CALENDAR 2012

FACULTY OF AGRICULTURE,
SCIENCE AND TECHNOLOGY
POSTGRADUATE

Mafikeng Campus

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PLEASE MENTION YOUR UNIVERSITY NUMBER IN ALL CORRESPONDENCE.

The General Academic Rules of the University, to which all students have to subject themselves and which apply to all the qualifications offered by the University, appear in a separate publication and are available on the web page at: http://www.nwu.ac.za/jcalendar index_

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.

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FACULTY OF AGRICULTURE, SCIENCE AND TECHNOLOGY (FAST)

Message from the Executive Dean

A warm welcome to our fast growing Faculty of Agriculture, Science and Technology. I would like to thank you for choosing programmes in FAST and assure you that you have made the right choice**.** 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 and the necessary information about the faculty. It is important to acquaint yourselves with the contents of this calendar to ensure that you know what FAST is all about.

FAST is made up of three schools namely;

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

FAST hosts three centres namely;

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

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

VISION

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

VALUES

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

MISSION STATEMENT

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

- We are ***value-driven,*** locally, nationally and internationally recognized as such.
- **educating and training scientists** through **quality teaching** process to meet national needs.
- **producing relevant and focussed research** for the benefit of the province, the country and its people.
- ensuring **implementation of expertise (both profit and non profit**) in the province and the country especially for **poverty alleviation**.
- aspiring to be the **inception of four centers of excellence** in order to be nationally and internationally recognised.
- being **sensitive to (and promoting public awareness of) the environment and the social needs of the province** and the country.
- **recruit and develop staff** who are competent in addressing all the above mentioned

AIMS AND OBJECTIVES

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

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

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

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

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

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

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

OFFICE BEARERS

EXECUTIVE DEAN
M.Davhana-Maselesele (Professor), RN, RM, BA Cur, BA Cur Hons,
Nursing Education, Nursing Administration (UNISA), HRM, PHC (RAU), MA Cur (UNISA),
PhD (RAU).IRENSA (UCT)

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

DIRECTORS OF SCHOOLS / RESEARCH UNITS

Agricultural Sciences (SoAS)
M. Mbewe (Associate Professor), BSc (Texas Southern Univ) PhD (Cambridge)

Mathematical and Physical Sciences (SoMPS)
E.E. Ebenso, BSc (Hons)(Calabar), MSc (Ibadan), PhD (Calabar)

Environmental and Health Sciences (SoEHS)
Dr T Sithebe MSc (University Of Southern Illinois, PhD Virology (Medunsa)

SUBJECT GROUP CHAIRPERSONS

Agricultural Economics & Extension
*Oladele , BSc Agricultural Extension, MSc, PhD(University of Ibadan,Nigeria)

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

Animal Science
*M. M. Qinisa, BSc Agric, BSc Agric Hons (Fort Hare), MSc, PhD (Pretoria)

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

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

Computer Science
*B Nleya, MSc (Tashkent Institute Of Telecommunication and Information Systems)
PhD St Pietersburg Institute Of Telecommunications)

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

Geography And Environmental Sciences
*Prof Kabanda BSc Hons (UK) MSc (UCT) PhD (Univen)

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

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

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

CENTRE MANAGERS

Applied Radiation Science And Technology
M. T. Kambule (Associate Professor), BSc (Unisa), BSc Hons (Unin), MSc (Unisa),
PhD (Massachusetts)

MEMBERS OF EXCO

Executive Dean
M.Davhana-Maselesele (Professor)

Agricultural Sciences (SoAS)
M. Mbewe (Associate Professor)

Mathematical and Physical Sciences (SoMPS)
M. T. Kambule (Associate Professor)

Environmental and Health Sciences (SoEHS)
T. Sithebe (Dr)

Agricultural Economics and Extension
O.I. Oladele (Associate Professor)

Animal Health
B.M. Dzoma (Associate Professor)

Animal Science
M.M. Qinisa (Dr)

Applied Radiation Science And Technology
M.T. Khambule (Associate Professor)

Applied Radiation Science And Technology
V. Tshivhase (Associate Professor)

Biological Sciences
P. W. Malan (Associate Professor)

Biological Sciences
O.O. Babalola (Dr)

Chemistry
D. A. Isabirye (Professor)

Crop Science
M. S. Mokolobate (Lecturer)

Crop Science
S.A. Materechera (Professor)

Crop Science
S. M. Funnah (Professor)

Crop Science
W.D. Gestring (Professor)

Farm Administration
B. D. Gaobepe (Farm Manager)

Geography And Environmental Sciences
T. Kabanda (Associate Professor)

Geography And Environmental Sciences
C. Munyati (Associate Professor)

Mathematical Sciences
C.M. Khalique (Associate Professor)

Mathematical Sciences
J. Moori (Research Professor)

Nursing
R. Phetlhu (Dr)

Nursing
U. Useh (Research Professor)

Physics
K. Dzinavatonga (Lecturer)

Physics
S. H.Taole (Professor)

Physics
T.R. Medupe (Associate Professor)

M.A.1 FACULTY RULES

M.A.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.

M.A.1.2 FACULTY-SPECIFIC RULES

Work Experience

A student studying agriculture shall be required to gain work 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 work experience.

A student studying agriculture shall be required to carry out practical Farm/Laboratory work at various times during semesters.

Examination

In terms of rule A 8.6 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 required for that module.

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.

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.

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.

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.

M.A.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 index_e.html

M.A.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.

M.A.1.5. SCHOOLS OF THE FACULTY

SCHOOL	SUBJECT GROUP
Agricultural Sciences (SoAS)	Agricultural Economics and Extension Animal Science Crop Science Centre for Animal Health Studies (CAHS)
Environmental and Health Sciences (SoEHS)	Biological Sciences Geography and Environmental Sciences Nursing Sciences Centre for Air and Water Research (CAWR)
Mathematical and Physical Sciences (SoMPS)	Chemistry Mathematical Sciences Physics and Electronics Computer Science Centre for Applied Radiation Science and Technology (CARST)

M.A.1.6. QUALIFICATIONS, PROGRAMMES AND CURRICULA

POSTGRADUATE DIPLOMAS				
Qualification	**Programme and code**	**Curriculum and code**	**Method of delivery**	**NQF level**
Postgraduate Diploma	Agric Economics 272 100	N501M	Full-time	7
Postgraduate Diploma	Agric Extension 272 100	N502M	Full-time	7
HONORS DEGREES				
Qualification	**Programme and code**	**Curriculum and code**	**Method of delivery**	**NQF level**
Honors Agric	Animal Health 276 100	N605M	F	8
Honors Agric	Animal Science 276 101	N605M	F	8
Honors Agric	Agric Economics 276 103	N602M	F	8
Honors Agric	Agric Extension 276 104	N603M	F	8
Honors Agric	Crop Science 276 102	N606M	F	8
Honors	Radiation Science 202 145	N609M	F	8
Honors	Applied Mathematics 202 140	N609M	F	8
Honors	Biology 202 141	N610M	F	8
Honors	Microbiology 202 143	N640M	F	8
Honors	Chemistry 202 117	N623M	F	8
Honors	Computer Science 202 142	N612M	F	8
Honors	Electronics 202 146	N613M	F	8
Honors	Land Management 202 112	N601M	F	8
Honors	Mathematics 202 119	N613M	F	8
Honors	Physics 202 144	N616M	F	8
Honors	Geography 202 118	N614M	F	8
Honors	Statistics 202 115	N615M	F	8
MASTERS DEGREES				
Qualification	Programme and code	Curriculum	Method of delivery	NQF level
MSc Agric	Animal Health 277 101	N871M	F/P	9
MSc Agric	Animal Science 277 105	N870M	F/P	9
MSc Agric	Agric Economics 277 103	N873M	F/P	9
MSc Agric	Agric Extension 277 104	N874M	F/P	9
MSc Agric	Crop Science 277 102	N873M	F/P	9
MSc	Radiation Science 285 100	N881M	F/P	9
MSc	Applied Mathematics by	N830M	F/P	9

	Coursework 203 121			
MSc	Applied Mathematics 203 121	N804M	F/P	9
MSc	Biology 203 122	N804M	F/P	9
MSc	Chemistry 203 123	N805M	F/P	9
MSc	Computer Science 203 180	N808M	F/P	9
MSc	Geography 203 124	N806M	F/P	9
MSc	Geography (Environmental Science) 203 133	N830m	F/P	9
MSc	Mathematics by Course work 203 135	N806M	F/P	9
MSc	Mathematics 203 135	N830M	F/P	9
M Cur	Nursing 833 100	N830M N831M N832M	F/P	9
MSc	Physics 203 136	N807M	F/P	9
PhD				
Qualification	Programme and code	Curriculum	Method of delivery	NQF level
PhD Agric	Animal Health 204 125	N902M	F/P	10
PhD Agric	Animal Science 204 126	N902M	F/P	10
PhD Agric	Agric Economics 204 128	N904M	F/P	10
PhD Agric	Agric Extension 204 129	N905M	F/P	10
PhD Agric	Crop Science 204 127	N903M	F/P	10
PhD	Applied Mathematics 204 123	N934M	F/P	10
PhD	Biology 204119	N930M	F/P	10
PhD	Chemistry 204 120	N931M	F/P	10
PhD	Computer Science 204 132	N936M	F/P	10
PhD	Geography 204 121	N932M	F/P	10
PhD	Environmental Science 204 114	N914M	F/P	10
PhD	Mathematics 204 122	N933M	F/P	10
PhD	Nursing 805 113	N950M	F/P	10
PhD	Physics 204 124	N935M	F/P	10

M.A.1. 7. RULES FOR THE DEGREE BSC

M.A.1.7.1. AGRICULTURE POSTGRADUATE PROGRAMMES

POSTGRADUATE DIPLOMA IN AGRICULTURE IN AGRIC ECONOMICS AND AGRIC EXTENSION MENT

Aim

The aim of the programme is to provide locally trained agricultural and rural development specialists to government ministries and agencies, non-governmental organizations (NGOs), development projects and institutions in the country and other countries in the Southern African sub-region. The students shall be introduced to and be acquainted with methods and principles of appraising and managing agricultural and/or rural development projects/programmes from an economics perspective.

Admission Requirements

A person shall be admitted as a candidate for the Postgraduate Diploma in Agricultural Economics and Management if he or she in possession of a BAgric or B.Sc Agric degree of this university or its equivalent as approved by Senate .

Duration

The Postgraduate Diploma in Agricultural Economics and Management may be awarded to candidates after a period of two semesters of full-time study or four semesters of part-time study.

Programme Requirements

The postgraduate Diploma in Agricultural Economics and Management will be awarded to candidates who have completed 132 credits from the list of modules under 18.5.

M.A.1.7.2 HONOURS PROGRAMMES

M.A.1.7.2.1 HONOURS BACHELOR OF SCIENCE Hons BSc

Objectives

To develop graduates in science who are able to adress the challenges of the country

Admission

A student should normally obtain a assessment mark of at least 60% in the final year of the relevant subject.

Duration

The honours programme shall extend over a minimum period of two semesters and a maximum of four semesters of full-time study.

Examinations

A candidate will receive credit for a module only if he/she obtains at least 50% in the examination.

To obtain a distinction the distinction aggregate prescribed in the general rules must be obtained.

M.A.1.7.2.2.HONOURS BACHELOR OF SCIENCE IN RADIATION SCIENCE AND TECHNOLOGY

Hons BSc in ARST

Purpose

The Honours degree in Applied Radiation Science and Technology is a 120 credits fourth year (BSc+1year) exit level qualification. It focuses on the basic science disciplines generally ascience training. The successful completion of Honours degree is a pre-requisite for entry into a 180 credits Masters degree of ARST.

Admission Requirements

A BSc or its equivalent (as approved by Senate) with majors in two of the following disciplines can apply: Chemistry, Physics, and Mathematics. Other majors with Mathematics on a second year level will also be considered.

Admission may also be gained through the principle of RPL (Recognition of Prior Learning) with proven record of appropriateexpertise, approved by Senate.

Duration

Candidates for the Honours degree in Applied Radiation Science and Technology must be registered for a minimum of two semesters of full time study.

Programme Requirements

The Honours degree will only be awarded if a student passes ALL four modules and the practical training.

Assessment

Assessment of performance will be based on tests, assignments, laboratory experiments, other written or oral presentations and formal examination. The Semester mark and examination mark will be weighted equally in each module.

The candidate who fails a module will be allowed to repeat the module and rewrite the examination once only. If he/she fails the module for the second time, a two year period will be required before he/she can register for the Honours degree again.

M.A.1.7.3 MASTERS PROGRAMMES

M.A.1.7.3.1 MASTER OF SCIENCE IN AGRICULTURE (MSc in AGRIC)

Admission

To be admitted to this qualification the candidate should be in possession of the BSc. Agric Honours degree or an equivalent qualification as approved by Senate.

Duration

A student shall be registered for a minimum of two semesters and a maximum of four semesters of full-time study. For part-time study, the maximum duration is eight semesters.

Proposed Curricula

The qualification is a research based (with the exception of Agric Economics) and research is done under the following major fields of study:

Animal Health

Animal Science

Crop Science

Agricultural Economics

M.A.1.7.3.2. MASTER OF SCIENCE MSc

General

The rules must be read in conjunction with the general academic rules A.13 for Masters degrees.

Objective

To prepare graduates to be able to conduct research and address the needs of the country.

Admission

To be permitted to register for a MSc degree, a candidate should, unless otherwise determined by the Faculty Board, be in possession of an honours degree.

Duration

Candidates for the general MSc degree must be registered for a minimum of two semesters and a maximum of four semesters of full-time study.

Examination

Candidates must submit a full dissertation for examination.

7.A.1.7.3.3PROGRAMME: RESEARCH MASTER'S DEGREE: (DISSERTATION)

LEARNING OUTCOMES

- The qualified student should be able to practise as a leader and independent practitioner together with other multi-disciplinary team members within the health care system.
- As a nursing leader, he/she should be able to practice professional, comprehensive, high-quality, scientifically founded Nursing
- The qualified student should be able to address the needs of the time, within the province and the country.
- The student should be able render care that is congruent to cultural needs and be focused on primary health care approach.
- The advanced nurse should be in continual pursuit of personal and professional growth, as well as facilitating the patient's pursuit of health.

  This programme includes the curricula for Community Nursing, Health Service Management, Health Science Education, Professional Nursing and Nursing.

SPECIFIC ADMISSION REQUIREMENTS

In addition to the general admission requirements (G.29.3), the following hold:

a) A student should supply proof that he/she has already obtained a first bachelor's degree or equivalent qualification[1].

b) If a student wants to practise as a nurse in South Africa, he/she should supply proof of registration as nurse at the South African Council of Nursing at the beginning of every study year.

c) To specialise in any of the nursing programmes/curricula, the student should supply proof of a special registration at the South African Council of Nursing, or of an equivalent registration if the student is not a South

African citizen

d) To be admitted to any of the programmes/curricula, a student should haveobtained at least 60% in the final modules of the specific specialization field in the first B degree. The student is subjected to a selection process during which the director and supervisor of the particular study field/programme are present.

e) The successful completion of Research Methodology (NRM874) and the to the second study year.

Further stipulations:

Community Nursing

A student who wishes to specialise in Community Nursing should have a four year Bachelor's degree in Nursing with Community Nursing as major, or a three-year Bachelor's degree with Community Nursing as major and a diploma in Community Nursing.

Health Service Management

A student who wishes to specialise in Health Service Management should have a four-year Bachelor's degree in Nursing, or a three-year Bachelor's degree in Nursing with Nursing Management as major and a diploma in NursingManagement

Health Science Education

A student who wishes to specialise in Health Science Education should have a four-year Bachelor's degree in Nursing, or a three-year Bachelor's degree in Nursing with Nursing Education as major and a diploma in Nursing.

Professional Nursing

A student who wishes to specialise in Professional Nursing should have a four year or three-year Bachelor's degree in Nursing.

M.A.1.7.4.1.DOCTOR OF PHILOSOPHY PhD

14.1 Admission

See general academic rules A.14 for doctoral degrees.

14.2 Purpose

To develop graduates who will be able to respond to challenges and initiate relevant interventions

14.3 Programme

This is a research degree and the candidate is expected to conduct independent research on a topic approved by the Faculty Academic Board and submit a thesis for examination.

M.A.1.7.4.2.DOCTOR OF PHILOSOPHY IN NURSING

QUALIFICATION: PHILOSOPHIAE DOCTOR (PHD)

PURPOSE

The Doctor of Philosophy in Nursing Science is designed to prepare professional nurses as scholars and researchers who will make a substantive contribution to the body of knowledge for the discipline of nursing and thereby improve health services for those who receive nursing care

INTENDED OUTCOMES

1. Generate new knowledge through research and testing of theory;
2. Examine the trends and factors that influence the generation of knowledge and its use in health care;
3. Contribute to solutions that advance health care in a culturally diverse society through communication of knowledge to the scientific community;
4. Reflect a nursing and interdisciplinary perspective in research and scholarly endeavors.

ADMISSION REQUIREMENT

1. Students who complete their Masters degrees will be able to register for a Doctoral programme.
2. Students must have obtained 60% and above to access the programme.
3. The students must defend the proposal during doctoral seminar before registration.

4. Students must before registration of each study year submit proof of registration with SANC.

SPECIAL FIELDS

1. Community Health Nursing
2. Health Service Management
3. Nursing Education
4. Psychiatric Nursing

DURATION

Minimum duration of three years

M.A.1.7.5 LIST OF MODULES

Module code	Descriptive name	Prerequisites	Credits
AGRIC ECONOMICS			
ECOM 521	Agric Project Appraisal		18
ECOM 523	Rural Community Development		18
ECOM 514	Agric and Economic Development		18
ECON 221	Microeconomics		12
ECOM 522	Res Meth & Data Anal		18
ECOM 421	Agric Policy		12
ECOM 524	Seminar Paper		18
ECOM 611	Agric Business Management		18
ECO M612	Agric Organization and Administration		18
ECOM 613	Land Resource Economics.		18
ECOM 614	Agric Finance Management		18
ECOM 615	Introduction to Linear Programming		18
ECOM 621	Food Security and Policy Analysis		18
ECOM 622	Introduction to Econometrics		18
ECOM 623	Research Project		18
ECOM 871	Research Project	Hons	240
ECOM 971	Research Project	ECOM 871	360
AGRIC EXTENSION			
EXTM 511	Essential Agric Extension		18
EXT M512	Elements of Communication in Extension		18
ECOM 513	Rural Community Development		18
ECOM 521	Agric Project Appraisal		18
EXTM 521	Change in Agriculture		18
EXTM 523	Leadership Development in Extension		18
EXTM 524	Seminar Project		18
EXTM 611	Agric Extension Analysis		18
EXT M612	Issues in Agric Development		18

EXTM 621	Programme Planning and Evaluation in Extension		18
EXTM 613	Res Meth in Extension		18
EXTM 614	Farm System Analysis		18
EXTM 622	Com Agric Techn Trans		18
EXTM 623	Human Resource Development		18
EXTM 871	Research Project		240
EXTM 971	Research Project		360
AINMAL HEALTH			
AHAM 611	Diseases I		12
AHAM 612	Adv App Vet Science 1		12
AHAM 613	Research Methodology		6
AHAM 614	Vet External Parasites		12
AHAM 615	Research Project I		6
AHAM 621	Veterinary Immunology		12
AHAM 622	Vet internal parasites		18
AHAM 623	Adv App Vet Science 11		12
AHAM 624	Diseases II		12
AHAM 625	Research Project II		18
AHAM 871	Research Project II	Hons	240
AHAM 971	Research Project II	AHAM 871	360
ANIMAL SCIENCE			
ASCM 612	Pasture management		12
ASCM 613	Pop & quantitative Genetics		12
ASCM 614	Ruminant prod. Science		12
ASCM 615	Feed evaluation& Feeding practices		12
ASCM 616	Research project		24
ASCM 621	Rangeland (Veld) management		12
ASCM 623	Advanced Livestock breeding		12
ASCM 624	Monosgastric Animal Production		12
ASCM 625	Digestive physiology		12
FSCM 611	Agricultural Stattistics		12
ASCM 626	Research project		24
ASCM 871	Masters Dissertation	Hons	240
ASCM 971	PhD Thesis	ASCM 871	360
CROP SCIENCE			
PCPM 611	Selected Topics in Crop Science/Research Project		24
PCPM 612	Applied Crop Physiology		12
PCPM 613	Crop Protection		12
PCPM 614	Agro-Meteology		12
PSRM 613	Land and Water Management		12

PSRM 612	Soil Microbiology		12
PSRM 622	Soil Classification & Land Use Planning		12
PCPM 621	Crop Production System		12
PCPM 624	Advanced Plant Breeding		12
PCPM 623	Horticultural Science		12
PSRM 623	Irrigation Management		12
PCPM 622	Soil Plant Water Relations		12
PCPM 625	Selected Topics in Crop Sci./Research Project		24
PCPM 871	Masters Dissertation	Hons	240
PCPM 971	PhD Thesis	PCPM 871	360
APPLIED RADIATION SCIENCE			
ARSM 611	Nuclear Physics	None	24
ARSM 612	Nuclear Chemistry	None	24
ARS 613	Laboratory Practicals	None	16
MARS 621	Radiation and Environment	None	24
MARS 622	Radioactive Waste Minimisation and Management	None	24
ARSM 623	Laboratory Practicals	None	16
MARS 873	Research project	Hons	120
APPLIED MATHS			
APMM 616	Symmetries of Differential equations		18
MAYM 612	Theory of Differential Equations		18
APMM 624	Industrial Mathematics		30
APMM 625	Research Project		18
APMM 611	Algebra,Real and Complex Analysis MAYM 311, MAYM 321, MAYM 322		18
APMM 612	Theory of Dynamical Systems		18
APMM 614	Optimal Control Theory		18
APMM 621	Differential Geometry		18
APMM 623	Calculus of variations		18
APMM 622	Capita Selecta		18
APMM 613	Numerical Analysis		18
APMM615	Symmetry and Finance		18
APMM 811	Capita Selecta		30
APMM 812	Capita Selecta		30
APMM 821	Capita Selecta		30
APMM 822	Capita Selcta		30
APMM 871	Masters Dissertation	Hons	240
APMM 971	PhD Thesis	APMM 871	360
BIOLOGY			
CNRM 615	Conservation of Natural Resources		24
PTSM 618	Higher Plant Taxonomy and Systematics		24

CNRM 625	Further Conservation of Natural Resources		24
PTSM 628	Further Higher Plant Taxonomy and Systematics		24
BMCM 622	Environmental and Industrial Microbiology		24
ENTM 616	Applied Entomology		24
PARM 617	Parasitology		24
BEHM 622	Further Animal Behavriour		24
PARM 627	Ecological Parasitology		24
RESM 671	Postgraduate Honours Project		24
BMCM 613	Bacteriology		24
BMCM 614	Virology and Immunology		24
BMCM 621	Mycology		24
BMCM 622	Environmental and Industrial Microbiology		24
BIYM 871	Research Project		240
BIYM 971	Research Project		360
CHEMISTRY			
MCHE 611	Physical Chemistry-I		12
MCHE 612	Inorganic Chemistry-I		12
MCHE 613	Organic Chemistry-I		12
MCHE 614	Analytical Chemistry-I		12
MCHE 625	Physical Chemistry-II		12
MCHE 626	Inorganic Chemistry-II		12
MCHE 627	Organic Chemistry-II		12
MCHE 628	Analytical Chemistry-II		12
MCHE 671	Research Project		36
MCHE 871	Research Project		240
MCHE 971	Research Project		360
COMPUTER SCIENCE			
CISM 611	Alogrithms and Data Structures		24
CISM 612	programming Languages and Objects		24
CISM 613	Operating Systems		24
CISM 624	Networks		24
CISM 625	Databases		24
CISM 626	Artificial Intelligence		2
CISM 671	Research: Project		42
CISM 871	Research: Project	Hons	240
ELECTRONICS			
ELYM 611	MicroprocessorSystems Design		18
ELYM 612	Signals and Systems		18
ELYM 613	Electronic Instrumentation		18
ELYM 624	Computational Methods		18
ELYM 625	Embedded Controllers		18

ELYM 626	Electromagnetics		18
ELYM 671	Project		30
GEOGRAPHY			**24**
GEOM 611	Geography, ideas and methods		24
GEOM 612	Selected fields in human Geography		24
GEOM 613	Technical issues in Geographic Information systems		24
GEOM 614	Environmental problems and management in Africa		24
GEOM 621	Techniques and methods in Geography		24
GEOM 622	Selected fields in Physical Geography		24
GEOM 623	Applications in Geographic Information Systems		24
GEOM 624	Rural Geography		24
GEOM 671	Research Project		24
GEOM 871	Research Project		240
GEOM 971	Research Project		360
ENVIRONMENTAL SCIENCE			
ENVM 871	Research		240
ENVM 971	Research		360
MATHEMATICS			
MAYM 611	Topics in Group Theory		18
MAYM 613	Advanced real Analysis		18
MAYM 625	Research Project		30
MAYM 614	Topology		18
MAYM 612	Theory Of Differential Equations		18
MAYM 621	Functional Analysis		18
MAYM 615	Capita Selecta		18
MAYM 622	Capita Selecta		18
MAYM 623	Capita Selecta		18
MAYM 624	Capita selecta		18
MAYM 811	Capita Selecta		30
MAYM 812	Capita Selecta		30
MAYM 821	Capita selecta		30
MAYM 822	Capita Selecta		30
MAYM 871	Research Project		240
MAYM 971	Research Project		360
NURSING			
NURM 872	Community Science		152
NURM 874	Research Methodology		32
NURM 971	Thesis		360

PHYSICS			
PHYM 611	Statistical Mechanics		12
PHYM 612	Quantum Mechanics		18
PHYM 613	Classical Mechanics		18
PHYM 614	Electromagnetism		18
PHYM 615	Nuclear Physics		12
PHYM 626	Solid State Physics		12
PHYM 627	Computational Physics		24
PHYM 628	Project or Prescribed Experiments		24
PHYM 629	Astrophysics		12
PHYM 971	Master Dissertation		240
PHYM 971	PHD THESIS		360
STATISTICS			
STFM 611	Schochastic Models		15
STFM 612	Advanced Probability Theory		15
STFM 613	Multivariate Analysis		15
STFM 614	Statistical Quality Control		15
STFM 615	Decision Theory		15
STFM 616	Applied Regression Analysis		15
STFM 621	Design Of Experiments and Samp		15
STFM 671	Research Projects		30

M.A.1.7.6 **Compilation of curriculum**

1. POSTGRADUATE DIPLOMA PROGRAMMES

PROGRAMME: PGD AGRICULTURAL ECONOMICS 272 100

Curriculum:PGD AGRICULTURAL ECONOMICS – N501M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
ECON 211	16	ECON 221	16
ECON 212	16	ECON 222	16
		ECOM 522	18
		ECOM 521	18
		ECOM 523	18
ECOM 514	12	ECOM 524	18
		Total	140

PROGRAMME: PGD AGRICULTURAL EXTENSION 272 101

Curriculum: PGD AGRICULTURAL EXTENSION –N502M

Year level 1		Year level 1	
First semester		Second semester	
Module code	**Cr**	**Module code**	**Cr**
EXTM 511	18	EXTM 521	18
EXT M512	18	EXTM 523	18
ECOM 513	18	EXTM 524	18
ECOM 521	18		
Total 1st semester	**72**	**Total 2nd semester**	54
		TOTAL	126

2. HONOURS PROGRAMMES

PROGRAMME: HONOURS BSc AGRICULTURAL ECONOMICS 276 103

Curriculum: HONOURS BSc AGRICULTURAL ECONOMICS – N602M

Year level 1		Year level 1	
First semester		Second semester	
Module code	**Cr**	**Module code**	**Cr**
ECOM 611	18	ECOM 621	18
ECO M612	18	ECOM 622	18
ECOM 613	18	ECOM 623	18
ECOM 614	18		
ECOM 615	18		
Total 1st semester	**90**	**Total 2nd semester**	54
		TOTAL	144

PROGRAMME: HONOURS AGRICULTURAL EXTENSION 276 104

Curriculum: HONOURS AGRICULTURAL EXTENSION – N603M

Year level 1		Year level 1	
First semester		Second semester	
Module code	**Cr**	**Module code**	**Cr**
EXTM 611	18	EXTM 614	18
EXT M612	18	EXTM 622	18
EXTM 621	18	EXTM 623	18
EXTM 613	18	EXTM 624	18
Total 1st semester	**72**	**Total 2nd semester**	72
		Total	144

PROGRAMME: HONOURS BSc Animal Health 276 100

Curriculum: HONOURS BSc Animal Health N605M

Year level 1		Year level 1	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
AHAM 611	12	AHAM 621	12
AHAM 612	12	AHAM 622	18
AHAM 613	6	AHAM 623	12
AHAM 614	12	AHAM 624	12
AHAM 615	6	AHAM 625	18
Total 1st semester	**48**	**Total 2nd semester**	**72**
		TOTAL	**120**

PROGRAMME: HONOURS AGRICULTURE ANIMAL SCIENCE 276 101

Curriculum: HONOURS AGRICULTURE ANIMAL SCIENCE N605M

Year level 1		Year level 1	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
Semester I: Compulsory		Semester II: Compulsory	
ASCM 616	24	ASCM 626	24
Electives depends on the area of specialisation		Electives depends on the area of specialisation	
FSCM 611	12	ASCM 621	12
ASCM 612		ASCM 622	12
ASCM 613	12	ASCM 623	12
ASCM 614	12	ASCM 624	12
ASCM 615	12	ASCM 625	12
		TOTAL	**120**

PROGRAMME: HONOURS AGRICULTURE ANIMAL SCIENCE 276 101

Curriculum: HONOURS AGRICULTURE ANIMAL SCIENCE N660M Pasture Science

Year level 1		Year level 1	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
Semester I: Compulsory		Semester II: Compulsory	
ASCM 612	12	ASCM 621	12
FSCM 611	12	ASCM 626	24
ASCM 616	24		
Any one of the following		Any two of the	

elective		following elective	
ASCM 613	12	ASCM 623	12
ASCM 614	12	ASCM 624	12
ASCM 615	12	ASCM 625	12
		TOTAL	**120**

PROGRAMME: HONOURS AGRICULTURE ANIMAL SCIENCE 276 101

Curriculum: HONOURS AGRICULTURE ANIMAL SCIENCE N661M ANIMAL BREEDING AND GENETICS

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
Semester I: Compulsory		Semester : Compulsory	
ASCM 613	12	ASCM 623	12
FSCM 611	12	ASCM 626	24
ASCM 616	24		
Any one of the following elective		Any two of the following elective	
ASCM 612	12	ASCM 621	12
ASCM 614	12	ASCM 624	12
ASCM 615	12	ASCM 625	12
		TOTAL	120

PROGRAMME: HONOURS AGRICULTURE ANIMAL SCIENCE 276 101

Curriculum: HONOURS AGRICULTURE ANIMAL SCIENCE N662M ANIMAL PRODUCTION

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
Semester I: Compulsory		Semester II: Compulsory	
ASCM 614	12	ASCM 624	12
FSCM 611	12	ASCM 626	24
ASCM 616	24		
Any one of the following elective		Any two of the following elective	
ASCM 612	12	ASCM 621	12
ASCM 613	12	ASCM 623	12
ASCM 615	12	ASCM 625	12
		TOTAL	120

PROGRAMME: HONOURS AGRICULTURE ANIMAL SCIENCE 276 101

Curriculum: HONOURS AGRICULTURE ANIMAL SCIENCE N663M ANIMAL NUTRITION

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
Semester I: Compulsory		ASCM 625	12
ASCM 615	12	ASCM 626	24
FSCM 611	12		12
ASCM 616	24	Any two of the following elective	
Any one of the following elective		ASCM 621	
ASCM 612	12	ASCM 623	12
ASCM 613	12	ASCM 624	12
ASCM 614	12		
		TOTAL	120

PROGRAMME: HONOURS AGRICULTURE CROP SCIENCE 276 102

Curriculum: HONOURS AGRICULTURE CROP SCIENCE N606M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
COMPULSORY		COMPULSORY	
FSCM 611	12	PCPM 625	24
ELECTIVES			
PCPM 611	24	EXTM 622	18
PCPM 612	12	PCPM 621	12
PCPM 613	12	PCPM 624	12
PCPM 614	12	PCPM 623	12
PSRM 612	12	PSRM 623	12
PSRM 613	12	PCPM 622	12
PSRM 622	12		
		TOTAL	**120**

PROGRAMME: HONOURS LAND MANAGEMENT 202 112

Curriculum: HONOURS LAND MANAGEMENT N601M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
COMPULSORY		COMPULSORY	
PSRM 613	12	PSRM 614	12
ECOM 613	18	PSRM 621	24
PSRM 611 GEOM 671	24	ELECTIVE	
		GEOM 623	24
ELECTIVES	12	GEOM 621	24
GEOM 613	24	GEOM 624	24
GEOM 614	24		
		TOTAL	**120**

PROGRAMME: HONOURS APPLIED RADIATION SCIENCE 202 145

Curriculum: HONOURS APPLIED RADIATION SCIENCE N609M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
ARSM 611	24	MARS 621	24
ARSM 612	24	MARS 622	24
ARSM 613	16	ARSM 623	16
Total 1st semester	**64**	**Total 2nd semester**	**64**
		TOTAL	**128**

PROGRAMME: HONOURS BIOLOGY 202 141

Curriculum: HONOURS BIOLOGY N610M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
CNRM 615	24	CNRM 625	24
PTSM 618	24	PTSM 628	24
		RESM 671	24
Total 1st semester		**Total 2nd semester**	
		TOTAL	120

PROGRAMME: HONOURS BIOLOGY 202 141

Curriculum: HONOURS BIOLOGY N664M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
BMCM 622	24	BEHM 622	24
ENTM 616	24	PARM 627	24
PARM 617	24	RESM 671	24
Total 1st semester	**48**	**Total 2nd semester**	**72**
		TOTAL	120

PROGRAMME: HONOURS MICROBIOLOGY 202 143

Curriculum: HONOURS MICROBIOLOGY N640M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
BMCM 613	24	RESM 671	24
BMCM 614	24	BMCM 621	24
		BMCM 622	24
Total 1st semester	**48**	**Total 2nd semester**	**72**
		TOTAL	120

PROGRAMME: HONOURS CHEMISTRY 202 117

Curriculum: HONOURS CHEMISTRY N623M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
MCHE 611	12	MCHE 625	12
MCHE 612	12	MCHE 626	12
MCHE 613	12	MCHE 627	12
MCHE 614	12	MCHE 628	12
		MCHE 671	**36**
Total 1st semester	**48**	**Total 2nd semester**	**72**
		TOTAL	132

PROGRAMME: HONOURS COMPUTER SCIENCE 202 142

Curriculum: HONOURS ELECTRONICS N612M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
COMPULSORY			
CISM 671	24	CISM 671	24
ELECTIVES		ELECTIVES	
CISM 611	24	CISM 624	24
CISM 612	24	CISM 625	24
CISM 613	24	CISM 626	24
Total 1st semester	**60**	**Total 2nd semester**	**60**
		TOTAL	120

PROGRAMME: HONOURS ELECTRONICS 202 146

Curriculum: HONOURS ELECTRONICS N613M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
ELYM 611	18	ELYM 624	18
ELYM 612	18	ELYM 625	18
ELYM 613	18	ELYM 626	18
		ELYM 671	30
Total 1st semester	**54**	**Total 2nd semester**	**84**
		TOTAL	138

PROGRAMME: HONOURS GEOGRAPHY 202 118

Curriculum: HONOURS GEOGRAPHY N614M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
		COMPULSORY	
		GEOM 671	24
ELECTIVES		ELECTIVES	
GEOM 611	24	GEOM 621	24
GEOM 612	24	GEOM 622	24
GEOM 613	24	GEOM 623	24
GEOM 614	24	GEOM 624	24
Total 1st semester		**Total 2nd semester**	
		TOTAL	120

PROGRAMME: HONOURS APPLIED MATHEMATICS 202 140

Curriculum: HONOURS APPLIED MATHEMATICS N609M

Year level 1		Year level 1	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
COMPULSORY		COMPULSORY	
APMM 616	18	APMM 625	30
MAYM612	18		
ELECTIVES		ELECTIVES	
APMM 612	18	APMM 621	18
APMM 613	18	APMM 623	18
APMM 614	18	APMM625	18
APMM 615	18	APMM 622	18
APMM 611	18		
Total 1st semester		**Total 2nd semester**	
		TOTAL	120

PROGRAMME: HONOURS MATHEMATICS 202 119

Curriculum: HONOURS MATHEMATICS N628M

Year level 1		Year level 1	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
COMPULSORY		COMPULSORY	
MAYM 611	18	MAYM 625	30
MAYM 613	18		
ELECTIVES		ELECTIVES	
MAYM 614	18	MAYM 621	18
MAYM612	18	MAYM 622	18
MAYM615	18	MAYM 623	18
	18	MAYM 624	18
Total 1st semester		**Total 2nd semester**	
		TOTAL	120

PROGRAMME: HONOURS PHYSICS 202 144

Curriculum: HONOURS PHYSICS N616M

Year level 1		Year level 1	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
COMPULSORY		COMPULSORY	
PHYM 612	18	PHYM 627	24
PHYM 613	18	PHYM 628	24
PHYM 614	18	ELECTIVES	
ELECTIVES		PHYM 626	12
PHYM 611	12	PHYM624	12
PHYM 615	12		
Total 1st semester		**Total 2nd semester**	
		TOTAL	120

PROGRAMME: HONOURS STATISTICS 202 115

Curriculum: HONOURS APPLIED STATISTICS N615M

Year level 1		Year level 1	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
STFM 611	15	STFM 621	15
STFM 612	15	STFM 671	30
STFM 613	15		
STFM 614	15		
STFM 615	15		
STFM 616	15		45
Total 1st semester	**90**	**Total 2nd semester**	
		TOTAL	135

3. MASTERS PROGRAMMES

PROGRAMME: MSc AGRICULTURAL ECONOMICS 277 103

Curriculum: MSc AGRICULTURAL ECONOMICS - N 873M

Year level 1		Year level 1	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
ECOM 871	240	ECOM 871	240
		Total for the year	**240**

PROGRAMME: MSc AGRICULTURAL EXTENSION 277 104

Curriculum: MSc AGRICULTURAL EXTENSION - N 874M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
EXTM 871	240	EXTM 871	240
		Total for the year	240

PROGRAMME: MSc AGRICULTURURE ANIMAL HEALTH 277 101

Curriculum: MSc AGRICULTURURE ANIMAL HEALTH N871M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
AHAM 871	240	AHAM 871	240
		Total for the year	240

PROGRAMME: MSc AGRICULTURE ANIMAL SCIENCE 277 105

Curriculum: MSc AGRICULTURE ANIMAL SCIENCE N870M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
ASCM 871	240	ASCM 871	240
		Total for the year	240

PROGRAMME: MSc AGRICULTURE CROP SCIENCE 277 102

Curriculum: MSc AGRICULTURE CROP SCIENCE N 872M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
PCPM 871	240	PCPM 871	240
		Total for the year	240

PROGRAMME: MSc BIOLOGY 203 122

Curriculum: MSc BIOLOGY N804M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
BIYM 871	240	BIYM 871	240
		Total for the year	240

PROGRAMME: MSc CHEMISTRY 203 123

Curriculum: MSc CHEMISTRY N805M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
MCHE 871	240	MCHE 871	240
		Total for the year	**240**

PROGRAMME: MSc APPLIED RADIATION SCIENCE 285 100

Curriculum: MSc APPLIED RADIATION SCIENCE N881M

ONE SEMESTER ADVANCED COURSE WORK MODULES

Year level 1	
First semester	
Module code	Cr
MARS 811	12
MARS 812	12
MARS 813	12
MARS 814	12
MARS 815	12
Total 1st semester	**60**

RESEARCH MODULE (One to one and half years)

Module code	Cr	Module code	Cr
MARS 873	120	MARS 873	120
		Total for the year	**120**

1ROGRAMME: MSc COMPUTER SCIENCE 203 180

Curriculum: MSc COMPUTER SCIENC N808M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
CISM 871	240	CISM 871	240
		Total for the year	**240**

PROGRAMME: MSc GEOGRAPHY 203 124

Curriculum: MSc GEOGRAPHY N806M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
GEOM 871	240	GEOM 871	240
		Total for the year	**240**

PROGRAMME: MSc ENVIRONMENTAL SCIENCE 203 133

Curriculum: MSc ENVIRONMENTAL SCIENCE N830M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
ENVM 871	240	ENVM 871	240
		Total for the year	**240**

PROGRAMME: MSc APPLIED MATHEMATICS 203 121

Curriculum: MSc MATHEMATICS COURSE WORK N803M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
APMM 811	30	APMM 821	30
APMM 812	30	APMM 822	30
Total 1st semester	**60**	**Total 2nd semester**	**60**
		TOTAL	120

PROGRAMME: MSc APPLIED MATHEMATICS 203 121

Curriculum: MSc MATHEMATICS BY RESEARCH N804M

Year level 1		**Year level 1**	
First semester		**Second semester**	
Module code	**Cr**	**Module code**	**Cr**
APMM 871	240	APMM 871	240
		Total for the year	**240**

PROGRAMME: MSc MATHEMATICS 203 135

Curriculum: MSc MATHEMATICS COURSE WORK N806M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
MAYM 811	30	MAYM 821	30
MAYM 812	30	MAYM 822	30
Total 1st semester	**60**	**Total 2nd semester**	**60**
		TOTAL	120

PROGRAMME: MSc MATHEMATICS 203 135

Curriculum: MSc MATHEMATICS BY RESEARCH N830M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
MAYM 871	240	MAYM 871	240
		Total for the year	**240**

PROGRAMME: M CUR. MAGISTER CURATIONIS 833 100

Curriculum: MSc M CUR N830M COMMUNITY NURSING SCIENCE

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
VPGV 872	152	VPGV 872	152
VPKN 874	32	VPKN 874	32
		Total for the year	**184**

PROGRAMME: M CUR 833 100

Curriculum: MSc M CUR N831M HEALTH SERVICE MANAGEMENT

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
VPBV 872	152	VPBV 872	152
VPKN 874	32	VPKN 874	32
		Total for the year	**184**

PROGRAMME: M CUR 833 100

Curriculum: MSc M CUR N832M HEALTH SCIENCES EDUCATION

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
VPOV 872	152	VPOV 872	152
VPKN 874	32	VPKN 874	32
		Total for the year	**184**

PROGRAMME: MSc PHYSICS 203 136

Curriculum: MSc PHYSICS N807

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
PHYM 871	240	PHYM 871	240
		Total for the year	**240**

PROGRAMME: MSc STATISTICS 203 138

Curriculum: MSc STATISTICS N810M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
STFM 871	240	STFM M 871	240
		Total for the year	**240**

4. PhD PROGRAMMES

PROGRAMME: PhD AGRICULTURAL ECONOMICS 204 128

Curriculum: PhD AGRICULTURAL ECONOMICS - N 904M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
ECOM 971	360	ECOM 971	360
		Total for the year	**360**

PROGRAMME: PhD AGRICULTURAL EXTENSION 204 129

Curriculum: PhD AGRICULTURAL EXTENSION – N905M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
EXTM 971	360	EXTM 971	360
		Total for the year	**360**

PROGRAMME: PhD AGRICULTURE ANIMAL HEALTH 204 125

Curriculum: PhD AGRICULTURE ANIMAL HEALTH N901M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
AHAM 971	360	AHAM 971	360
		Total for the year	**360**

PROGRAMME: PhD AGRICULTURE ANIMAL SCIENCE 204 126

Curriculum: PhD AGRICULTURE ANIMAL SCIENCE N902M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
ASCM 971	360	ASCM 971	360
		Total for the year	**360**

PROGRAMME: PhD AGRICULTURE CROP SCIENCE 204 127

Curriculum: PhD AGRICULTURE CROP SCIENCE- N 903M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
PCPM 971	360	PCPM 971	360
		Total for the year	**360**

PROGRAMME: PhD BIOLOGY 204 119

Curriculum: PhD BIOLOGY N930M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
BIYM 971	360	BIYM 971	360
		Total for the year	**360**

PROGRAMME: PhD CHEMISTRY 204 120

Curriculum: PhD CHEMISTRY N931M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
MCHE 971	360	MCHE 971	360
		Total for the year	**360**

PROGRAMME: PhD COMPUTER SCIENCES 204 132

Curriculum: PhD COMPUTER SCIENCES N936M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
CISM 971	360	CISM 971	360
		Total for the year	**360**

PROGRAMME: PhD GEOGRAPHY 204 121

Curriculum: PhD GEOGRAPHY N932M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
GEOM 971	360	GEOM 971	360
		Total for the year	**360**

PROGRAMME: PhD ENVIRONMENTAL SCIENCE 204 114

Curriculum: PhD ENVIRONMENTAL SCIENCE N914M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
ENVM 971	360	ENVM 971	360
		Total for the year	**360**

PROGRAMME: PhD APPLIED MATHEMATICS 204 123

Curriculum: PhD APPLIED MATHEMATICSMATHEMATICS N934M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
APMM 971	360	APMM 971	360
		Total for the year	**360**

PROGRAMME: PhD MATHEMATICS 204 122

Curriculum: PhD MATHEMATICS N933M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
MAYM 971	360	MAYM 971	360
		Total for the year	**360**

PROGRAMME: PhD NURSING 805 113

Curriculum: PhD NURSING N950M COMMUNITY NURSING SCIENCES

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
VPGM 971	360	VPGM 971	360
		Total for the year	**360**

PROGRAMME: PhD NURSING 805 113

Curriculum: PhD NURSING N951M HEALTH SCEINCES MANAGEMENT

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
VPBM 971	360	VPBM 971	360
		Total for the year	**360**

PROGRAMME: PhD NURSING 805 113

Curriculum: PhD NURSING N952M HEALTH SCIENCES EDUCATION

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
VPOM 971	360	VPOM 971	360
		Total for the year	**360**

PROGRAMME: PhD PHYSICS 204 124

Curriculum: PhD PHYSICS N935M

Year level 1		Year level 1	
First semester		Second semester	
Module code	Cr	Module code	Cr
PHYM 971	360	PHYM 971	360
		Total for the year	**360**

M.A..2 MODULE OUTCOMES

MA.2.1 PGD AND HONOURS AGRIC ECONOMICS AND EXTENSION

Module code: ECOM 511	Semester 1	NQF level: 7
Title: Agricultural Economics (Micro economics)		
Module outcomes: To able to demonstrate understanding of different micro-economic theories and models, income and general distribution analysis, conduct economic analysis in agricultural and related enterprises, welfare economic theory, public goods and externalities and advise agricultural stakeholders on micro-economics matters.		

Module code: ECOM 512	Semester 1	NQF level: 7
Title: Agricultural Economics (Macro economics)		
Module outcomes: To able to demonstrate an understanding of different macro-economic theories and models, national income determination, consumption theories and investment, monetary policy, interest rates, unemployment, inflation and government expenditure and taxation.		

Module code: ECOM 513	Semester 1	NQF level: 7
Title: Agricultural Production Economics		
Module outcomes: To able to demonstrate an understanding of the concepts of Factor–Product relationship, factor-factor relationship, Product-Product relationship, returns to scale and elasticities, knowledge of optimal resource use, the concepts of cost minimization, output optimization, profit maximization and efficiency, have knowledge about the frontier production function, and constant elasticity of substitution production function.		

Module code: ECOM 514	Semester 1	NQF level: 7
Title: Agricultural Project Appraisal		
Module outcomes: To able to demonstrate understanding of project analysis and management process, various aspects of agricultural projects cycle, costs and benefits of agricultural projects , plan and manage an agricultural and/or rural development project, and major project management knowledge areas.		

Module code: ECOM 521	Semester 2	NQF level: 7
Title: Research Methoda and data anlysis		
Module outcomes: To able to identify researchable topic in agricultural economics environment, understand agricultural economics research methodologies, have knowledge about literature search, prepare a research proposal and collect data, analyse data and prepare a research report.		

Module code: ECOM 522	Semester 2	NQF level: 7
Title: Rural Community Development		
Module outcomes: To able to demonstrate understanding of community development theories and models, process of community development, farmer support projects and programmes (FSPs), develop a rural development strategy and advise agricultural stakeholders on rural development strategies.		

Module code: ECOM 523	Semester 2	NQF level: 7
Title: Seminar		
Module outcomes: To able to identify researchable topic in agricultural economics environment, understand agricultural economics research methodologies, have presentation skills, prepare a power point of research proposal and present and defend a research proposal.		

Module code: ECOM 611	Semester 1	NQF level: 7
Title: Agricultural Business Management		
Module outcomes: To able to demonstrate an understand the role and assessment of agribusiness, input, production, processing and distribution sectors of agribusiness, human resource management, production, marketing, efficiency and financial aspects of agribusiness, agricultural business institutions and their functions and perform agricultural business tasks.		

Module code: ECOM 612	Semester 1	NQF level: 7
Title: Agricultural Organization and Administration		
Module outcomes: To able to demonstrate understanding of management functions and principles, principles of organization, quality planning and control, analyze organizational capacity planning and scheduling, the integration of operations, know the important agricultural organizations in South Africa and advise agricultural stakeholders on organization development matters.		

Module code: ECOM 613	Semester 1	NQF level: 7
Title:Land Resource Economics		
Module outcomes: To able to demonstrate an understanding of input-output relationship affecting land use , the impact of institutional factors on land use, framework for environmental economic-economic development, property in land use, acquisition and transfer of ownership rights, describe patterns of land and resource use in South Africa and develop a sustainable resource management strategy.		

Module code: ECOM 614	Semester	NQF level: 7
Title: Agricultural Financial Managenent		
Module outcomes: To able to demonstrate an understanding of financial management functions and environment, show insight on the use of the basic sources of capital, identify and quantify financial risks and demonstrate understanding of its relationship with rate of return, demonstrate skills in making sound financial and investment decisions, and the ability to manage working capital efficiently, perform financial management tasks.		

Module code: ECOM 615	Semester	NQF level: 7
Title: Introduction to Linear Programming		
Module outcomes: To able to demonstrate understanding of basic agricultural marketing functions, concepts of marketing channels in the marketing of livestock, grains and vegetables, describe the South African Agricultural marketing structure, demonstrate understanding of the role of different agricultural institutions in marketing and risks management strategies.		

Module code: ECOM 621	Semester 2	NQF level: 7
Title:Food Security and Policy Analysis		
Module outcomes: To able to demonstrate understanding of the internationally acceptable food security defitions and rights, various food entitlements, requirements, nutritional issues and constraints, food security situation in the SADC and the early warning systems, policy formulation process, South African agricultural policy, and mathematically determine and inteprete food security/food insecurity of a community.		

Module code: ECOM 622	Semester 2	NQF level: 7
Title: Introduction to Econometrics		
Module outcomes: To able to demonstrate understanding of data management and statistical analysis, mathematical and statistical processes involved in establishing structural relationship between dependent and independent variables and assumptions thereof, the different economtric models for use under different situations, apply simple econometric model in data analysis in research situation and interpret and present research results.		

Module code: ECOM 623	Semester 2	NQF level: 7
Title:Research Project		
Module outcomes: To able to identify researchable topic in agricultural economics environment, understand agricultural economics research methodologies, have knowledge about literature search, prepare a research proposal and collect data, analyse data and prepare a research report.		

Module code: EXTM 511	Semester 1	NQF level: 7
Title: Essentials of Agricultural Extension		
Module outcomes: To able to demonstrate an understanding of community development theories and models, identify relevant technologies in community development, develop a rural development strategy and give advise agricultural stakeholders on rural development strategies.		

Module code: EXTM 512	Semester 1	NQF level: 7
Title: Elements of Communication in Extension		
Module outcomes: To able to identify and use the elements of communication process, analyse the elements of communication process in extension, use different communication methods in extension, and develop a communication strategy in extension.		

Module code: EXTM 521	Semester 2	NQF level: 7
Title: Change in Agriculture		
Module outcomes: To able to demonstrate an understanding of agricultural and rural development models, demonstrate understanding of the development strategy, identify and develop an agricultural development strategy and identify factors affecting and promoting chande in agriculture.		

Module code: EXTM 523	Semester 2	NQF level: 7
Title: Leadership Development in Extension		
Module outcomes: To able to demonstrate an understanding of leadership principles, identify different leadership types and tasks, give advise to agricultural stakeholders, promote participation in leadership process.		

Module code: EXTM 524	Semester 2	NQF level: 7
Title: Seminar		
Module outcomes: To able to identify a research proposal, formulate researchable topic in agricultural extension environment, understand agricultural extension research methodologies, prepare a power point of research proposal and present and defend a research proposal.		

Module code: EXTM 611	Semester 1	NQF level:8
Title:Agricultural Extension Analysis		
Module outcomes: To able to identify and analyse factors affecting agricutural extension, apply different approaches to agricultural extension, analyse the efficacy of agricultural etxension and develop agricultural and rural development strategy.		

Module code: EXTM 612	Semester 1	NQF level: 8
Title: Issues in Agricultural Extension		
Module outcomes: To able to demonstrate an understanding of the agricultural policy formulation process, analyse the agricultural policy formulation process, interpret agricultural policy and differentiate between policy formulation and execution.		

Module code: EXTM 613	Semester 1	NQF level: 8
Title: Research Methods in Extension		
Module outcomes: To able to demonstrate an understanding of research principle, identify different research types and desings, use different research techniques in preparing a research proposal, collect and analyse data, interpret, report writing and use research results in extension work.		

Module code: EXTM 614	Semester 1	NQF level: 8
Title: Farming System Analysis		
Module outcomes: To able to demonstrate an understanding of farming system approaches, identify and analyse different farming system approaches, develop a farming system strategy and implement a farming system strategy.		

Module code: EXTM 621	Semester 2	NQF level: 8
Title: Programme Planning and Evaluation in Extension		
Module outcomes: To able to demonstrate an understanding of the innovation/technology development and transfer, identify and diferentiate the different charecteristics of techonologies, analyse the role of media and communication process in technology transfer and develop a communication strategy/plan in disseminating technologies.		

Module code: EXTM 622	Semester 2	NQF level: 8
Title: Communication and Agricultural Technology Transfer		
Module outcomes: To able to demonstrate an understanding of the innovation/technology development and transfer, identify and diferentiate the different charecteristics of techonologies, analyse the role of media and communication process in technology transfer and develop a communication strategy/plan in disseminating technologies.		

Module code: EXTM 623	Semester 2	NQF level: 8
Title: Human Resource Development		
Module outcomes: To able to demonstrate an understanding of the principles of human resources development, identify forms and functions of human resource development, perform human resource development tasks and analyse the human resource development strategy.		

Module code: EXTM 624	Semester 2	NQF level: 8
Title: Research Project		
Module outcomes: To able to identify researchable topic in agricultural eextension environment, understand agricultural economics research methodologies, have knowledge about literature search, prepare a research proposal and collect data, analyse data and prepare a research report.		

MA2.2 HONOURS ANIMAL HEALTH

Old code: AHA 712 New code: AHAM 611	Semester 1	NQF level: 8
Title: Diseases I		
Module outcomes: Learners will be able to demonstrate an advanced understanding of the diseases studied in the theory in order to work independently as the assist the veterinarian in the examination, diagnosis and treatment of but not limited to anthrax, brucellosis, clostridium, salmonella, foot and mouth disease, blue tongue, babesia, heartwater, anaplasmosis, aphosphorosis, milkfever, acetonemia and selected toxicities. Describe the relationship between the diseases studied and nutrition. Describe the prevention of the diseases studied. Describe the epidemiological concepts related to the disease studied.		

Old code: AHA 712 New code: AHAM 611	Semester 1	NQF level: 8
Title: Research Methodology		
Module outcomes: Learners will be able to prepare a literature review for a research project, write up on the materials and methods to be used in a research project. Describe the methods statistical analysis that they will use in their research. Prepare a research proposal and prepare a written scientific report on the research work done.		

Old code: AHA742 New code: AHAM 613	Semester 1	NQF level: 8
Title: Veterinary External Parasites		
Module outcomes: Learners will be able to describe the life cycles of the ticks, flies, mosquitoes, fleas, lice, and mites of veterinary importance in large and small stock in Southern Africa. Describe the effect of these parasites on the health of large and small stock. Describe the importance of management in the treatment and management of these parasitic diseases. Describe the effects of climate and other factors effecting these occurrence in large and small stock. Describe those parasitic diseases which are zoonoses. Describe the use of insecticides and other means of control of these parasitic diseases in large and small stock. Identify external parasites found on large and small stock. Carry out table inspection for sheep scab. Prepare dip tanks for dipping of large and small stock, including the calculation of dilution rates and the mixing of the insecticide in the dip tank. Treat external parasites using topical and injectable medication.		

Module code: AHAM 614	Semester 1	NQF level: 8
Title: Molecular Biology 1		
Module outcomes: Basic understanding of Molecular Biology, understanding the basic structure of DNA, understanding the basic structure of RNA, understanding the basic structure of proteins, understanding DNA replication, Understanding the basis of transcription of information from DNA to RNA, Understanding the translation of mRNA, rRNA, tRNA. Understanding the translation of mRNA into protein. GENES:Understanding the concept of a gene, understanding the structure of a gene, understanding the universal code and codons, understanding the relationship between a gene and a protein. The bacterial chromosome / Genome: Understanding the toxins and toxoids as protein encoded by genes in pathogens, understanding antibiotics as produced by microbes and encoded in genes, understanding pathogenicity as encoded by DNA/genes, Understanding features promoting pathogenicity in bacteria.		

Module code: AHAM 615	Credits 18	Semester 1	NQF level 8
Title: Veterinary Community Health I (Dairy Hygiene)			
Module outcomes: **Dairy Hygiene:** Understanding of the anatomy and physiological processes related to milking. Competency in the hygienic harvesting of milk. Competency in mastitic control. Competency in milk processing. Competency in milk testing. **Food Safety:** Understanding of the HACCP and PRP systems. Competency in the safe handling of food. Understanding of the food safety microbiology			

Module code: AHAM 616	Credits 18	Semester 1	NQF level 8
Title: Veterinary Nutrition I			
Module outcomes: Learners will be able to describe the various analytical procedures used in determining the composition of feeds, describe the role of water in nutrition and compare digestion in the ruminant and monogastric animals. Describe terminology related to digestion. Describe nutritional interrelationships. Describe the important mineral deficiencies in South Africa. Describe the important mineral toxicities in South Africa. Describe the use of vitamins and premixes in the diet. Describe the role of protein and amino acids in the nutrition of animals. Describe the use of roughage by the ruminant. Describe the role of nutrition in the prevention of disease.			

Old code: AHA 702 New code: AHAM 618	Credits 12	Semester 1	NQF level 8
Title: Virology And Immunology			
Module outcomes: Learners will be able to define the terms related to the study of viruses and immunity. Describe the kinds and classes of immunity. Describe cellular and humoral immunity. Describe the RNA and DNA viruses. Describe replication. Describe hypersensitivity. Describe the various viral diseases studied.			

Old code: AHA 742 New code: AHAM 619	Credits 6	Semester 1	NQF level 8
Title: Research Project			
Module outcomes: Learners will be able to prepare a research proposal. Prepare a complete literature review.			

Old code: AHA752 New code: AHAM 621	Credits 12	Semester 2	NQF level 8
Title: Veterinary Immunology			
Module outcomes: Learners will be able to describe the immune response. Describe the role of antibodies in the immune response. Describe humoral and cellular immunity. Describe the cell types in immunity. Describe the immunoglobulins. Describe the different types of immunity. Discuss the immunity to bacteria, virus, protozoa, helminths and other disease causing entities. Describe hypersensitivity and complement as they relate to infections. Vaccinate animals in the field. Detect antibodies in the lab using Rose Bengal, CFT and ELISA. In practical sessions learners immunize animals in the field and use various methods of antibody detection in the lab including Rose Bengal, CFT, ELISA.			

Old code: AHA 762 New code: AHAM 623	Credits 18	Semester 2	NQF level 8
Title: Veterinary Internal Parasites			
Module outcomes: Learners will be able to demonstrate an advanced understanding of the life cycles of the nematode, cestode, and trematode parasites of the livestock. Demonstrate an advance understanding of the effect of these parasites on livestock. Demonstrate the interrelationship of management, climate and other factors with these parasitic diseases. Describe the zoonoses which exist among these parasitic diseases. Describe the use of anthelmintics and other mediations in the control of these parasitic diseases. Describe the role of management in the prevention of these diseases. Prepare faecal flotations and identify the ova under the microscope. Treat livestock for internal parasites using a wide range of medications.			

Module code: AHAM 624	Credits 18	Semester 2	NQF leveL 8
Title: Molecular Biology II			
Module outcomes: Students should be able to demonstrate an understanding of the following: the differences in genomic and plasmid DNA, the role of a vector DNA, intergration and a cloning vector, the concept of genetic transfer, the difference between a donor and a recipient, the Conjugation as a method of genetic transfer, the process of transformation, the process of electroporation, transposable elements, selectable markers, plasmid-borne drug resistance markers, gene cloning systems, animal cell transformation techniques, restriction enzymes, gene expression, gene amplification and Electrophoresis.			

Module code: AHAM 625	Credits 18	Semester 2	NQF level 8
Title: Veterinary Community Health Ii (Meat Hygiene)			
Module outcomes: Discuss meat hygiene. Describe the anatomical and physiological processes related to meat science. Discuss the process of the conversion of muscle to meat. Demonstrate competency in the hygienic slaughter of livestock and poultry. Demonstrate competency in the abattoir procedures and hygiene. Discuss Food Safety. Demonstrate an understanding of the HACCP and PRP systems. Demonstrate competency in the safe handling of food. Discuss food safety microbiology.			

Module code: AHAM 626	Credits 18	Semester 2	NQF level 8
Title: Veterinary Nutrition II			
Module outcomes: Learners will be able to describe strategic for feeding animals during drought. Describe some lick formulations. Balance a ration for protein, minerals, etc. Describe feeding strategies for cows milked in communal grazing areas. Describe feeding strategies for beef cows in communal grazing areas. Describe feeding strategies for pigs kept by communal farmers. Describe feeding strategies for chickens kept by communal farmers.			

Old code: AHA 793 New code:AHAM671	Credits 18	Semester 2	NQF level 8
Title: Research Project II			
Module outcomes: Learners will be able to prepare a research proposal. Prepare a complete literature review. Organise a research project. Collect samples for analysis. Analyse the samples in the laboratory. Collate the data. Analyse the data statistically. Present the results in a mini dissertation which will include the literature review, materials and methods,statistically analysis, results and discussion.			

Module code: AHA 712 (PHASED OUT)	Credits 12	Semester 1	NQF level 8
Title: Diseases I			
Module outcomes: Learners will be able to demonstrate an advanced understanding of the diseases studied in the theory in order to work independently as they assist the veterinarian in the examination, diagnosis and treatment of but not limited to anthrax, brucellosis, clostridium, salmonella, necrobacillosis, pasteurella, colibacillosis, corynebacterium, leptospirosis, and diseases related to the exposure of animals to toxic prin ciples. Describe the relationship between nutrition and the diseases studied. Describe the importance of nutrition and the role of nutrition in disease resistance and vaccination efficacy. Describe epidemiological concepts related to the diseases studied.			

Module code: AHA 722 (PHASED OUT)	Credits 12	Semester 1	NQF level 8
Title: Advanced Applied Veterinary Science I			
Module outcomes: Learners will be able to work independently as they assist the veterinarian in the treatment of animals in the inpatient and outpatient clinics. Assist the veterinarian in the treatment of patients in the ambulatory clinic. Assist the veterinarian in preventative medicine on the University farm and in the district. Assist the veterinarian in the surgical treatment of animals. Provide pre and post surgical treatment of animals.			

Module code: AHA 772 (PHASED OUT)	Credits 12	Semester 2	NQF level 8
Title: Advanced Applied Veterinary Science II			
Module outcomes: Learners will be able to work independently as they assist the veterinarian in the treatment of animals in the inpatient and outpatient clinics. Assist the veterinarian in the treatment of patients in the ambulatory clinic. Assist the veterinarian in preventative medicine on the University farm and in the district. Assist the veterinarian in the surgical treatment of animals. Provide pre- and post-surgical treatment of animals.			

Module code: AHA 782 (PHASED OUT)	Credits 12	Semester 2	NQF level 8
Title: Diseases II			
Module outcomes: Learners will be able to demonstrate an advanced understanding of the diseases studied in the theory in order to work independently as they assist the veterinarian in the examination, diagnosis and treatment of but not limited to foot and mouth disease, blue tongue, African swine fever, BMC, IBR, BVD, Rinderpest, Rift Valley Fever, Wesselsbron disease, horsesickness, lumpy skin disease, pox diseases, canine distemper, parvo, rabies, babesia, heartwater, anaplasmosis, and selected non-infectious diseases. Describe the relationship between nutrition and the diseases studied. Describe the importance of nutrition and the role of nutrition in disease resistance and vaccination efficacy. Describe epidemiological concepts related to the diseases studied.			

Module code: AHA 792 (PHASED OUT)	Credits 12	Semester 2	NQF level 8
Title: Internal Parasites Of Wildlife			
Module outcomes: Learners will be able to demonstrate an advanced understanding of the life cycles of the nematode, cestode, and trematode parasites of wildlife. Demonstrate an advance understanding of the effect of these parasites on wildlife. Demonstrate the interrelationship of management, climate and other factors with these parasitic diseases. Describe the role of management in the prevention of these diseases. Prepare faecal flotations and identify the ova under the microscope.			

MA.2.3 HONOURS ANIMAL SCEINCE

Old code: ASC 712 New code: ASCM 612	Credits 12	Semester 1	NQF level 8
Title: Pasture Management			
Module outcomes: Learners will be able to identify pastures types; produce various categories of animals on pastures. Establish and maintain various types of pastures.			

Old code: ASC 722 New code: ASCM 613	Credits 12	Semester 1	NQF level 8
Title: Population And Quantitative Genetics			
Module outcomes: **Theory:** Genetic characteristics of a population; factors that change gene frequencies; quantitative vs qualitative characters; variation; values and measurement of quantitative characters; heritability and repeatability: their measurements and uses in animal breeding; Genotype x environment interaction; inbreeding and relationship; correlated characters. Upon completion of this module learners will be able to apply their knowledge of population and quantitative genetics for the improvement of farm animals. **Practicals:** Estimation of phenotypic and genetic parameters in farm animals.			

Old code: ASC 732 New code: ASCM 614	Credits 12	Semester 1	NQF level 8
Title: Ruminant Production			
Module outcomes: **Theory:** Dairy, beef and small - stock production, study of different production systems, feeding & high-yield ruminants. Production yield (milk, beef, mutton). Improving efficiency. Upon completion of this module learners will be able to advice farmers on the management of dairy and beef cattle and small stock. **Practical:** Management of dairy, beef and small stock.			

Old code: ASC 742 New code: ASCM 615	Credits 12	Semester 1	NQF level 8
Title: Feed Evaluation And Feeding Practices			
Module outcomes: **Theory:** In-depth study on the evaluation of feeds, theoretical aspects and computation of balanced rations for farm animals. Feeding management of ruminants and non-ruminants. Upon completion of this module learners will be able to demonstrate in-depth understanding of nutritional concepts. **Practicals:** Computation of balanced rations for individual animals. Experimental studies on the relationship between nutrient intake and animal production.			

Old code: ASC 752 New code: ASCM 621	Credits 12	Semester 2	NQF level 8
Title: Rangeland (Veld) Management			
Module outcomes: The learners will be able to identify veld types. To produce various categories of animals and rangeland. To conserve and maintain South African velds.			

Old code: ASC 762 New code: ASCM 622	Credits 12	Semester 1	NQF level 8
Title: Conservation And Management Of Wildlife			
Module outcome: **Theory:** Planning facilities. Marketing of game and products. Restoration of environment and assessment of its impacts. **Practicals:** Visits to game reserve to acquaint students with wildlife conservation practices. Students should learn about wildlife nutrition and maintenance of health.			

Old code: ASC 772 New code: ASCM 623	Credits 12	Semester 2	NQF level 8
Title: Advanced Livestock Breeding			
Module outcomes: **Theory:** Principles of quantitative genetics and Matrix algebra; Prediction of breeding value and producing ability from the animal's own records, sib records, progeny records, pedigree records; The selection index procedure: selection index using different sources of information: single records of individual and relatives, using means of records of individual and relatives; Selection for several traits: tandem selection, selection by independent culling levels, correlated response to selection for a single trait, selection for total economic value, restricted selection index; Mating systems: assortative mating, inbreeding, line crossing, line breeding, crossbreeding, grading-up. Upon completion of this module learners will be able to apply their knowledge of animal breeding for livestock improvement. **Practical:** Students will have projects with small stock; visits to breeding farms and research stations.			

Old code: ASC 782 New code: ASCM 624	Credits 12	Semester 2	NQF level 8
Title: Monogastric Animal Production			
Module outcomes: **Theory:** Physiology and nutrition of different production cycles of pigs and poultry, breeding systems for poultry and pigs, production systems. Upon completion of this module learners will be able to advise farmers on the management of poultry and pigs. **Practical:** Management of monogastric animals.			

Old code: ASC 792 New code: ASCM 625	Credits 12	Semester 1	NQF level 8
Title: Digestive Physiology			
Module outcomes: **Theory:** Digestion, fermentation, absorption and metabolism, energy, protein, vitamins and mineral requirements, deficiencies and imbalances for maintenance, growth, pregnancy and lactation. Voluntary feed intake. Upon completion of this module learners will be able to describe the digestion and metabolism of the various feedstuffs and their effects on animals performance. **Practical:** Studies of rumen function.			

Old code: ASC 793 New code: ASCM 616	Credits 12	Semester 1	NQF level 8
Title: Research Project			
Module outcomes: The learners will be able to carry out literature review, write research proposal and start to carry out research experiments. **Practical:** Selection of research project topic by learners in consultation with the supervisor in the relevant field of specialisation. Development of methodology and the initial presentation of the proposal. The learners will start the experimental or fieldwork and data collection.			

Old code: ASC 797 New code: ASCM 626	Credits 12	Semester 1	NQF level 8
Title: Research Project			
Module outcomes: The learners will be able to develop skills associated with scientific experimental design, data analysis, scientific report writing and an opportunity to orally present and defend the results.In practical sessions learners will continue with the research experiment, including the collection of samples, analysis of samples, organization of data, analysis of data statistically, discussion of the results and publication of results in a mini dissertation.			

Old code: FSC 702 New code: FSCM 611	Credits 12	Semester 1	NQF level 8
Title: Agricultural Statistics			
Module outcomes: **Theory:** Principles of experimental design; analysis of variance; CRD, RCB and Latin square designs. Factorial experiments: 2 factors, fixed random and mixed models, rules for expected values of means squares; comparisons among means, factorial experiments, 3 factors, fixed random and mixed models, nested design, multiple linear and curvilinear regression; analysis of covariance, CRD and RCB designs, covariance where the treatment sum of squares is partitioned. Drawing inferences and writing reports from statistical analyses. Upon completion of this module learners will be able to carry out advanced statistical analysis of data on plants and animals.			

MA.2.4 HONOURS CROP SCIENCE

Old code PCP 703 New code PCPM 611	Credits 24	Semester 1	NQF level 8
Title: Selected Topic In Crop Science/Research Project I			
Module outcome: The student will conduct a review of a specific topic in crop science and submit a report based on the chosen topic/research project; A field/laboratory project will be initiated. Upon completion of this module the learner will have the ablity to carry out investigations in areas of specialisation dealing with problems of practical importance, abilty to write a scientific report and ability to present a seminar orally.			

Old code: PCP 713 New code: PCPM 612	Credits 12	Semester 1	NQF level 8
Title: Applied Crop Physiology			
Module outcomes: Effects of environmental factors (temperature, photoperiod, rainfall, etc) on crop growth and development. Adaptation of crop plants to stress factors. Analysis of growth and development. Maximisation of crop yield through optimisation of photosynthetic potential. Photosynthate partitioning in relation to yield, Modification of yield potential by chemical and cultural means. Plant growth regulators in crop production. Physiological role of mineral nutrition. Crop geometry and competition. Upon completion of this module learners will be able to relate environmental factors to crop growth and development; Have an insight into how crops adapt to stress; Analyse crop growth and development; Modify yield potential by chemical and cultural means; Appreciate how crop geometry and competition affect yield; Design simple experiments to demonstrate different agronomic manipulations aimed at modifying crop yield.			

Old code: PCP 723 New code: PCPM 613	Credits 12	Semester 1	NQF level 8
Title: Crop Protection			
Module outcomes: Self-study, class discussion and assignments on special topics in Crop Protection, such as economics of pest control, pest control management; environment aspects of chemical control of pests; cultural practices and suppression of aspects in areas of Entomology, Pathology and Weed Science. Upon completion of this module learners will be able to apply scientific principles in practical crop protection; demonstrate critical and creative thinking in research and development in areas of crop protection.			

Old code: PCP 733 New code: PCPM 614	Credits 12	Semester 1	NQF level 8
Title: Agro-Meteorology			
Module outcomes: **Theory:** Economic significance and importance of weather; Introduction to meteorology: The earth's atmosphere; Atmospheric energy; Atmospheric moisture and precipitation; Atmospheric motion. Global climatic change and variability and its effect on agriculture. Weather patterns over Southern Africa. Drought and management of drought. Frost and frost prevention/avoidance. Use of weather data for scheduling irrigation. Weather effects on pest and disease incidence. Wind and windbreaks. Upon completion of this module Learners will be able to appreciate the importance of weather agriculture; understand the causes of climatic change and its effects on crops; design management strategies to cope with weather hazards such as drought, frost; to collect, collate, analyse and interpret climatological data. **Practical:** Installation, Calibration and maintenance of weather instruments of importance to agriculture. Interpretation of weather charts. Processing and visual representation of climatological data for agricultural purposes. Observation of environmental variables within plant communities and soil surface. Use of weather station instruments. Calibration and use of sensors for soil; leaf and air temperature measurement. Measurement of surface reflectivity and radiation in a canopy			

Old code: PSS 712 New code: PSSM 611	Credits 24	Semester 1	NQF level 8
Title: Research Projects I			
Module outcomes: Ability to prepare and submit project proposals; a critique of literature on a chosen topic, ability to present a seminar. Ability to carry out investigations in areas of specialization dealing with problems of practical importance; ability to write a scientific report; ability to present a seminar orally.			

Old code: PSS 723 New code: PSSM 612	Credits 12	Semester 1	NQF level 8
Title: Soil Microbiology			
Module outcomes: **Theory:** Diversity and classification of organisms in the soil; soil as an environment for organisms; distribution and importance of soil micro-organisms in the soil; important soil biological processes and activities; decomposition and soil organic matter dynamics; nitrogen transformation in the soil; biological nitrogen fixation; phosphorus transformation and mycorrhizal relationships; transformation of metals; bioremediation. Upon completion of this module learner will be able to apply microbiological technology to improve crop production; conversant with the current literature in soil microbiology and its application in practical agriculture; ability to conduct measurements in soil microbiology; learners will be able to apply microbiological technology to improve crop productions; conversant with the current literature in soil microbiology and its application in practical agriculture; ability to conduct measurement in soil microbiology. **Practical:** Laboratory and field exercises to support theory.			

Old code: PSS 714 New code: PSSM 613	Credits 12	Semester 1	NQF level 8
Title: Land And Water Management			
Module outcomes: **Theory:** The major land and water resources of the world and South Africa-extent and distribution; major quality attributes of land and water resources. The major types of land and water resources utilisation and their limitations; land management for soil fertility maintenance; water havesting; land clearing techniques; use of fire in land management; drainage and irrigation, agroforestry; tillage systems for soil and water conservation. Upon completion of this module learners will become aware of the major land and water resources of the world, their utilisation and limitations; learners will be reacquainted with the techniques of land and water management different parts of the world; familiarity with current literature in land and water management. **Practical:** Laboratory and field exercises to support theory, video, slide and film show to illustrate land and water management practices, field visits to sites and institutions to observe land and water management practices.			

Old code: PSS 732 New code: PSSM 622	Credits 12	Semester 1	NQF level 8
Title: Soil Classification And Land Use Planning			
Module outcomes: **Theory** Fundamental concepts of soil classification; soil classification systems: international and South Africa; Land productivity and suitability maps; Land capability classes and their description; Land classification for land use planning; Soil maps and their utilisation in land use planning; Evaluation of suitability of land for arable, livestock and forestry use. Upon completion of this module learners will be familiar with the different systems of classifying soils in South Africa and the world; Ability to interpret and utilise soil maps for land use planning. **Practical** Field and laboratory exercises to support theory.			

Old code: PSS 702 New code: PSSM 621	Credits 24	Semester 2	NQF level 8
Title: Research Projects II (For Land Management)			
Content: Continuation and finalization of Research Project initiated in PSSM 611. Further data collection and compilation, final data analysis, submission of write-up, and oral presentation of entire report.			

Old code: PCP 753 New code: PCPM 621	Credits 12	Semester 2	NQF level 8

Title: Crop Production Systems

Module outcomes:

Theory:

A study of the principles and practices of monoculture and crop rotation under dry land and irrigation. Tillage practice, Multiple Cropping. Assessing yield advantages in multiple cropping. Analysis of yield data from multiple cropping. Upon completion of this module learners will be able to appreciate the advantages and disadvantages of monoculture; design and discuss different crop rotational systems; appreciate the advantages and disadvantages of multiple cropping systems; to analyse and interpret yield data from multiple cropping systems; assess yield advantages in multiple cropping.

Practical:

Appropriate field practicals and/or observations to support theory, Statistical analysis of data from multiple cropping trials.

Old code: PCP 763 New code: PCPM 622	Credits 12	Semester 2	NQF level 8

Title: Soil Plant Water Relations

Module outcomes:

Theory

Concepts of water potential and movement in soil - plant - atmosphere continuum; water and nutrient uptake by plants roots; determining evaporation and use water use efficiency, Water budgets; effects and measurement of water in soil and plants, research techniques in studies on soil plant water relations and their applications. Upon completion of this module. Learners will be able to apply scientific and principals in soil-plant; water relations in the management and production of crops; ability to perform measurements in soil-plant-water relations and interpret the results properly.

Practical

Laboratory and field exercises to support theory.

Old code: PCP 773 New code: PCPM 623	Credits 12	Semester 2	NQF level 8

Title: Horticultural Science

Module outcomes:

Theory:

Economic and nutritional importance of vegetable crops. The environmental effect on vegetable production. Propagation of vegetable crops. Cultural practices of selected vegetable crops, Seed production of vegetable crops. Marketing, storage and processing of vegetable produce. Vegetable production systems. Upon completion of this module learners will be able to conduct and manage research tasks that test the effects of environmental factors on yield; demonstrate the ability to comprehend scientific literature related to the production of vegetables.

Practical:

Field practicals of the aspects covered in the course.

Old code: PSS 753 New code: PSSM 623	Credits 12	Semester 2	NQF level 8

Title: Irrigation Management

Module outcomes:

Theory:

Irrigation planning and design; Management of irrigation water; Control and management of salts in irrigation; Agronomic and socio-economic factors in irrigation management; Evaluating irrigation systems; The water Act and irrigation management; Use of industrial and urban effluent for irrigation; Discussion of selected irrigation problems with special reference to South Africa. Upon completion of this module learners will be familiar with the common irrigation management problems and their possible solutions; Learners will be converted with procedures and techniques for evaluating an existing irrigation scheme.

Practical:

Laboratory and field exercises/visits to support theory, Videos, films, and slides show to support theory. Field visits to irrigation schemes.

Old code: PCP 763 New code: PCPM 624	Credits 12	Semester 2	NQF level 8

Title: Advanced Plant Breeding

Module outcomes:

Theory:

Review of basic concepts of Population and Quantitative Genetics. The Hardy-Weinberg Law and its relationship to selection, migration, mutation and mating systems. Components of phenotypic and genotypic variance, Breeding and selection methods and strategies. Plant breeding and yield stability. Project Management. Upon completion of this module learners will be able to understand and apply the Hardy-Weinberg law; Appreciate the effects of selection, migration, and mutations in populations of crop plants; relate different mating systems to selection response; estimate yield stability parameters.

Practical:

Problems on Hardy-Weinberg Law and components of variance, Estimating stability parameters using data from multi-location trials.

Old code: PCP 793 New code: PCPM 625	Credits 24	Semester 2	NQF level 8
Title: Selected Topic In Crop Science/Research Projects II			
Module outcomes: Ability to carry out investigations in areas of specialisation dealing with problems of practical importance; ability to write a scientific report; ability to present a seminar orally.			

MA.2.5 HONOURS BIOLOGY

Old code: BEH 738 New code: BEHM 611	Credits 24	Semester 1	NQF level 8
Title: Animal Behaviour			
Module outcome: The ability to design, carry out (analyse, talk and write up) small projects on (from observation of) behavioural activities, demonstrate the understanding of selfishness, maximise inclusive fitness, and kin selection. Demonstrate understanding of the concepts and principles of sociobiology.			

Old code: BEH 788 New code: BEHM 622	Credits 24	Semester 2	NQF level 8
Title: Further Animal Behaviour			
Module outcomes: Students should be able to understand territoriality systems of mating, biological clocks.			

Old code: BMC 708 New code: BMCM 613	Credits 24	Semester 1	NQF level 8
Title: Bacteriology			
Module outcomes: The learners will be on completion of the course, able to identify the main bacterial groups.			

Old code: BMC 718 New Code: BMCM 614	Credits 24	Semester 1	NQF level 8
Title: Virology And Immunology			
Module outcomes: At the completion the course, students are expected to demonstrate awareness of the major groups of vertebrate viruses and be able to explain the key concepts andDdescribe current key areas of advance in virology, e.g. AIDS and cancer. Demonstrate capacity for critical scientific analysis of issues in virology and communicate in writing an awareness of concepts and debates in virology.			

Old code: BMC 758 New code: BMCM 621	Credits 24	Semester 2	NQF level 8
Title: Mycology			
Module outcomes: Upon completion of this module learners will have the ability to identify and characterize different forms of fungi. Ability to relate fungal nutrition and metabolism to economic implications. Ability to interpret, evaluate/analyse and apply fungal bio-technological data			

Old code: BMC 768 New code: BMCM 622	Credits 24	Semester 2	NQF level 8
Title: Environmental And Industrial Microbiology			
Module outcomes: The learners will know ways of sampling water and foods for contaminants. The role of the root nodule and possible microbial use on pollution. Micro-organisms and food poisoning. Genetic engineering.			

Old code: CNR 718 New code: BMCM 615	Credits 24	Semester 1	NQF level 8
Title: Conservation Of Natural Resources			
Module outcomes: Ability to apply ecological principles in solving vegetation problems with particular emphasis on deforestation and bush encroachment. Ability to recognise and identify plant communities. Demonstrate the ability to employ modern software in the analyses of vegetation communities. Demonstrate the ability to analyse and interpret ecological information for purposes of conservation and wildlife management.			

Old code: CNR 778 New code: BMCM 625	Credits 24	Semester 2	NQF level 8
Title: Further Conservation Of Natural Resources			
Module outcomes: Upon completion of this module learners will be able to demonstrate the understanding of conservation problems and strategies of various ecosystems.			

Old code: ENT 708 New code: ENTM 616	Credits 24	Semester 1	NQF level 8
Title: Applied Entomology			
Module outcomes: Recognize insect pest-structure, life histories and behaviour. Taxonomy of insect pest-importance in veterinary science, medicine stored product, agriculture and medicine.			

Old code: ENT 758 New code: ENTM 626	Credits 24	Semester 2	NQF level 8
Title: Further Applied Entomology			
Module outcomes: Demonstrate knowledge of beneficial insects and harmful insects. Demonstrate knowledge of pesticides chemistry and toxicity. Demonstrate knowledge of biological method and integrated pest management.			

Old code: PAR 748 New code: PARM 617	Credits 24	Semester 1	NQF level 8
Title: Parasitology			
Module outcomes: Ability to recognise, identify parasites. Ability to recognise life cycle of parasites and diseases, survey the epidemiology of parasites.			

Old code: PAR 798 New code: PARM 627	Credits 24	Semester 2	NQF level 8
Title: Ecological Parasitology			
Module outcomes: To demonstrate the ability in the understanding and interpretation of host-parasite systems and immunology.			

Old code: PTS 728 New code: PTSM 618	Credits 24	Semester 1	NQF level 8
Title: Higher Plant Taxonomy And Systematics			
Module outcomes: To be able to collect and prepare herbarium specimens as an inventory of plant taxa. To be able to identify and classify common plants of the North West Province. To be familiar with the construction and use of keys for the identification of plant taxa. To demonstrate the ability in interpreting bio-diversity and relationships among plants. Ability to collect, analyse and interpret taxonomic data. Ability to interpret the concept of shared derived characteristics to the classification of plant taxa.			

Old code: PTS 778 New code: PTSM 628	Credits 24	Semester 2	NQF level 8
Title: Further Higher Plant Taxonomy And Systematics			
Module outcomes: Ability to collect, present and interpret taxonomic data. To be able to identify and classify common plants of the North West Province. Ability to identify indigenous plants of importance. Ability to analyse and evaluate bio-diversity/plant diversity in relation to conservation and eco-tourism. Ability to apply the concept of shared derived characteristics in the classification of plant taxa.			

Old code: RES 799 New code: RESM 630	Credits 24	Semester 0	NQF level 8
Title: Postgraduate Honours Project			
Module outcomes: Development of self management skills with regard to planning and conducting of a research project. Capacity to plan and design experimental work appropriate to project. Ability to research and interpret literature. Competence to identify and perform particular techniques relevant to the project undertaken. Ability to monitor and evaluate experimental work. Ability to record and examine data, using statistical analysis, or other software facilities, where appropriate. To present results using suitable means, as well as to critically appraise and discuss them where appropriate.			

MA.2.6 HONOURS CHEMISTRY

Old code: CHE 704 New code: MCHE 611	Credits 12	Semester 1	NQF level 8
Title: Physical Chemistry-I			
Module outcomes: Should have an advanced and critical knowledge in the fields of thermodynamics, quantum mechanics, statistical thermodynamics, spectroscopy and macromolecules. Should be able to read and understand scientific literature in these fields.			

Old code: CHE 714 New code: MCHE 612	Credits 12	Semester 1	NQF level 8
Title: Inorganic Chemistry I			
Module outcomes: Calculate styx numbers and deduce structures of boron compounds understand and explain differences and similarities between d and f block elements interpret ligand substitution reactions in terms of S_N1, S_N2 and S_N1CB mechanisms. Understand and explain inner and outer sphere redox mechanisms.			

Old code: CHE 724 New code: MCHE 613	Credits 12	Semester 1	NQF level 8
Title: Organic Chemistry I			
Module outcomes: Proficiency in major methods of carbon-carbon formation, mechanism of carbon-carbon formation. Demonstrate understanding of basic features and examples of organic polymers.			

Old code: CHE 734 New code: MCHE 614	Credits 12	Semester 1	NQF leveL 8
Title: Analytical Chemistry I			
Module outcomes: Ability to select a suitable chromatographic technique for the separation of a given mixture; use a gas and/or liquid chromatograph for quantitations; derive potentiometric and amperometric titration curves; set-up potentiometric and amperometric titration apparatus and to carry out the titrations; perform determinations for atomic and molecular species using a spectrophotometer.			

Old code: CHE 754 New code: MCHE 625	Credits 12	Semester 2	NQF level 8
Title: Physical Chemistry II			
Module outcomes: Should have advanced and critical knowledge in chemical kinetics, electrochemistry and surface chemistry. Should be able to read and understand scientific literature in these fields.			

Old code: CHE 764 New code: MCHE 626	Credits 12	Semester 2	NQF level 8
Title: Inorganic Chemistry II			
Module outcomes: Demonstrate ability to predict lattice defects in solids, describe the structures of solid solutions metal clusters and semiconductors. Predict stability or organometallics using 18 electron rule. Organise the syntheses and reactivity of organometallics by ligand type, prescribe and explain catalysis involving organometallics.			

Old code: CHE 774 New code: MCHE 627	Credits 12	Semester 2	NQF level 8
Title: Organic Chemistry II			
Module outcomes: Demonstrate knowledge of synthetic routes and chemical reactions of heterocyclic, polycyclic aromatic and non aromatic heterocyclic compounds.Ability to evaluate molecular structure using spectroscopic techniques. Knowledge of the Chemistry of natural products e.g. carbohydrates and proteins.			

Old code: CHE 784 New code: MCHE 628	Credits 12	Semester 2	NQF level 8
Title: Analytical Chemistry II			
Module outcomes: Ability to carry out determinations using a voltammograph; use the various voltametric methods for the determination of analytes from minor to trace levels; appreciate the scope of application of thermal and calorimetric methods; perform determinations of biochemical species (for example, enzymes) by kinetic methods; describe the automatic and automated instrumentation that is used in industrial applications.			

Old code: CHE 798 New code: MCHE 629	Credits 24	Semester 2	NQF level 8
Title: Research Project			
Module outcomes: Ability to define simple research problems, conduct research to solve the problems and present the results both orally and as a research report.			

MA.2.7 HONOURS COMPUTER SCIENCE

Old code: CIS 701 New code: CISM 611	Credits 24	Semester	NQF level 8
Title: Algorithms and data structures			
Module outcomes: Technical skills, personal skills and social skills. The following topics will be covered, basic algorithmic analysis, algorithmic strategies, fundamental computing algorithms, distributed algorithms, graphs and trees, fundamental data structures, and recursion, geometric modelling, parallel algorithms, event-driven programming, cryptographic algorithms, fundamental data structures, fundamental programming constructs, automata theory.			

Old code: CIS 702 New code: CISM 612	Credits 24	Semester	NQF level 8
Title: Programming languages and objects			
Module outcomes: Technical skills, personal skills and social skills. The following topics will be covered, overview of programming languages, virtual machines, introduction to language translation, declarations and types, abstraction mechanisms, object oriented programming, functional programming, language translation systems, type systems, programming language semantics, and programming language design.			

Old code: CIS 703 New code: CISM 613	Credits 24	Semester	NQF level 8
Title: Operating Systems			
Module outcomes: Technical skills, personal skills and social skills. Topics to be covered, overview of operating systems, operating systems principles, concurrency, scheduling and dispatch, and memory management, device scheduling, security and protection, file systems, real-time and embedded systems, fault tolerance, system evaluation.			

Old code: CIS 704 New code : CISM 624	Credits 24	Semester	NQF level 8
Title: Networks			
Module outcomes: Technical skills, personal skills and social skills. Topics to be covered, Introduction to net-centric computing, communication and networking, network security, the web as an example of client-server computing, building web applications, and network management, compression and decompression, multimedia data technologies, wireless and mobile computing.			

Old code: CIS 705 New code: CISM 625	Credits 24	Semester	NQF level
Title: Database Systems			
Module outcomes: Technical skills, personal skills and social skills. Information models and systems, database systems, data modelling, relational databases, database query languages, relational database design, transactional processing, distributed databases, physical design, data mining and data warehousing, hypertext and hypermedia, multimedia information and systems, digital libraries.			

Old code: CIS 706 New code: CISM 626	Credits 24	Semester	NQF level 8
Title: Artificial Intelligence			
Module outcomes: Technical skills, personal skills and social skills. The following topics will be covered fundamental issues in intelligent systems, search and constraint satisfaction, knowledge representation and reasoning, advanced search, advanced knowledge representation and reasoning, agents, natural language processing, machine learning and neural networks, AI planning systems and robotics.			

Old code: CIS 799 New code: CISM 671	Credits 24	Semester	NQF level 8
Title: Project			
Module outcomes: Technical skills, personal skills and social skills. The following topics will be covered Foundations of HCI, graphical users interface (GUI) design, GUI design, Software design, software tools and environments, software processes, software requirements and specifications, software validation, software evolution, software projects management, team management, communications skills and elective topics.			

MA.2.8 HONOURS GEOGRAPHY

Old code: GEO 707 New code: GEOM 611	Credits 24	Semester 1 or 2	NQF level 8
Title: Geography, Ideas And Methods			
Module outcomes: Students Will be able to explain and synthesize the main ideas, methods and developments in the field of geography. The following topics will be covered, Geography, development since ancient times to and including 19th and 20th century movements such as the Gaia hypothesis, role of GIS.			

Old code: GEO 717 New code: GEOM 612	Credits 24	Semester 1 or 2	NQF level 8
Title: Selected Fields In Human Geography			
Module outcomes: The learner should acquire sufficient expertise in an area of study to proceed to a master of arts program. The following topics will be covered, Any of the sub-disciplines of human geography, cultural, economic, agricultural, historical, environmental, urban, population, industrial, rural and so on.			

Old code: GEO 727 New code: GEOM 613	Credits 24	Semester 1	NQF level 8
Title: Technical Issues In Geographic Information Systems			
Module outcomes: To understand the GIS theories and technical issues. Topic to be covered; Data collection, inputs and accuracy. Data quality and standards. Creating and maintainingdatabases. GIS visualization products and cartographic communication. Spatial analysis. Project management and GIS implementation			

Old code: GEO 737 New code: GEOM 614	Credits 24	Semester 1 or 2	NQF level 8
Title: Environment Problems And Management In Africa			
Module outcomes: Students will understand the environmental and management problems of Africa as a whole and Southern Africa in particular. The following topics will be covered, environmental problems in Africa and environmental management in South Africa.			

Old code: GEO 757 New code: GEOM 621	Credits 24	Semester 1 or 2	NQF level 8
Title: Techniques And Methods In Geography			
Module outcomes: Students will be able to use techniques to do independent geographic research and they will cover the following topics, Selected field work techniques in human geography. Selected fieldwork techniques in physical in physical geography. Introduction and application of remote sensing. Introduction and application of GIS. Introduction and application of GPS			

Old code: GEO 767 New code: GEOM 622	Credits 24	Semester 1 or 2	NQF level 8
Title: Selected Fields In Physical Geography			
Module outcomes: The learner should acquire sufficient expertise in an area of study to proceed to an MSc and the topics to be covered are any of the sub-disciplines of geomorphology.			

Old code: GEO 787 New code: GEOM 623	Credits 24	Semester 2	NQF level 8
Title: Applications In Geographic Information Systems			
Module outcomes: Students must be able to demonstrate knowledge of the theoretical aspects of managing a GIS, practical project management skills and use of different GIS applications. Databases and data analysis; GIS managemnt and applications . G-bussiness: GIS assets, constraints, risks and strategies, Operational aspects of GIS, New developments in GIS , Software training in ArcGIS.			

Oldcode:GEO797 New code: GEOM 624	Credits 24	Semester 1 or 2	NQF level 8
Title: Rural Geography			
Module outcomes: Students will achieve competency in the critical analysis of changing rural landscapes and production systems. The following topics will be covered, an analysis of the ways in which rural production systems and landscape are changing with particular emphasis on South Africa.			

Old code: GEO 798 New code: GEOM 671	Credits 24	Semester 1 or 2	NQF level 8
Title: Research Project			
Module outcomes: The ability to produce a research report.			

MA.2.9 HONOURS APPLIED MATHEMATICS

Module code :APMM 611	Credits 18	Semesters 1 and 2	NQF level 8
Title: Algebra And Analysis			
Module outcomes: Competence in the understanding of principles of abstract algebra and analysis. Competence in identifying problems, and application of abstract algebra and analysis to solve the problems. Competence in interpreting results and ability to communicate principles of abstract algebra and analysis to relevant stake holders. The following topics will be covered; Theory of sets, equivalence relations, congruences, residue classes, groups, examples, subgroups, Lagrange's theorem, normal subgroups, quotient groups, homomorphisms, isomorphism theorems, Cayley's theorem, introduction to rings, the familiar number system, polynomials and quotient rings. Real analysis: The real number system, limits, continuity, differentiation, Riemann integration, uniform convergence. Complex analysis: Analytic functions, Cauchy's theorem, singularities, Taylor and Laurent series, residues and poles, contour integration, conformal mapping.			

Module code: APMM 621	Credits 18	Semester 1 or 2	NQF level 8
Title: Differential Geometry			
Module outcomes: Competence in the understanding of principles of differential geometry. Competence in identifying problems, and application of differential geometry to solve the problems.Competence in interpreting results and ability to communicate principles of differential geometry to relevant stake holders.			

Module code: APMM 614	Credits 18	Semester 1 or 2	NQF level 8
Title: Optimal Control Theory			
Module outcomes: Competence in the understanding of principles of optimal control theory.Competence in identifying problems, and application of optimal control theory to solve the problems.Competence in interpreting results and ability to communicate principles of optimal control theory to relevant stake holders.			

Module code: APMM 612	Credits 18	Semester 1 or 2	NQF level 8
Title: Theory Of Dynamical Systems			
Module outcomes: Competence in the understanding of principles of dynamical systems. Competence in identifying problems, and application of dynamical systems to solve the problems. Competence in interpreting results and ability to communicate principles of dynamical systems to relevant stake holders.			

Module code: APMM 616	Credits 18	Semester 1	NQF level 8
Title: Symmetries Of Differential Equations			
Module outcomes: Competence in the understanding of principles of symmetries of differential equations. Competence in identifying problems, and application of symmetries of differential equations to solve the problems. Competence in interpreting results and ability to communicate principles of symmetries of differential equations to relevant stake holders.			

Module code: APMM 617	Credits 18	Semester 1 or 2	NQF level 8
Title: Symmetry And Finance			
Module outcomes: Competence in the understanding of fundamental principles of Symmetry and Finance. Competence in identifying problems, and application of Symmetry and Finance. Competence in interpreting results and ability to communicate principles of Symmetry and Finance.			

Module codes: APMM 622, 613, 615 & 624	Credits 18	Semester	NQF level 8
Title: Capita Selecta			
Module outcomes: Competence in the understanding of fundamental principles of the topic. Competence in identifying problems, and application of the topic to solve the problems. Competence in interpreting results and ability to communicate principles of the topic to relevant stake holders.			

Module code: APMM 624	Credits 30	Semester	NQF level 8
Title: Research Project			
Module outcomes: Competence in the understanding of research methods.Competence in identifying problems, and application of research methods to solve the problems. Competence in interpreting and ability to communicate results to relevant stake holders.			

Module code: APMM 626	Credits 18	Semester 1 or 2	NQF level 8
Title: Partial Differential Equations			
Module outcomes: Competence in the understanding of fundamental principles of partial differential equations. Competence in identifying problems, and application of partial differential equations. Competence in interpreting results and ability to communicate principles of partial differential equations.			

Module code: APMM 627	Credits 18	Semester 1 or 2	NQF level 8
Title: Industrial Mathematics			
Module outcomes: Competence in the understanding of fundamental principles of Industrial Mathematics. Competence in identifying problems, and application of Industrial Mathematics. Competence in interpreting results and ability to communicate principles of Industrial Mathematics.			

MA.2.10 MASTERS OF SCIENCE (MSc) IN APPLIED MATHEMATICS

Module code: APMM 811, 812, 821	Credits 30	Semester 1 or 2	NQF level 9
Title: Capita Selecta			
Module outcomes: Competence in the understanding of fundamental principles of the topic. Competence in identifying problems, and application of the topic to solve the problems. Competence in interpreting results and ability to communicate principles of the topic to relevant stake holders.			

Module code: APMM 822	Credits 30	Semester 1 or 2	NQF level 9
Title: Research Project			
Module outcomes: Competence in the understanding of fundamental principles of the topic. Competence in identifying problems, and application of the topic to solve the problems. Competence in interpreting results and ability to communicate principles of the topic to relevant stake holders.			

Module code: APMM 813	Credits 30	Semester 1 or 2	NQF level 9
Title: Symmetry And Conservation Laws			
Module outcomes: Competence in the understanding of fundamental principles of symmetry and conservation laws. Competence in identifying problems and applications of symmetry and conservation laws.Competence in interpreting results and ability to communicate principles of symmetry and conservation laws.			

Module code: APMM 814	Credits 30	Semester 1 or 2	NQF level 9
Title: Second-Order Partial Differential Equations			
Module outcomes: Competence in the understanding of fundamental principles of second-order partial differential equations. Competence in identifying problems, and application of the second-order partial differential equations. Competence in interpreting results and ability to communicate principles of the second-order partial differential equations.			

Module codes: APMM 815	Credits 30	Semester 1 or 2	NQF level 9
Title: Differential Algebra			
Module outcomes: Competence in the understanding of fundamental principles of differential algebra. Competence in identifying problems, and application of differential algebra. Competence in interpreting results and ability to communicate principles of differential algebra.			

Module code: APMM 816	Credits 30	Semester 1 or 2	NQF level 9
Title: Approximate Transformation Groups			
Module outcomes: Competence in the understanding of fundamental principles of the approximate transformation groups. Competence in identifying problems, and application of the approximate transformation groups. Competence in interpreting results and ability to communicate principles of the approximate transformation groups.			

Module code: APMM 823	Credits 30	Semester 1 or 2	NQF level 9
Title: Invariance Principle In Initial Value Problems			
Module outcomes: Competence in the understanding of fundamental principles of invariance principle in initial value problems. Competence in identifying problems, and application of invariance principle in initial value problems. Competence in interpreting results and ability to communicate principles of invariance principle in initial value problems.			

Module code: APMM 824	Credits 30	Semester 1 or 2	NQF level 9
Title: Symmetry Of Fluids			
Module outcomes: Competence in the understanding of fundamental principles of symmetry of fluids. Competence in identifying problems, and application of symmetry of fluids. Competence in interpreting results and ability to communicate principles of symmetry of fluids.			

Module code: APMM 825	Credits 30	Semester 1 or 2	NQF level 9
Title: Group Theoretic Modelling			
Module outcome: Competence in the understanding of fundamental principles of group theoretic modelling. Competence in identifying problems, and application of group theoretic modelling. Competence in interpreting results and ability to communicate principles of group theoretic modelling.			

MA.2.11 HONOURS MATHEMATICS

Module code: MAYM 611	Credits 18	Semester 1 or 2	NQF level 9
Title: Topics In Group Theory			
Module outcomes: Competence in the understanding of fundamental principles of group theory. Competence in identifying problems, and application of group theory to solve the problems. Competence in interpreting results and ability to communicate principles of group theory to relevant stakeholders.			

Module code: MAYM 613	Credits 18	Semester 1 or 2	NQF level 8
Title: Advanced Real Analysis			
Module outcomes: Competence in the understanding of fundamental principles of real analysis. Competence in identifying problems, and application of the fundamental principles of real analysis to solve the problems. Competence in interpreting results and ability to communicate principles of advanced real analysis to relevant stakeholders.			

Module code: MAYM 614	Credits 18	Semester 1 or 2	NQF level 8
Title: Topology			
Module outcomes: Competence in the understanding of fundamental principles of topology. Competence in identifying problems, and application of topology to solve the problems. Competence in interpreting results and ability to communicate principles of topology to relevant stake holders.			

Module code: MAYM 621	Credits 18	Semester 1 or 2	NQF level 8
Title: Functional Analysis I			
Module outcomes: Competence in the understanding of fundamental principles of functional analysis. Competence in identifying problems, and application of functional analysis to solve the problems. Competence in interpreting results and ability to communicate principles of functional analysis to relevant stakeholders.			

Module code: MAYM 612	Credits18	Semester 1 or 2	NQF level 8
Title: Theory Of Differential Equations			
Module outcomes: Competence in the understanding of fundamental principles of theory of differential equations. Competence in identifying problems, and application of theory of differential equations to solve the problems. Competence in interpreting results and ability to communicate principles of theory of differential equations to relevant stakeholders.			

Module code: MAYM 615, 616, 622, 623	Credits 18	Semester 1 or 2	NQF level 8
Title: Capita Selecta			
Module outcomes: Competence in the understanding of fundamental principles of the topic. Competence in identifying problems, and application of the topic to solve the problems. Competence in interpreting results and ability to communicate principles of the topic to relevant stake holders.			

Module code: MAYM 625	Credits 30	Semester 2	NQF level 8
Title: Research Project			
Module outcomes: Competence in the understanding of research methods. Competence in identifying problems, and application of research methods to solve the problems. Competence in interpreting and ability to communicate results to relevant stake holders.			

MA.2.12 MASTERS OF SCIENCE IN(MSc) IN MATHEMATICS

Module code:MAYM 811, 812, 821	Credits 30	Semester 1 or 2	NQF level 9
Title: Capita Selecta			
Module outcomes: Competence in the understanding of fundamental principles of the topic. Competence in identifying problems, and application of the topic to solve the problems. Competence in interpreting results and ability to communicate principles of the topic to relevant stakeholders.			

Module code: MAYM 822	Credits 30	Semester 1 or 2	NQF level 9
Title: Research Project			
Module outcome: Competence in the understanding of fundamental principles of the topic. Competence in identifying problems, and application of the topic to solve the problems. Competence in interpreting results and ability to communicate principles of the topic to relevant stakeholders.			

MA.2.13 HONOURS PHYSICS

Old code: PHY 707 New code: PHYM 611	Credits 12	Semester 1	NQF level 8
Title: Statistical Mechanics			
Module outcomes: A student should be able to discuss different thermodynamic phenomena found in several fields of physics. The following topics will be covered, the statistical basis of thermodynamics; elements of ensemble theory; the canonical ensemble; the grand canonical ensemble; formulation of quantum statistics; the theory of simple gases; ideal bose systems; ideal fermi systems.			

Old code: PHY 717 New code: PHYM 612	Credits 18	Semester 1	NQF level 8
Title: Quantum Mechanics			
Module outcomes: A student should be able to use the theory learned to explain and appreciate phenomena that use microscopic particles. The following topics will be covered, Spin; dynamics of two-level systems; linear vector spaces in quantum mechanics; quantum dynamics; rotations and other symmetry operations; bound state perturbation theory; time-dependent perturbation theory			

Old code: PHY 727 New code: PHYM 613	Credits 18	Semester 1	NQF level 8
Title: Classical Mechanics			
Module outcomes: Ability to: recall the theories and techniques of advanced classical mechanics, apply the theories and techniques to the solution of advanced problems in classical mechanics. Topics to be covered: Variational principles and lagrange's equation; two-body central force problems; small oscillations; special relativity in classical mechanics; hamilton's equation; canonical transformation.			

OLD CODE PHY 737 NEW CODE PHY 614	Credits 18	Semester 1	NQF level 8
Title: Electromagnetism			
Module outcomes: Ability to: emphasize the behaviour of em waves in matter, and understand the practical applications of em waves. Solve problems of electromagnetism at an advanced level. The following topics will be covered fundamentals of electromagnetic; multiple fields; the equations of laplace and poisson; the electromagnetic field equation; electromagnetic waves. Reflection and refraction. The leinard - weichert potentials and radiation; radiation systems. Classical electron theory.			

OLD CODE PHY 747 NEW CODE PHYM 615	Credits 12	Semester 1	NQF level 7
Title: Nuclear Physics			
Module outcomes: Ability to: recall the theories and techniques of advanced nuclear physics, apply the theories and techniques to the solution of advanced problems in nuclear physics. The following topics will be covered, nuclear deformations and the unified model. Electromagnetic interactions; weak interactions; strong interactions; nuclear interactions; scattering theory; resonant scattering and reactions. Spin of nuclei and polarization.			

Old code: PHY 757 New code: PHYM 626	Credits 12	Semester 2	NQF level 8
Title: Solid State Physics			
Module outcomes: Ability to emphasize the behaviour of solids in matter and understand the practical applications of solids. Topics to be covered; Band theory; semiconductors; inharmonic effects in crystals; dielectric properties; diamagnetism; paramagnetism; ferromagnetism and anti-ferromagnetism; magnetic resonance; defect; superconductivity.			

Old code: PHY 767 New code: PHYM 627	Credits 24	Semester 1+2	NQF level 8
Title: Computational Physics			
Module outcomes: A student should be able to use the theory learnt to quantify results from experimental work and projects at post-graduate level. The following topics will be covered, Laplace transforms; fourier series and integrals; vector differential calculus; partial differential equations; numerical analysis and in practical sessions computer implementation of programmes to solve common numerical problems of physics and computer-based practice on the use of common computer packages.			

Old code: PHY 787 New code: PHYM 671	Credits 24	Semester 1+2	NQF level 8
Title: Project Or Prescribed Experiments			
Module outcomes: Ability to articulate a research proposal, carry out literature review, design a research strategy, carry out experiments specific to a given problem, analytically interpret results of research or experiments and produce a research report.			

Old code: PHY 797 New code: PHYM 629	Credits 12	Semester 2	NQF level 8
Title: Astrophysics			
Module outcomes: Learners should be able to understand concepts of stellar physics, be able to have an idea of how concepts from atomic physics are used to determine, parameters such as composition, temperature, surface gravity and velocities of stars and be able to use analytical and computational techniques to solve equations of stellar structure.			

MA.2.14 HONOURS ELECTRONICS

Old code : ELE 701 New code: ELYM 611	Credits 18	Semester 1	NQF level 8
Title: Microprocessor Systems Design			
Module outcomes: The student should be able to describe and layout a simple microprocessor based system together with support hardware. Topics to be covered; Von-Neumann and Harvard architecture. Hardware configurations. Low-level programming.Interfacing to the external world.			

Old code : ELE 702 New code: ELYM 612	Credits 18	Semester 1	NQF level 8
Title: Signals, Circuits And Systems			
Module outcomes: The student should be able to understand the relationship between analogue and digital signals, the representation of analogue signals by discrete sampling, the basics of digital signal processing and the role of digital signal processors as well as acquire the ability to design algorithms for recovery of signals.			

Old code : ELE 703 New code: ELYM 613	Credits 18	Semester 1	NQF level 8
Title: Electronic Instrumentation - Sensors And Transducers			
Module outcomes: The student should be able to explain the operation of existing sensors, and the manner in which sensors fit into systems and devise new sensors for specific applications based on the principles imparted.			

Old code : ELE 704 New code: ELYM 624	Credits 18	Semester 1	NQF level 8
Title: Computational Methods			
Module outcomes: The student should acquire skills in the translation of physical problems into models that can be manipulated on a computer, designing and building such models using a high level programming language like Fortran.			

Old code : ELE 707 New code: ELYM 625	Credits 18	Semester 1	NQF level 8
Title: Embedded Controllers			
Module outcomes: The student should demonstrate a thorough knowledge of embedded controller architecture, applications, programming and interfacing with the external world. The student should be very familiar with the PIC series of micro-controllers at both the hardware level and the software level, in particular the PIC16f877.			

Old code: ELE 708 New code: ELYM 626	Credits 18	Semester 2	NQF level 8
Title: Electromagnetics			
Module outcomes: Students should acquire theory and methods applied in the solution of relatively rigorous electromagnetic problems such as scattering from objects of arbitrary shapes, and ability to design and analyse antennas for various applications in communication.			

Old code : ELE 709 New code: ELYM 671	Credits 30	Semester 1+2	NQF level 8
Title: Honours Project			
Module outcomes: The student should acquire the ability to formulate a problem, research it and arrive at a solution, and present the solution in a coherent and professional manner in the form of a report, a working model and other outputs. The ability to use the library and other resources is also a clear outcome.			