarium; to demonstrate the ability to compile and use a dichotomous key; to demonstrate the skills in using a stereomicroscope and dissection set to dissect flowers. to demonstrate competency as an individual to investigate the taxonomy of a plant species by researching, analysing and integrating relevant scientific information, and</p>			

to communicate findings creatively to peers in written reports and orally; to investigate, as a member of a group, biodiversity crises by researching, analysing and integrating relevant scientific information, and by communicating findings to peers in an ethically responsible manner in written reports and orally.

PLKS 311

CREDITS 32

SEMESTER 2

NQF LEVEL 7

Title: Plant Physiology: Energy Conservation and metabolism

Module outcomes:

On completing the module the student should be able to demonstrate a well-rounded and systematic knowledge of: (i) concepts and interactions of ecological processes and plant growth dynamics in terrestrial ecosystems, (ii) functioning and use of inland aquatic environments (dams and rivers), especially with reference to the occurrence of different algae, as well as the physical, biological and chemical impact thereof on these systems, (iii) how plants are adapted to survive in different habitats, (iv) to demonstrate skills to apply the principles of landscape ecology and plant growth diversity, by using different plant growth surveying and multivariable data processing techniques; to demonstrate the ability to identify plant ecological problems and research, with special reference to nowadays practical ecology problems such as desertification and the succession of woody plants into grasslands in rural areas, analyse and integrate relevant scientific information and data collected, and to communicate findings to peers in an ethically responsible manner in written reports and orally.

BOTM 321

CREDITS 32

SEMESTER 2

NQF LEVEL 7

Title: Plant Physiology: Energy Conservation and metabolism

Module outcomes:

On completing the module the student should be able to demonstrate a well-rounded and systematic knowledge of: (i) concepts and interactions of ecological processes and plant growth dynamics in terrestrial ecosystems, (ii) functioning and use of inland aquatic environments (dams and rivers), especially with reference to the occurrence of different algae, as well as the physical, biological and chemical impact thereof on these systems, (iii) how plants are adapted to survive in different habitats, (iv) to demonstrate skills to apply the principles of landscape ecology and plant growth diversity, by using different plant growth surveying and multivariable data processing techniques; to demonstrate the ability to identify plant ecological problems and research, with special reference to nowadays practical ecology problems such as desertification and the succession of woody plants into grasslands in rural areas, analyse and integrate relevant scientific information and data collected, and to communicate findings to peers in an ethically responsible manner in written reports and orally.

MA. 2.14 ZOOLOGY

ZOOM 211	CREDITS 16	SEMESTER 1	NQF LEVEL 7
Title: Morphology: Higher Invertebrate sand Vertebrates			
Module outcomes: On completing the module the student should be able to demonstrate fundamental knowledge and informed insight into specialised organs of different kinds of animals, as well as into several aspects of morphology of invertebrates and vertebrates. This includes special adaptations of invertebrates and vertebrates to enable them to survive in their respective environments. Students should demonstrate the ability to complete laboratory projects and manage invertebrate collections as a member of a group and to communicate the results to peers in the format of a written report and as an oral talk.			
DRKS 221	CREDITS 16	SEMESTER 2	NQF LEVEL 7
Title: Comparitive Animal Physiology			
Module outcomes: On completing the module the student should be able to demonstrate fundamental knowledge and informed insight into specialised breathing organs of different kinds of animals, as well as into several aspects of the physiology, including respiration, thermoregulation, energy metabolism, osmotic regulation and movement of different animal groups; to demonstrate skills to analyse and explain the physico-chemical properties of the environment, with reference to their bearing on the gas exchange in the specialised breathing organs of different animals; to demonstrate skills to set up and conduct laboratory experiments regarding ammoniac excretion, carbon dioxide respiration , glomerular filtration, oxygen consumption and the measurement of soluble oxygen; to demonstrate the ability to complete laboratory projects as a member of a group and to communicate the results to peers in the format of a written report and as an oral talk.			

DRKS 311	CREDITS 32	SEMESTER 1	NQF LEVEL 7
Title: Ecology			
Module outcomes: On completing the module the student should be able to demonstrate well-rounded and systematic knowledge and insight into ecology and all its components and consequences and to relate it to other aspects of zoology and other subject fields; to demonstrate skills to describe the basic components of an ecosystem, interactions between organisms, as well as their interactions with the abiotic environment, and to research and describe the impact of human activities on the ecosystem by making use of appropriate statistics and models; to demonstrate the ability as an individual and/or as member of a group, to identify and characterise ecological problems such as global warming, to research relevant literature, to collect data and to communicate possible solutions to peers in an ethical and responsible way, in writing and orally			
ZOOM 321	CREDITS 32	SEMESTER 2	NQF LEVEL 7
Title: Vererinarian Parasitology			
Module outcomes:			

By the end of the lectures and practical participants should be able to:

1. Discuss the **systematic** of parasites of medical importance in relation to transmission, prevention and control
2. Review the key features of the **epidemiology** of major parasites in animals and humans, including the role of animal and/or human role in transmission
3. Explain the development of parasites in the animal and human body in relation to clinical signs and potential pathology, including an outline of key interactions between parasites and immune and genetic host factors
4. Recognise the role of parasites in animal and humans including the potential interactions between infection with specific parasites and other agents of disease
5. Recognise parasites microscopically and relate their presence (or absence) to patient management
6. Discuss current approaches to the control, elimination and eradication of selected parasites of medical importance
7. Indicate key developments in research on selected parasites and recognise their importance to our understanding of epidemiology and developments in control
8. **Discuss the beneficial parasites for agriculture importance (Entomopathogenic nematode).**

MA.2.13 COMPUTER SCIENCE

New code: CISM 112	Semester 2	NQF LEVEL 5 CREDITS 12
Title: Introduction to Computing		
Content Introduction and History of Computers. Number Systems. Boolean Algebra and Digital Logic Gates. CPU Internal Bus Organization. Computer Memory Components and organization. Input/Output Organizations, Standard and Devices. Introduction to Operating Systems. Introduction to Network organization and Architecture.		
Outcomes: List the main components of a computer and discuss 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. Describe simple machine architecture and programme execution using Assembling language. Write simple programmes using Java language.		
New code: CISM 122	Semester 2	NQF LEVEL 5 CREDITS 12
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	NQF LEVEL 5	CREDITS 12
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	NQF LEVEL 5	CREDITS 12
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 213	Semester 2	NQF LEVEL 6	CREDITS 8
Title: Algorithmic Design and 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 214	Semester 2	NQF LEVEL 6	CREDITS 8
Title: Imperative and Object-Oriented Programming			
Content: Imperative programming with procedures, modules and pointers, Hash tables and Binary trees. state and state change; declarations; basic statements; typed languages: simple algorithms and their implementation. Elements of the object model. Class encapsulation, Messages, inheritance and polymorphism, object storage management, and exception handling.. Abstraction, levels of abstraction. Encapsulation and interchangeability, modularity and hierarchy. Patterns, Procedures, Modules. Behaviour and State, Structural and behavioral diagrams, Instances, Classes and Methods, Classes as Objects and Initialization.			
Outcomes A student successfully completing this module should be able to: demonstrate understanding of the basic principles of imperative programming and its structure; use the basic concepts of Object Oriented Programming and write simple programs in Object environment as a problem solving tool.			
New code: CISM 225	Semester 2	NQF LEVEL 6	CREDIT 8

Title: Introduction to operating systems			
Content: Overview of operating systems. Operating system structure. Process management. Processes, CPU Scheduling and Process Synchronization. Concurrency and synchronization. Concurrent execution; Mutual exclusion problem and some solutions Deadlock; Models and mechanisms (Semaphores, monitors etc.). Multiprocessor issues. Scheduling. Deadlock and Starvation. Processor management. Scheduling and dispatch. Memory management. Virtual memory. Device management. File systems. Security, privacy and acceptable. Memory Management: Swapping and Partitions, Paging & Segmentations.			
Outcomes: A student successfully completing this module should be able to: demonstrate understanding of the services an operating system provides to users, processes, and other systems; discuss the various ways of structuring an operating system, demonstrate how operating systems are installed and customized and how they boot; explain communication in Client-Server Systems.			
New code: CISM 226	Semester 2	NQF LEVEL 6	CREDITS 8
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.			
New code: CISM 313	Semester 2	NQF LEVEL 7	CREDITS 16
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.			
New code: CISM 314	Semester 2	NQF LEVEL 7	CREDITS 16
Title: Principles of Compiler Design			
Content: Introduction to Compilation. General structure of a Compiler. Overview of compilation technology. Phases of Compilation – Lexical, Syntax and Semantic Analysis, Language translation systems. Parsing techniques. Run-time environments. Syntax-directed translation. Intermediate code generation and optimization. Regular Expressions, Finite-state Machines – DFA and NFA. Type Checking, Intermediate Code generations and Scanner generator tools, Grammars and Languages, Tokens, Lexeme			
Outcomes: A student successfully completing this module should be able to: describe the principles governing all phases of the compilation process; explain the role of each of the basic			

components of a standard Compiler; analyse the problems of and apply the methods and techniques to each phase of the compilation process; Apply standard techniques to solve basic problems that arise in compiler construction; explain how the Compiler can take advantage of particular processor characteristics to generate good code.

New code: CISM 327

Semester 2

NQF LEVEL 7 CREDITS 16

Title: Data Communication and Networks

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.

New code: CISM 326

Semester 2

NQF LEVEL 7 CREDITS 16

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.

MA.2.14 GEOGRAPHY

Module code: GEOM 113

Semester 1

NQF LEVEL 5 CREDITS 12

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	NQF LEVEL 5 CREDITS 12
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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	NQF LEVEL 6 CREDITS 8
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Title: Aspects of 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	NQF LEVEL 6 CREDITS 8
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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	NQF LEVEL 6 CREDITS 8
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Title: Aspects of 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	NQF LEVEL 6 CREDITS 8
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	NQF LEVEL 7 CREDITS 16
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	NQF LEVEL 7 CREDITS 16
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	NQF LEVEL 7 CREDITS 16
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	NQF LEVEL 7 CREDITS 16
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.2.15 ELECTRONICS

Module code: SFEM 171	Year 1 (Foundation)	NQF LEVEL 5 CREDITS 12
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: SFEM 172	Year 2 (Foundation)	NQF LEVEL 5 CREDITS 12
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: ELYM115	Semester 1	NQF LEVEL 5 CREDITS 12
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	NQF LEVEL 5 CREDITS 12
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	NQF LEVEL 6 CREDITS 16
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	NQF LEVEL 6	CREDITS 16
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	NQF LEVEL 7	CREDITS 16
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	NQF LEVEL 7	CREDITS 16
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	NQF LEVEL 7	CREDITS 16
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	NQF LEVEL 7	CREDITS 16
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.2.16 APPLIED MATHEMATICS

Module code: APMM 117	Semester 1	NQF LEVEL 5	CREDITS 12
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	NQF LEVEL 5 CREDITS 12
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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	NQF LEVEL 7 CREDITS 16
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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	NQF LEVEL 7 CREDITS 16
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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	NQF LEVEL 8 CREDITS 16
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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	NQF LEVEL 8 CREDITS 16
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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	NQF LEVEL 8 CREDITS 16
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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	NQF LEVEL 8 CREDITS 16
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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 Chebychev 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.

MA2.17 MATHEMATICS

Module code: MAYM 116	Semester 1	NQF LEVEL 5 CREDITS 12
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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	NQF LEVEL 5 CREDITS 12
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	NQF LEVEL 5 CREDITS 12
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	NQF LEVEL 5 CREDITS 12
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	NQF LEVEL 6 CREDITS 16
Title: Linear Algebra		
Module outcomes: Demonstrate problem solving skills and the fundamental knowledge of systems of linear equations, matrices, row echelon form, Gaussian elimination, homogenous systems, matrix algebra, elementary matrices, inverse matrices, determinants, properties of determinants, co-factor 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	NQF LEVEL 6 CREDITS 16

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****NQF LEVEL 8 CREDITS 16****Title: Real Analysis****Module outcomes:**

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.

Module code: MAYM 318**Semester 1****NQF LEVEL 8 CREDITS 16****Title: Differential Equations****Module outcomes:**

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.

Module code: MAYM 327**Semester 1****NQF LEVEL 8 CREDITS 16****Title: Complex Analysis****Module outcomes:**

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.

Module code: MAYM 328	Semester 1	NQF LEVEL 8	CREDITS 16
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Title: **Abstract Algebra**

Module Outcomes:

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, 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.

M.A 2.18 Indigenous Knowledge Systems

Module code:AGLE 111	Semester: 1	NQF level: 5	CREDITS 12
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Title: **Introduction to Academic Literacy**

Module Outcomes:

- Demonstrate 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
- Be able to 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: IKSM 111	Semester: 1	NQF level: 5	CREDITS 12
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Title: **The Nature and Patterns of Indigenous Knowledge Systems (IKS) and Innovations**

Module Outcomes:

At the end of the module the students will be able to demonstrate an understanding of the nature and patterns of African indigenous knowledge systems (IKS) and innovations.

Module code: IKSM 112	Semester: 1	NQF level: 5	CREDITS 12
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Title: **African Indigenous Languages and Communication Systems**

Module Outcomes: At the end of the module students will be able to analyze the impact of indigenous languages and communication systems in addressing the psycho - social and cultural

needs of the African society.		
Module code: IKSM 113	Semester: 1	NQF level: 5 CREDITS 12
Title: Introduction to Health Care Systems in relation to Indigenous Knowledge Systems (IKS)		
Module Outcomes: At the end of the module students will be able to analyze health care systems in relation to IKS.		
Module code: IKSM 114	Semester: 1	NQF level: 5 CREDITS 12
Title: The Role of Indigenous Knowledge Systems in Climate Change		
Module Outcomes: At the end of the module students will be able to identify the causes and effects of climate change and the role of IKS in mitigating its effects on sustainable community livelihood.		
Module code: IKSM 115	Semester: 1	NQF level: 5 CREDITS 12
Title: Introduction to African Indigenous Life Skills Education		
Module Outcomes: At the end of the module students will demonstrate knowledge and critical understanding of the concepts and approaches to life skills and counseling from an African indigenous socio - cultural perspective.		
Module code:AGLE 121	Semester: 1	NQF level: 5 CREDITS 12
Title: Academic Literacy		
Module Outcomes: Demonstrate fundamental knowledge of appropriate computer programmes, as well as apply learning, listening, reading and writing strategies, use academic language register and read and write academic texts, in order to function effectively in the academic environment; As an individual and a member of a group communicate effectively orally and in writing in an ethically responsible and acceptable manner in an academic environment; As an individual and a member of a group, find and collect scientific knowledge in a variety of study fields, analyse, interpret, evaluate the texts, and in a coherent manner synthesize and propose solutions in appropriate academic genres by making use of linguistic conventions used in formal language registers.		
Module code: IKSM 121	Semester: 2	NQF level: 5 CREDITS 12
Title: A Historiography of African Indigenous Science and Technology		
Module Outcomes: At the end of the module students will able to evaluate and provide an analysis of the development of African indigenous science and technology.		
Module code: IKSM 122	Semester: 2	NQF level: 5 CREDITS 12
Title: Introduction to Tools of Indigenous Knowledge Management		
Module Outcomes: At the end of the module students will be able to generate, populate and manage IKS data using ICT tools.		
Module code: IKSM 123	Semester: 2	NQF level: 5 CREDITS 12
Title: The Use and Roles of Signs and Symbols in African Communities		
Module Outcomes: At the end of the module students will be able to analyze the use and roles of signs and symbols in indigenous languages and communication systems as they link up with the needs of the different African cultures and societies.		
Module code: IKSM 124	Semester: 2	NQF level: 5 CREDITS 12
Title: The Nature and Roles of African Indigenous Health Care Providers		
Module Outcomes: At the end of the module students will demonstrate an understanding of the nature, roles and the impact of health care providers in African indigenous health care systems.		
Module code: IKSM 125	Semester: 2	NQF level: 5 CREDITS 12

Title: African Indigenous Food Security Systems		
Module Outcomes: At the end of the module students will be able to analyze the difference between Western and African Indigenous food security systems and the importance of interfacing the two food security systems for sustainable community livelihood in Southern Africa.		
Module code: IKSM 211	Semester: 1	NQF level: 6 CREDITS 12
Title: The Rights of Indigenous Peoples		
Module Outcomes: At the end of the module students will be able to scrutinize the concerns of indigenous peoples and the national, regional and international legal mechanisms to address them.		
Module code: IKSM 212	Semester: 1	NQF level: 6 CREDITS 12
Title: African Cultural Astronomy		
Module Outcomes: At the end of the module students will be able to analyze the nature and characteristic of African cultural astronomy and its role in sustainable community livelihood.		
Module code: IKSM 213	Semester: 1	NQF level: 6 CREDITS 12
Title: The Nature and Characteristics of African Indigenous Health Care Systems		
Module Outcomes: At the end of the module, students will be able to analyze critically, the nature, characteristics and limitations of the different health care systems in the world.		
Module code: IKSM 214	Semester: 2	NQF level: 6 CREDITS 12
Title: African Indigenous Knowledge Development and Management Systems		
Module Outcomes: At the end of the module, student will be able to demonstrate an understanding of the differences and similarities in the nature and characteristics of African indigenous and Western knowledge development and management systems.		
Module code: IKSM 215	Semester: 2	NQF level: 6 CREDITS 12
Title: Implications of Intellectual Property Rights (IPR) on Indigenous Knowledge Systems (IKS) / Traditional Knowledge (TK)		
Module Outcomes: At the end of the module students will be able to demonstrate an understanding of the meaning, nature, characteristics, importance and challenges of protecting IKS / TK using existing IPRs.		
Module code: WVCS 215	Semester: 2	NQF level: 6 CREDITS 12
Title: Understanding the Cultural World		
Module Outcomes: Have a fundamental knowledge base of a selection of world views and ideologies; Demonstrate a critical understanding of the nature and functions, as well as the contemporary manifestations of these world view and ideologies; Have the ability to understand the interrelatedness of IKS related phenomena in the natural and social systems; Analyse and evaluate IKS case studies based on core issues of our time, such as poverty, climate change, human rights, HIV/AIDS, power abuse, corruption, racism, xenophobia, etc; Articulate clearly their personal world views and use them as a point of departure for arguing and communicating feasible solutions to core issues and problems of our time in a typical academic manner.		
Module code: IKSM 221	Semester: 2	NQF level: 6 CREDITS 12
Title: African Indigenous Architecture and Design		
Module Outcomes: At the end of the module students will be able to critically interrogate theories and principles on African architectural designs and its contribution to contemporary designs and housing needs.		

Module code: IKSM 222	Semester: 2	NQF level: 6 CREDITS 12
Title: African Indigenous Approaches to Peace and Conflict Resolution		
Module Outcomes: At the end of the module students will be able to evaluate the efficacy African indigenous approaches and institutions for conflict transformation and peace - building for sustainable community livelihood.		
Module code: IKSM 223	Semester: 2	NQF level: 6 CREDITS 12
Title: Socio - Cultural Protocols associated with African Traditional Medicine and Health Care Systems		
Module Outcomes: At the end of the module students will be able to compare and contrast the socio - cultural protocols associated with African traditional medicine and health care systems.		
Module code: IKSM 224	Semester: 2	NQF level: 6 CREDITS 12
Title: African Indigenous Cultural, Bio - Diversity and Heritage		
Module Outcomes: At the end of the module students will be able to understand and apply concepts and theories associated with African indigenous cultural, bio - diversity and heritage.		
Module code: IKSM 225	Semester: 2	NQF level: 6 CREDITS 12
Title: African Indigenous Education		
Module Outcomes: At the end of the module students will demonstrate an understanding of the nature, objectives, structure and content of African indigenous education; the impact of colonialism and other forms of imperialism on pre - colonial education and the importance of interface between African indigenous and modern forms of education and technology (ICT).		

In years 3 and 4 students have elective options of choosing from a set of modules

Module code: IKSS 311	Semester: 1	NQF level: 7 CREDITS 16
Title: Introduction to African Ethno - mathematics		
Module Outcomes: At the end of the module, students will be able to demonstrate an understanding of the significance of African indigenous mathematics and its contribution to contemporary mathematics and science education.		
Module code: IKSM 312	Semester: 1	NQF level: 7 CREDITS 16
Title: Indigenous Medicinal and Nutritional Significance of Living Organisms.		
Module Outcomes: At the end of the module students will be able to compare medicinal and nutritional significance of different plant, insect and animal species in the African Indigenous and Western Health Care Systems; - demonstrate an understanding of the impact of the following factors on sustainable Health Care: <ul style="list-style-type: none"> • Climate Change • Socio-economic Status • Poverty • Policies • Behavioral and Social-Cultural issues • Immigration - Analyze critically, the interdependence between human beings and other living organisms from IKS Health Care perspective and its implications on any of the above factors .		
Module code: IKSM 313	Semester: 1	NQF level: 7 CREDITS 16
Title: Theories of Indigenous Community Innovation Systems and Technologies for Sustainable Livelihood		
Module Outcomes: At the end of the module, students will be able to develop critical understanding of the		

different debates on community innovation systems and technologies for sustainable livelihood.		
Module code: WVCS 315	Semester: 1	NQF level: 7 CREDITS 16
Title: Understanding the Cultural World		
Module Outcomes:		
Have a solid and systematic knowledge of the most important foundational issues in the field of IKS and demonstrate a critical understanding of the meta-theoretical assumptions underscoring foundational issues; Demonstrate knowledge and a critical understanding of specific forms of ethics that apply to the field of IKS , such as a personalised code of conduct or the general human rights charter, and be able to apply such forms of ethics discriminately to analyse, evaluate and pose possible solutions to some current themes or issues salient to the field of IKS; Demonstrate the ability to analyse, synthesise and critique the assumptions on which a chosen theme or issue are based, formulate a personal opinion about the theme or issue that gives evidence of an own coherent world view, and communicate the findings in a presentation making use of applicable technology, as well as in a proof-based report written in a typically academic format		
Module code: IKSM 321	Semester: 2	NQF level: 7 CREDITS 16
Title: African Indigenous Metallurgy 1		
Module Outcomes:		
At the end of the module, students will be able to analyze and apply the scientific and technological processes involved in African indigenous metallurgy for sustainable community livelihood.		
Module code: IKSM 322	Semester: 2	NQF level: 7 CREDITS 16
Title: African Indigenous Ethno mathematics II		
Module Outcomes:		
At the end of the module students will demonstrate critical knowledge and skills of African indigenous Ethno mathematics.		
Module code: IKSM 323	Semester: 2	NQF level: 7 CREDITS 16
Title: Comparative African Indigenous Textile Technologies		
Module Outcomes:		
At the end of the module students will acquire critical knowledge and skills of the scientific and technological processes involved in African indigenous textile technologies.		
Module code: IKSM 324	Semester: 2	NQF level: 7 CREDITS 16
Title: Indigenous Knowledge and Renewable Energy Sources for Sustainable Livelihood		
Module Outcomes:		
At the end of the module student will be able to demonstrate an understanding on the linkages between indigenous knowledge systems, sustainable renewable community energy systems, and poverty alleviation strategies in African local communities.		
Module code: IKSC 311	Semester: 1	NQF level: 8 CREDITS 16
Title: Comparative Western and African Indigenous Life Skills Education		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Demonstrate detailed knowledge of the theories and application of western and African indigenous life skills education. • Make a critical evaluation of the socio - cultural context of western and African indigenous life skills education. • Compare and contrast western and African life skills education. 		
Module code: IKSC 312	Semester: 1	NQF level: 8 CREDITS 16
Title: Comparative African Indigenous and Western Peace and Conflict Resolution Approaches		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Demonstrate detailed knowledge of indigenous and western peace and conflict resolution approaches. • Make an application of theories of indigenous and western peace and conflict resolution 		

- approaches.
- Compare and contrast between indigenous and western peace and conflict resolution approaches.
- Display a critical knowledge of indigenous and western peace and conflict resolution approaches.

Module code: IKSA 311	Semester: 1	NQF level: 8 CREDITS 16
Title: Impact of Climate Change on African Indigenous Food Security Systems		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Demonstrate knowledge and understanding of the theories and applications on the causes (natural and human) of climate change within the context of indigenous agriculture. • Demonstrate an understanding of the effects of climate change on sustainable indigenous community livelihoods. • Make a critical evaluation of the impact of climate change on African indigenous food security systems. • Make an evaluation the role of indigenous knowledge and systems in mitigating against the effects of climate change. 		
Module code: IKSH 312	Semester: 1	NQF level: 8 CREDITS 16
Title: African Indigenous Medicinal and Nutritional Significance of Living Organisms		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Demonstrate and understanding of the significance of living organisms as medicine and food. • Make an evaluation of the extent of interdependence between human beings and other living organisms from an indigenous Knowledge Systems health care perspective. • Make a critical analyse of the medicinal and nutritional significance of African indigenous living organisms 		
Module code: IKSM 313	Semester: 1	NQF level: 8 CREDITS 16
Title: Theories of African Indigenous Community Innovation Systems for Sustainable Livelihood		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Demonstrate detailed knowledge of the theories, concepts and applications associated with community innovation and technologies. • Compare and contrast between African community innovation and technologies for sustainable livelihood. • Make a critical evaluation of the role African community innovation and technologies on sustainable livelihood. • Make an analysis of African community innovation and technologies on sustainable livelihood. 		
Module code: IKSH 311	Semester: 1	NQF level: 8 CREDITS 16
Title: Comparative Health Care Systems		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Demonstrate an understanding of the theories of different health care systems in the world. • Make an application of theories of health care systems to the southern African region. • Compare and contrast different health care systems in the world. • Make an evaluation of the nature, characteristics and limitations of the different health care systems in the world 		
Module code: IKSH 314	Semester: 1	NQF level: 8 CREDITS 16
Title: Gender in African Indigenous Health Care Systems		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Demonstrate an understanding of the role of gender in African Indigenous Health Care Systems. • Make a critical analysis of the role of gender in African indigenous health care systems. • Make an evalaution on the relationship between gender, culture and science and 		

technology with regards to African Indigenous Health Care Systems.

Module code IKSA 321	Semester: 2	NQF level: 7 CREDITS 16
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Title: African Indigenous Agriculture and Sustainable Community Livelihood and Development Southern Africa

Module Outcomes: At the end of the module the students will be able to:

- Demonstrate an understanding of the role of African indigenous agriculture for sustainable community livelihoods in Southern Africa.
- Display detailed knowledge on the types and elements of African indigenous agriculture and their contribution to sustainability.
- Comprehend the role of African indigenous agriculture in community development in Southern Africa.
- Demonstrate a critical understanding of the challenges and prospects of indigenous agriculture for community livelihoods and development in the Southern African region..

Module code: IKSA 322	Semester: 2	NQF level: 8 CREDITS 16
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Title: Comparative African Indigenous Cultural, Bio-diversity and Heritage

Module Outcomes: At the end of the module students will be able to:

- Compare and contrast African indigenous and Western cultural, biodiversity and heritage.
- Demonstrate detailed knowledge and understanding of the concepts and theories associated with African indigenous cultural, biodiversity and heritage.
- Make a critical evaluation of African indigenous cultural, bio-diversity and heritage.
- Understand the relationships between African indigenous cultural, biodiversity and heritage.

Module code: IKSC 321	Semester: 2	NQF level: 8 CREDITS 16
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Title: African Traditional Governance and Democracy

Module Outcomes: At the end of the module student will be able to:

- Demonstrate detailed knowledge and understanding of the nature and characteristics of African traditional authority.
- Make an application of the theories and practices of African traditional authorities in the promotion of democracy and socio – economic development in local communities.
- Demonstrate detailed understanding of the role of African traditional authorities in the promotion of democracy and socio – economic development in local communities.
- Compare and contrast African traditional governance and western governance.

Module code: IKSC 322	Semester: 2	NQF level: 8 CREDITS 16
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Title: African Indigenous Music and Dance

Module Outcomes: At the end of the module student will be able to:

- Demonstrate detailed knowledge and understanding of the nature and characteristics of African indigenous music and dances.
- Make an application of the theories and concepts of different African indigenous music and dances.
- Compare and contrast African indigenous music and dances from different African cultures.

Module code: IKSC 323	Semester: 2	NQF level: 8 CREDITS 16
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Title: Gender in African Indigenous Arts and Culture

Module Outcomes: At the end of the module student will be able to:

- Demonstrate detailed knowledge of African indigenous arts and culture.
- Make an application of the theories and concepts of gender in African indigenous arts and cultural issues.
- Understand the roles of gender in African indigenous arts and cultural issues.

Module code: IKSH 321	Semester: 2	NQF level: 8 CREDITS 16
Title: African Indigenous Health Care Providers		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Demonstrate an understanding of the categories and roles of African indigenous health care providers. • Demonstrate detailed knowledge of the theories, challenges and prospects of African indigenous health care providers in the primary health realm. • Make an analysis of the practices of African indigenous health care providers. • Make an evaluation of the application of standard protocols by African indigenous health care providers. 		
Module code: IKSA 323	Semester: 2	NQF level: 7 CREDITS 16
Title: Comparative African Indigenous and Western Food Security Systems		
Module Outcomes: At the end of the module, students will be able to:		
<ul style="list-style-type: none"> • Compare and contrast African indigenous and western food security systems. • Demonstrate detailed knowledge of the components of African indigenous and western food security systems and their role in sustainable community livelihoods. • Evaluate the challenges and prospects of African indigenous and western food security systems. 		
Module code: IKSH 322	Semester: 2	NQF level: 8 CREDITS 16
Title: Indigenous Knowledge and Innovations in Public Health Care 1		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Demonstrate an understanding of the categories and roles of African indigenous health care Display detailed knowledge of the research, innovation and technologies in African public health. • Demonstrate understanding of the benefits of IK innovations in public health. • Make a critical analysis of the role of policy and institutions in promoting African indigenous knowledge (IK) and innovation systems in public health care. • Make an evaluation of the challenges and opportunities of African Indigenous Knowledge (IK) and Innovation Systems in Public Health Care. 		
Module code: IKSH 323	Semester: 2	NQF level: 8 CREDITS 16
Title: African Traditional Medicine and Health Care Systems II		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Demonstrate detailed knowledge of African traditional medical systems for sustainable community livelihood. • Display detailed knowledge of theories, concepts and practices of African traditional medical systems. • Make an evaluation of the role of African traditional medical systems on sustainable livelihood. 		
Module code: IKSC 413	Semester: 1	NQF level: 8 CREDITS 16
Title: African Indigenous Music and Drama		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Develop in-depth understanding of the nature, characteristics, principles and practices of different African indigenous music and drama. • Demonstrate an understanding of the theories, applications and concepts of different African indigenous music and drama. • Compare and contrast African indigenous music and drama from different African cultures. 		
Module code: IKSA 413	Semester: 1	NQF level: 8 CREDITS 16
Title: Indigenous Knowledge and Renewable Energy Sources for Sustainable Livelihoods II		
Module Outcomes: At the end of the module student will be able to:		
<ul style="list-style-type: none"> • Demonstrate detailed knowledge of the theories, concepts and applications of community - based renewable energy sources. 		

<ul style="list-style-type: none"> Demonstrate detailed knowledge of the macro and micro barriers of community - based renewable energy sources. Make and evaluation of the role of community - based renewable energy sources on sustainable livelihood. 		
Module code: IKSM 411	Semester: 1	NQF level: 8 CREDITS 16
Title: Recording and Using Indigenous Knowledge Systems (IKS)		
Module Outcomes: At the end of the module students will be able to demonstrate an understanding and skills of recording and using IKS for promoting sustainable community livelihood in local communities.		
Module code: IKSM 412	Semester: 1	NQF level: 8 CREDITS 16
Title: Qualitative and Quantitative Research Methods in Indigenous Knowledge Systems (IKS)		
Module Outcomes: At the end of the module students will demonstrate knowledge and skill of using qualitative and quantitative research methods for conducting research in IKS related issues.		
Module code: IKSM 413	Semester: 1	NQF level: 8 CREDITS 16
Title: African Indigenous Metallurgy II		
Module Outcomes: At the end of the module students will be able to analyze and apply the scientific and technological processes involved in African indigenous metallurgy for sustainable community livelihood.		
Module code: IKSM 421	Semester: 2	NQF level: 8 CREDITS 64
Title: Internship and Research Project		
Module Outcomes: At the end of the module students will be able to gain practical experience and skills in their field of IKS specialization; and will be able to write an independent research paper based on the field experience (internship) in their area of specialization.		

MA.2.19 NURSING

Module code: EPPM 111	Semester 1	NQF level: 5 CREDITS 6
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	NQF level: 7 CREDITS 6
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	NQF level: 5 CREDITS 18
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	NQF level: 5 CREDITS 18
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	NQF level: 5 CREDITS 24
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	NQF level: 5 CREDITS 18
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	NQF level: 7 CREDITS 12
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 anaesthesia.		
Module code: GNSM 311	Semester 1	NQF level: 7 CREDITS 12
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	NQF level: 7 CREDITS 18
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 units. 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: MIYM 311	Semester 1	NQF level: 7 CREDITS 24
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: MIYM 322	Semester 1	NQF level: 7 CREDITS 24
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: MIYM 411	Semester 1	NQF level: 8 CREDITS 18
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: MIYM 422	Semester 2	NQF level: 8 CREDITS 18
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	NQF level: 5 CREDITS 18
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	NQF level: 5 CREDITS 18
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 of the basic needs of individuals, families and communities.		
Module code: NCHM 211	Semester 1	NQF level: 6 CREDITS 12
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 ?	NQF level: 7 CREDITS 24
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	NQF level: 7 CREDITS 6
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 322	Semester 1	NQF level: 7 CREDITS 6
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	NQF level: 8 CREDITS 12
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	NQF level: 8
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	NQF level: 5 CREDITS 12
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	NQF level: 7 CREDITS 18
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	NQF level: 7 CREDITS 18
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	NQF level: 8 CREDITS 18
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	NQF level: 8 CREDITS 18
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: SOCL 111	Semester 1	NQF level: 5 CREDITS 12
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: SOCL 121	Semester 2	NQF level: 5 CREDITS 12
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	NQF level: 5 CREDITS 12
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	NQF level: 6 CREDITS 12
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	NQF level: 6 CREDITS 12
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	NQF level: 5 CREDITS 12
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	NQF level: 5 CREDITS 12
Title: Anatomy and 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	NQF level: 5
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	NQF level: 5 CREDITS 12
Title: Physiology & Biochemistry		
Module outcomes:		
Describe the physiology of the tissues and organs of nervous, urinary, reproductive and endocrine systems 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.		

2.22 PHYSICS

Module code: SFPM 171	Year1 (Foundation)	NQF LEVEL 5 CREDITS 12
Title: Introduction to mechanics and heat		
Module outcomes:		
After successful completion of the module students will be able to write the mathematical expressions of concepts like force, work, momentum and simple harmonic motion in mechanics, and heat transfer; students should have intellectual skills and strategies needed for solving problems in these areas.		
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: SFPM 172	Year 2 (Foundation)	NQF LEVEL 5 CREDITS 12
Title: Basic electromagnetism and modern physics		
Module outcomes:		
Upon completion of the module students should be able to state the laws, definitions and principles of electricity and modern physics, be able to perform a variety of experiments in electricity and make conclusions from the results obtained.		
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 successfull, compute the result and be able to present the results graphically.		
Module code: PHYM 118	Semester 1	NQF LEVEL 5 CREDITS 12
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 extend 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****NQF LEVEL 5 CREDITS 12****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 successfull, compute the result and be able to present the results graphically.

Module code: PHYM 129**Semester 2****NQF LEVEL 5 CREDITS 12****Title: Introduction to Basic Physics Concepts****Module outcomes:****Knowledge:**

At the end of this module students acquire basic mathematical knowledge of the topics covered, meaurment, vectors, linear motion, force and newton's laws, work, energy, power, universal law of gravitation, electricity, magnetism, electromagnetism, power generation. State the laws, definitions and principles of above mentioned 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 calculations. Demonstrate basic knowledge and insight of the above mentioned physical phenomena as they occur in everyday life. Solve problems similar to those they have met in the examples; the problems to be solved are applications of the above mentioned topics related to Agriculture and Animal Science. Demonstrate basic knowledge and insight of the concepts studied in the module content. In practical sessions students perform a variety of experiments successfull, compute the result and be able to present the results in a meaningful way.

Module code: PHYM 215	Semester 1	NQF LEVEL 6 CREDITS 8
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	NQF LEVEL 6 CREDITS 8
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 abovementioned 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	NQF LEVEL 6 CREDITS 8
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

NQF LEVEL 8 CREDITS 8

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

NQF LEVEL 7 CREDITS 8

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

NQF LEVEL 7 CREDITS 8

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

NQF LEVEL 7 CREDITS

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

NQF LEVEL 7 CREDITS 8

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

NQF LEVEL 7 CREDITS 8

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	NQF LEVEL 7 CREDITS 8
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	NQF LEVEL 7 CREDITS 8
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	NQF LEVEL 7 CREDITS 8
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: WVNS211	Semester 1	NQF LEVEL 6	CREDITS 12
Title: Understanding the Natural World			
Module outcomes:			
After completion of this module the student should be able to demonstrate:			
(i) A clear understanding of the fundamental nature of science and reflect on how science tends to differ from other modes of knowing.			
(ii) An understanding and appreciation of the influence of science and technology on the spiritual, cultural and material ideologies of humans as well as the nature and functions of worldviews and their historical development.			
(iii) The interconnectedness of global patterns and processes and how they are affected			

by science and technology; and understand globalization and the interconnectedness of the major drivers of globalization.

Method of delivery: Contact lectures

Assessment modes: test, assignment and a 3 hr end of module examination

Module code: WVNS221	Semester 2	NQF LEVEL 6	CREDITS 12
Title: Understanding the Natural World			

Module outcomes:

After this module has been successfully completed, the student must be able to demonstrate an understanding of the relationships between science, technology and society and their development historically to present days, and an understanding of contemporary discourse on science, technology and society, with special reference to South Africa.

The student must also be able to identify some of the most important ethical issues that are associated with the applications of some technologies and critically react to them from a specific worldview.

The student must be able to form a well thought-out rational standpoint on the concept of sustainable development, including the socio-economic and environmental implications of energy provision.

Method of delivery: Contact lectures

Assessment modes: test, assignment and a 3 hr end of module examination

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