PROSPECTUS 2020

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Faculty of Agriculture & Natural Resources

Open your mind

UNAM
UNIVERSITY OF NAMIBIA

FACULTY PROSPECTUS 2020

FACULTY OF AGRICULTURE AND NATURAL RESOURCES

NOTE

This Faculty Prospectus is valid for 2020 only. Regulations and curricula may be amended without prior notice. General regulations and information appear in the General Information and Regulations Prospectus.

Although the information contained in this Faculty Prospectus has been compiled as accurately as possible, Council and Senate accept no responsibility for any errors and omissions that may occur. The University retains the right to amend any regulation or condition without prior notice.

The information is correct up to 31 October 2020.

The fact that particulars of a specific programme, subject or module have been included in this Faculty Prospectus does not necessarily mean that such a programme, subject or module will be offered in 2020or any subsequent year.

This Faculty Prospectus must be read in conjunction with the General Information and Regulations Prospectus.

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FACULTY PREAMBLE

MISSION

The Mission of the Faculty of Agriculture and Natural Resources is to promote sustainable agricultural and natural resource development and management in Namibia through teaching, research and extension services to communal and commercial farming communities.

OBJECTIVES

The objectives of the Faculty are:

- to provide education and training, aimed at producing degree level graduates in the fields of Agriculture and Natural Resources, who will be well equipped with knowledge, skills and attitudes that will help improve agricultural productivity and promote sustainable agricultural development, wise use of resources and increase Namibia's food security;
- to conduct research aimed at extending the frontiers of knowledge relevant to Namibia's environment, natural resources and agriculture;
- to provide advisory, consultancy and extension services on the proper and sustainable use of Namibia's agricultural and natural resources to the communities;
- to catalyze increased production and productivity of Namibia's natural resources;
- to help create meaningful employment in both the public and private sector including self-employment; and
- to promote an environment that will enhance equity and access to education and training in Agriculture and Natural Resources development and management.

"Training & Research to Feed the Nation"

FIRST SEMESTER

06 January	Start of Summer Term (Until 26 January)
09 January	University Open
21 January	Academic staff resumes office duties
03 February	Lectures commence for FIRST SEMESTER
16 March	First semester BREAK starts
23 March	Lectures commence after first semester break
08 May	Lectures end for FIRST SEMESTER
14 May	Regular Examinations commence
05 June	Regular Examinations end
15 June	Special/Supplementary Examinations start
26 June	End of FIRST SEMESTER
29 June	Start of Winter Term (until 17 July)

SECOND SEMESTE

20 July	Lectures commence for SECOND SEMESTER
24 August	Second semester BREAK starts
28 August	Lectures resume after second semester break
16 October	Lectures end for SECOND SEMESTER
22 October	Regular Examinations commence
12 November	Regular Examinations end
20 November	Special/Supplementary Examinations start
02 December	End of SECOND SEMESTER
15 December	End of academic year
07 January 2021	Start of Summer School (until 25 January)
11 January 2021	University opens (2021 academic year)
21 January 2021	Academic staff resumes office duties

DUE DATES FOR THE 2020 ACADEMIC YEAR

DATE	GENERAL DATES
17 January	Last day for appeals (Semester 2 & Double modules – Regular and Supplementary/Special examinations of November 2019)
7 February	Last day for application of retention of continuous assessment (CA) mark and Last day for application for exemption(s)
7 February	Last day for Late Registration (*Late fee payable*)
7 February	Last day for approval of exemption(s)
7 February	Last day for approval of module(s) & qualification changes
12February	Last day for recommendation of retention of continuous assessment mark and Promotion Examinations by Faculties
14 February	Last day for approval of retention of continuous assessment mark and Promotion Examination by Examinations Department
28 February	Promotion Examination
29 April	Last day for change of offering types at Regional Centres (Semester 1 modules)
3 August	Last day for Appeals (Semester 1 Modules - Regular and Supplementary/Special examinations of June 2019)
21Augustus	Last day to submit outstanding documentation
20 September	Last day to change offering types at Regional Centres (Semester 2 modules)
18 September	Last day to cancel enrolment
30 October	Last day to submit Theses and Dissertations for examinations
DATE	CANCELLATION DUE DATES
30 April	Last day to cancel Semester 1 modules
18 September	Last day to cancel Semester 2 modules
18 September	Last day to cancel Double modules (module that extends normally over one academic year
DATE	FINANCE DUE DATES
2 March	Last day to cancel Semester 1 and Double modules with 100% credit
03 April	Last day to cancel Semester 1 modules with 50% credit
5 June	Last day to cancel Double modules with 50% credit
07 August	Last day to cancel Semester 2 modules with 100% credit
31 August	Last day to cancel Semester 2 modules with 50% credit

STRUCTURE AND PERSONNEL OF THE FACULTY

ACADEMIC STAFF BY CAMPUSES AND DEAN OFFICE

OFFICE OF THE DEAN

☏ (+264 61) 206 3890 🖷 (+264 61) 206 3013 💻 sangombe@unam.na ✉ Private Bag 13301, Windhoek, Namibia

Dean:	Dr S T Angombe: BSc (Unam), PDipNaReM (Autralian National University, Canberra – Australia), MSc (Autralian National University, Canberra - Australia), PhD In Agric Ecology (Moscow State Agricultural University, Russia)
Deputy Dean:	Dr T O Amushendje: B.Sc. (Hons), Molecular Biology (Murdoch University, Western Australia); PhD, Molecular Genetics and Wool Science (Lincoln University, New Zealand).
Head of Department: Faculty Postgraduate Studies	Prof H M Bello: B Sc (Hons) Agriculture (Ahmadu Bello University- Nigeria); M Sc Agric Economics (Texas A & M University, USA); Ph.D. Agric Economics (Usmanu Danfodiyo University, Nigeria)
Faculty Officer:	Ms Belinda Bock: Bachelor in Business Administration (UNAM)
Examinations Officer:	Ms Josefina Muhama: Bachelor in Agricultural Science (Namibia University of Science and Technology).
Secretary:	Mrs Lillian Jo-Ann Smith:- Degree Systems Engineering (City and Guilds UK), Diploma in Namibian Labour Act (Labour Dynamics), Certificate in Accounting Bookkeeping Keeping (Damelin)
Faculty Librarian:	Ms M T TJITUKA: B.A. (Hons) Public Admin (Polytechnic of Wales); Postgraduate Dipl in Library & Info Studies (University College London); M .A. Library & Info Studies (University of London); Cert. Advanced Studies in Library & Info. Sci (Long Island Univ, New York)
Subject Librarian	Ms N S T Uugwanga: Diploma Information Studies (UNAM); B A Library Science & Records Management & History (UNAM); Postgraduate Diploma in Library & Information Studies (UCT); Master in Libarary and Information Studies (UCT)
Senior Library Assistant:	Mr T Ntesa: Dipl Information Studies (UNAM); B Arts: Information Science (UNISA)
Library Assistant:	Ms E Nguvauva: Dipl Records Management (Southern Business School); B Arts: Information Science (UNISA)
Library Assistant:	Mrs M Kaahangoro: Dipl Records Management (Southern Business School); B Arts: Information Science (UNISA)

NEUDAMM CAMPUS

☎ (+264 61) 206 4111 🖷 (+264 61) 206 4027 💻 @unam.na ✉ Private Bag 13188, Windhoek, Namibia

Campus APVC / Director	Dr A Mosimane : BA (UNAM), Post Graduate Diploma Higher Education (UNAM), B.A. Hons (UNAM), M. Environment and Development (University of Natal), PhD (University of KwaZulu Natal)
Farm & Campus Manager	vacant
Campus Administrator:	Mrs. S. Juliet Mudabeti: BPsych. Hons (UNAM), M. Leadership and Change Management(NUST),Public Management Certificate(UNISA)
Student Support Officer:	Mr. A. Kandjimi: BA (UNAM), Dip. Local Government Studies(UNAM), Certificate in Procurement(AMAD University)
Farm Manager:	Mr E Beukes: National Dipl. Agric (Tsumis)
IT Support Technician:	Mr M Geigub: MCSE- Microsoft Certified System Engineer; MCSA- Microsoft Certified System Administrator; CISCO; MCITP-Microsoft Certified IT Profession
Administrative Assistant:	Ms A R Beukes:
Cashier:	Ms I W Mouton:
Estates Officer:	Mr S Isaacs: Dipl. Urban Housing (IHS)

Supervisor:	vacant
Supervisor:	Mr P Beukes: National Dip. Agric (Tsumis)
Supervisor:	Mr B M Matomola: National Dip. Agric (Neudamm)
Supervisor:	Mr J Ngavetene: National Dip. Agric (Neudamm); B.Ed (UNAM); B.Agric Hons (Polytechnic of Namibia)
Supervisor	Mr G Sheehama: National Dip. Agric(Ongongo), Higher Diploma in Education(North West University), B. Hons Agric Extension(University of Pretoria)
Supervisor:	Mr W Goussard: Trade Dip. Petrol/Diesel Mechanic
Assistant Supervisor:	Mr G /Gomxob: Trade Dip. Diesel Mechanic
Assistant Supervisor:	Mr. A. Tjiriange: Dip. Agric(Ongongo)
Assistant Supervisor:	Mr R Fredericks
Assistant Supervisor:	Mr R Kandjou
Assistant Supervisor:	Mr I Lisias

OGONGO CAMPUS

☎ (+264 65) 223 5000 🖷 (+264 65) 223 5265 🖳 wamutenya@unam.na ✉ Private Bag 5520 Oshakati, Namibia

Campus APVC / Director	Dr C. Mberema: B.Sc. Agric (UNAM); M.Sc. Animal Science, (University of Arizona USA); PhD, Molecular Genetics and Meat science (Newcastle University, UK)
Deputy Director: A A & R	Mr B Thomas: B Sc Agric (UNAM); M Sc Agric Econ (Stellenbosch):
Campus Manager:	Mr M Nghihangwa: Dipl. PA (Polytechnic of Namibia); B-Tech (Unisa); Cert Ad Ed (Unisa); MpA (Univ Western Cape)
Farm Manager:	Mr. S. Martin: National Dipl Agric (Neudamm); B Sc Agric (Univ Free State, Bloemfontein)
Assistant Faculty Officer:	Vacant
Student Support Officer:	Mr Willem Amutenya: B.Ed (Science), (Unam), M.Ed Leadership and Management Policy (IUM)
Examinations Officer:	Ms J Amupolo: B. Econ (Unam); B.Econ (Hons) Univ Western Cape
Farm Administrator:	Mr V Namwoonde: Dipl Agric (Ogongo College)
Subject Librarian:	Ms C N Nakanduungile: Dip Information Studies (UNAM); B A Library Science & Records Management, Psychology (UNAM)
Senior Library Assistant:	Mr J Kambuta
Library Assistant:	Ms T N Andowa
Library Assistant:	Ms S Shiimbi: Dipl Information Studies
Library Assistant:	Vacant
Administrative Assistant:	Ms Hileni Utoni
Assistant Stores Controller:	Ms. A. Negwila
Finance and Procurement Officer:	Mr. H. Uupindi
Supervisor: (Cereal & Fodder)	Mr. T. Lwiinga: Certificate in Rice Cultivation Theory (Nagoya University Japan) Diploma in Agronomy (Idilio Rodriquez –Technical Institute , Cuba)
Supervisor:	Vacant
Supervisor: (Horticulture)	Mr. M. Shishwandu; Dipl Agric (Ogongo); Bachelor of Agric Management (Polytechnic of Namibia)
Manager: (Dairy & food production)	Mr. A. Malyenge: Dipl Agric (Ogongo); Dipl in Total quality Management (UNISA); BSc (Hons) Food Science and Technology (Putra University, Malaysia)
Assistant Supervisor: (Natural Resource)	Ms. T. Muhama: Certificate in HIV Counselling (UNAM); Diploma in Agronomy (Sovhoz-technicum.V.I Lenin, USSR).
Assistant Supervisor: (Livestock)	Mr. D. Shikola: Dipl Agric (Ogongo); Bachelor of Agric Management (Polytechnic of Namibia)

Supervisor: (Workshop)	Mr. J. Kangulu: Certificate in Automobile (German Technical Institute; Sri lanka); Certificate in Measuring and Testing (Mbabane University; Swaziland)
Assistant Supervisor (Workshop)	Mr. T. Frans: Grade 12, Certificate in Auto electric (Valombola VTC)

SAM NUJOMA CAMPUS

☎ 🖷 (+264 64) 502 600 💻 euahindua@unam.na ✉ P.O. Box 462, Henties Bay, Namibia

Campus APVC/Director:	Dr H O Ndjaula: B.Sc. (UNAM), M.Phil Diploma(Univ of Bergen), M.Phil (Univ of Bergen), PhD.(Univ of Bergen),
Deputy Director : Academic Affairs & Research	Dr J A Iitembu: B.Sc. (UNAM), M.Sc. (Univ. of Tromso), PhD (Rhodes)
Office Administrator:	Ms E Uahindua: Secretarial Certificate (CCOSA - Zimbabwe)
Assistant Librarian:	Ms L Iipinge: B.A. Library Science and Resource Management (UNAM)
Library Assistant:	Mr E Thaniseb: Dipl Library and Information Studies (Univ of Botswana)
Estates Officer:	Mr M Dominicus: Dipl (WVTC)
Security Officer	Mr TS Shaanika
Students Support Officer:	Mr Bernardo Evaristus (Office of the Dean of Students)
Student Records Officer and Examination Officer:	Mr M Kangootui: Adult Basic Education & Training Certificate (ABET), UNISA; Dipl Public Management (Polytechnic of Namibia)
IT Officer:	Mr T Nampala

General enquiries regarding the programmes offered by the Faculty of Agriculture and Natural Resources should be directed to:

The Faculty Officer
Faculty of Agriculture and Natural Resources
University of Namibia
Private Bag 13301
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E-mail: bbock@unam.na
Website: www.unam.na → FANR (Faculty of Agriculture & Natural Resources)

OR

The Assistant Faculty Officer
Faculty of Agriculture and Natural Resources
University of Namibia
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Namibia

Tel: (065) 223 5000
Fax: (061) 223 5294
E-mail:
Website: www.unam.na → FANR (Faculty of Agriculture & Natural Resources)

Enquiries regarding specific subjects and departments must be addressed to the relevant Head of Department.

ACADEMIC STAFF BY DEPARTMENTS AND SCHOOL

DEPARTMENT OF AGRICULTURAL ECONOMICS (NEUDAMM CAMPUS)

☎ (+264 61) 206 4039 🖷 (+264 61) 206 4027 💻 cnjona@unam.na ✉ Private Bag 13188, Windhoek, Namibia

Head of Department:	Dr CN Jona
Associate Professor:	Prof HJ Sartorius von Bach, B.Sc. Agric Economics (cum laude (University of Pretoria); B.Sc. (Hons) Agric Economics (cum laude (Pretoria); M.Sc. Agric Economics (Pretoria); PhD Agric Economics (Pretoria)
Senior Lecturer	Mr B Thomas: B Sc Agric (UNAM); M Sc Agric Econ (Stellenbosch)
Lecturer:	Mr S K Kalundu: Nat Dip Agric (Neudamm); B.Sc. Agric (UNAM); M.Sc. Agric Econ (Arkansas, USA)
Lecturer:	Mr KG Kampungu: B Sc Agric Economics (UNAM); M Sc Agric Economics and Management, Beijuing Forestry University, China
Lecturer:	Ms M M Hangula: Nat Dip Agric (Ogongo); B.Sc. Agric (UNAM); M. Sc. Agric & Resource Econ (Alberta, Canada)
Lecturer:	Mr M N Angula: Nat Dip Agric (Ogongo); B.Sc. Agric (UNAM); M.Sc. (Michigan,USA)
Lecturer:	Mr M M Eiseb: Dip Agric (Polytechnic); B.Sc, M.Sc. Agric Econ (Fort Hare)
Lecturer:	Mr C Togarepi: Bsc Agric (UNAM); PGDE (UNAM), M.Sc Agric Econ (UNAM)
Senior Lecturer:	Dr C N Jona: B.Sc. Agric (UNAM); B.Sc. (Hons) (Pretoria); M.Sc. Agric Extension (Pretoria); PhD Agric Extension (Pretoria)
Lecturer:	Mr J N Muzanima: B Sc Agric Economics (UNAM); M Sc Agric Economics (IARI, India)
Lecturer:	Mr T Maharero: B.Sc. Agric (Natal), MBA (MANCOSA), South Africa
Assistant Lecturer:	Ms E R Sheehama: B.Sc. Agric (UNAM); B.Sc. (Hons) Free State Univ.

DEPARTMENT OF ANIMAL SCIENCE (Neudamm Campus)

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Head of Department:	Dr E Lutaaya
Professor:	Prof. J. Mupangwa (BSc Animal Science, University of Zimbabwe; MSc Grassland Science (with Distinction), University of Reading, United Kingdom; PhD Animal Science (Animal Nutrition), University of Zimbabwe).
Associate Professor:	Vacant
Senior Lecturer:	Dr E Lutaaya: B.Sc. Agric. (Makerere); M.Sc. Animal Breeding (Texas A & M); PhD Animal and Dairy Science [Quantitative Genetics](University of Georgia, USA).
Senior Lecturer:	Dr T O Amushendje: B.Sc. Molecular Biology (Murdoch University, Western Australia); PhD, Molecular Genetics and Wool Science (Lincoln University, New Zealand).
Senior Lecturer:	Dr N P Petrus: B.Agric. (Animal Science) University of Nigeria Nsukka, Nigeria; M.Sc. (CIRAD- Montpellie (France), Animal production in the tropics; PhD Poultry (Nutrition and Genetic characterization) (UNAM)
Lecturer:	Dr S P Muteka: B.Sc. (Concordia), M.Sc. (Pretoria), PhD Zoology (Reproductive Biology) [University of Pretoria, RSA]
Lecturer:	Dr C Mberema: B.Sc. Agric (UNAM); M.Sc. Animal Science, (University of Arizona USA); PhD, Molecular Genetics and Meat science (Newcastle University, UK)
Lecturer:	Ms M Shipandeni: National Dip Agric (Ogongo), B.Sc. Agric (UNAM); MSc. Animal Nutrition (University of Wageningen, Netherlands)
Lecturer:	Dr A Kahumba: Diploma Agric, BSc Education Science (UNAM), MSc RR&M (UNAM), PhD. Agriculture (Pasture Science) [University of Fort Hare, RSA]

Lecturer:	Ms T Uushona: B Sc Agric. (UNAM); M Sc Agric (cum laude) (University of Stellenbosch)
Biostatistician:	Ms V Charamba: BSc Hon. Statistics (UZ); MSc Statistics (UZ)
Technologist:	Ms A Nambahu: National Diploma Agric; B.Sc Agric.(Hons) (UNAM)
Senior Technologist:	Mrs S Shihepo: BSc Agric. (UNAM); M.Sc. Agric. (Animal Nutrition) (UNAM)

DEPARTMENT OF CROP SCIENCE (Ogongo Campus)

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Head of Department:	Prof F D Itanna
Professor:	Prof O D Mwandemele: B.Sc. Hons; M.Sc. (Dar-es-Salaam); PhD (Sydney); Elected Fellow (ISGPB), Member UNU/INRA College of Res. Associates
Professor:	Prof F D Itanna: BSc (Alemaya), MSc (Alemaya), PhD (University of Hohenheim)
Professor:	Prof L S M Akundabweni: BSc, (Minnesota), MSc, PhD (South Dakota)
Lecturer:	Dr S K Awala: National Dip Agric (Neudamm); B.Sc. Agric (UNAM), M. Agric. Sc. (Nagoya Univ., Japan); PhD (Kindai Univ., Japan).
Lecturer:	Dr P I Nanhapo: B.Sc. Agric (UNAM); M. Agric. Sc. (Nagoya Univ., Japan); PhD (Kindai Univ., Japan)
Lecturer:	Mr K Hove: B Sc Mathematics (Hons) (MSU); M. Sc Operations Research (NUST-Zim); PGDE (NUST-Zim)
Lecturer:	Mr. K Elungi: B.Sc. Agric (UNAM); M.Sc. Plant Pathology (UKZN); MBA (NUST-Harold Graduate School of Business)
Lecturer:	Mr F Shinombedi: M.Sc. Agric Eng (Czechelsovakia)
Lecturer:	Mr G Hatutale: B.Sc. Agric (UNAM), M.Sc. Horticulture (Free State Univ)
Lecturer:	Mr J Chigariro: Dipl Agric (Gwebi, Zim); PGDipl Grain Storage Management (UK); M Sc Grain Storage Management (Greenwich University, UK)
Lecturer:	Mr L Nuugulu: B.Sc Agric Crop (UNAM); B Sc (Hons) Agronomy (Univ of Free State);Msc Horticulture (University of Free State)
Lecturer:	Dr B Mudamburi: Dip Agric (Chibero, Zim); B.Sc. Hons, (Cranfield, UK); MSc. (Wageningen); PhD. (UNAM)
Assistant Lecturer:	Ms H Kandongo: B.Sc. Agric Mechanisation (Karl Marx University)
Staff Dev Fellow:	Ms C K Kamburona-Ngavtene: B.Sc. Agric (UNAM); MSc. Genetics (Pretoria). Study Leave (Germany) Mr P A Ausiku: National Dip Agric (Ogongo); B.Sc. Agric (UNAM); M Sc Agric (Kinki Univ,, Japan), Study Leave (Univ. of Pretoria). Ms O T Shivolo: Nat'l Dip Agric (Ogongo); B.Sc. Agric (UNAM), M.Sc. Crop Protection (University of Nairobi, Kenya. Study Leave (Nigeria)
Senior Technologist:	Ms A N Aluvilu: National Dip. Agric (Polytechnic of Namibia); B. Tech Agric (Cape Technikon), M. Agric (University of Limpopo)
Technologist:	Mr R Shou: National Diploma in Agric (Ogongo); B Sc in Agric (Hon) Crop Science (UNAM)
Laboratory Technician:	Ms Johanna S Valombola: Nat Diploma in Agriculture (Ogongo), B Sc in Agric (Hon) Crop Science (UNAM)

DEPARTMENT OF FOOD SCIENCE & TECHNOLOGY (Neudamm Campus)

☏ (+264 61) 206 4003 🖷 (+264 61) 206 3013 💻 phiwilepo@unam.na mnambabi@unam.na ✉ Private Bag 13301, Windhoek, Namibia

Head of Department:	Dr P Hiwilepo-van Hal
Senior Lecturer:	Dr M NNN Shikongo-Nambabi: B Sc Hons Biochemistry (Kent Univ); M Sc Applied Immunology (Brunel Univ); PhD Microbiology (Univ. Pretoria)

Senior Lecturer:	Dr K K M Nantanga: B Sc (UNAM); B Sc Hons (Rhodes Univ); M Sc (Univ. Pretoria); PhD (Univ Guelph, Canada)
Senior Lecturer:	Dr P Hiwilepo-van Hal: B Sc Agric, Food Science & Technology (UNAM); M Sc, PhD Food Science (Wageningen)
Lecturer:	Mr C Samundengu: B Eng.(UNZA); B Eng. Hons, M Eng.(Univ Pretoria); Posgraduate Dipl Bus Admin (UNAM); M Sc Acc & Finance (UNAM)
Lecturer:	Dr S C Barrion: B Sc Agric, Food Science & Technology (UNAM); B Sc Hons Food Science (Univ Pretoria); M Sc (Distinction) Food Science & Technology (Univ Pretoria); PhD in Nutritional Sciences (University of Surrey)
Lecturer:	Ms M J Kandjou: B Sc Agric, Food Science & Technology (UNAM); M Sc Dairy Science & Technology (Univ Zimbabwe)
Lecturer:	Mr S Emvula: B Sc Agric Food Science & Technology (Unam); M Sc Food Science (Stellenbosch)
Technologist:	Ms W V Kanime: National Dipl Agric (Ogongo); B Sc Agric, Food Science & Technology (UNAM); M Sc Food Science (Stellenbosch)
Technologist:	Ms M H Hamunyela: B Sc Microbiology & Biochemistry (UNAM); MSc Biology (UNAM)

DEPARTMENT OF FISHERIES & AQUATIC SCIENCES (Sam Nujoma Campus)

🖷 (+264 64) 502 464 💻 lkandjengo@unam.na ✉ P.O. Box 462, Henties Bay, Namibia

Head of Department:	Mr L Kandjengo
Professor:	Vacant
Senior Lecturer:	Mr F P Nashima: B.Sc. (UNAM); M.Sc. (UNAM) (*On Study leave*)
Senior Lecturer:	Dr S K Mafwila: B.Sc. (UNAM); PGDE (UNAM); B.Sc.Hons (Rhodes); M.Sc. (UCT) PhD (UCT)
Senior Lecturer:	Dr J A Iitembu: B.Sc. (UNAM), M.Sc. (Univ. of Tromso), Ph.D. (Rhodes)
Lecturer:	Dr M Wilhelm: BSc Hons (UCT), MSc (UCT), PhD (UCT)
Lecturer:	Mr L Kandjengo: B.Sc. (UNAM); B.Sc. Hons (UCT), M.Sc. (UCT)
Lecturer:	Mr M Tjipute: B.Sc. Astrakhan State Technical Univ, Russian Federation); M.Sc. (Russia); Postgraduate Certificate in Sustainable Aquaculture (United Nations Univ)
Lecturer:	Mrs D N Nakwaya-Jacobus: B.Sc. (UNAM); M.Sc. (UNAM)
Lecturer:	Mr N Gabriel: B.Sc. (UNAM); M.Sc. (Nanjing Agricultural University, China)
Senior Technologist:	Mr T Akawa: B.Sc. (UNAM), M Phil (Univ. of Stellenbosch)
Technologist:	Mr M Hanghome: ND Natural Resources Management (NUST), Bachelors Cert. Env Engineering (CPUT), M.Sc. (UFS)

DEPARTMENT OF INTEGRATED ENVIRONMENTAL SCIENCE (Ogongo Campus)

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Head of Department:	Dr J R Kambatuku
Professor:	Prof G Kopij: M.Sc. Zoology (Wroclaw University), Ph.D. Wildlife Ecology(Free State University, Bloemfontein), D.Sc. Wildlife Ecology(Ceske Budejovice).
Associate Professor:	Dr J Njunge: B.Sc. Forestry (Moi University); M.Sc. Plant and Fungal Taxonomy (Reading Univ); PhD Forest Ecology (University of Wales)
Senior Lecturer:	Vacant
Lecturer:	Dr J R Kambatuku: B Sc Zoology & Botany (Unam); M Sc Water Resources (Univ Wales); PhD Ecology (Univ Kwazulu-Natal)
Lecturer:	Dr E Ndeunyema: National Dip Agric (OAC); B.Sc. Forestry (Wales Univ, Bangor); M.Sc. Agroforestry (Wales Univ, Bangor), PhD Forestry (ethnobotany) (Wales Univ, Bangor)
Lecturer:	Dr A Ndeinoma: National Dipl Agric (OAC); B.Sc. Forestry, M.Sc. Environmental Impact Assessment (Stellenbosch); Postgraduate Diploma in

	Education (UNAM), PhD. Governance of Natural Resource Products (Wageningen University, The Netherlands)
Lecturer:	Mr F Nambuli: National Diploma in Forestry (Ogongo UNAM Campus); B-Tech in Nature conservation (Nelson Mandela Metropolitan University); MSc in Environmental and Resource Management (Brandenbugische Technische Univestat Cottbus)
Lecturer:	Mrs LKEM Halueendo: B.Sc. Zoology, Botany & Psychology (UNAM); B.Sc Hons Crop Protection (Pretoria); M.Sc. Crop Protection (Pretoria), Professional Diploma in Education (UNAM).
Lecturer:	Mr I Kaholongo: Cert Forestry (OAC); B.Sc. Forestry (Stellenbosch); M.Sc. Biodiversity Management and Research (UNAM)
Lecturer:	Ms J Niipele: B.A. Tourism (UNAM); M. Sc. Geo-Information Science & Earth Observation Nat Res Mgt (Univ. Twente, The Netherlands) on study leave
Lecturer:	Mr E Kasiringua: M.Sc. Applied Ecology (Hedmark University College) on study leave
Lecturer:	Mr T Nsio Nzundu (Pr. Phys): B.Sc (Hons) Physics (Univ of Kinshasa); Postgraduate Diploma in Mathematical Sciences (African Institute of Mathematical Science AIMS - UCT); M.Sc Physics (Stellenbosch).
Lecturer:	Mr. S Mulele, BSc Natural Resources (UNAM), PG Certificate in Environmental Engineering (Cape Penisula University of Technology, BSc (Honours) Geohydrology (University of Free State), MSc Environment and Sustainability (University of South Australia)
Technologist:	Ms A I Shipanga: B.Sc. Environmental & Physiological and Molecular Biology (UNAM)Mr
Technologist:	Mr F Ekondo: National Dip Natural Resource Management (Polytechnic of Namibia); B Tech Agric Management (Polytechnic of Namibia); B. Hons Agric Management (Free State Univ)Technology (Univ Pretoria)
Field Supervisor:	Vacant

DEPARTMENT OF WILDLIFE MANAGEMENT (Katima Mulilo Campus)

 (+264 66) 262 6000 🖷 (+264 66) 253 964 💻 eklingelhoeffer@unam.na Private Bag 1096, Venela Road, Katima Mulio, Namibia

Head of Department:	Dr E Klingelhoeffer	
Associate Professor:	Vacant	
Senior Lecturer:	Dr E Klingelhoeffer	PhD – Oceanography/Fish Stock Assessment: University of Port Elizabeth (UPE) - Nelson Mandela Metropoliten University, South Africa; Master of Science (MSc) – Terrestrial Ecology/Wildlife Management (University of Pretoria), South Africa; Bachelor of Science Honours (BSc Hon) in Wildlife Management (University of Pretoria, South Africa); Bachelor of Science (BSc) with major in Zoology and Botany: University of Port Elizabeth (UPE) – South Africa; Tertiary Education Diploma (major in Androgocics and Gerongocis) – University of South Africa (UNISA), South Africa.
Lecturer:	Dr E C Fabiano:	B Sc – Environmental Biology and Computer Science (UNAM); M Sc – Protected Area Management (University of KwaZuly-Natal (KZN); PhD – Popukation Genetics – Pontificia Catholic University of Rio Grande do Sul (PUCRS), Brazil
Lecturer:	Mr Jim Kairu	MSc Natural Resource Management (1991)- Agricultural University of Norway (AUN); PGD (1990) Management of Natural Resources and sustainable agriculture (AUN); BSc (Wildlife Management) (1988) Moi University; Diploma (Wildlife Management) (1977) -CAWM
Lecturer:	Mr J Nakanyala	MA (Geography and Environmental Studies (UNAM); BA (Geography and Environmental Studies) (UNAM)
Lecturer:	Mr E Simasiku	MSc Fisheries Ichthyology (Rhodes University) BSc Hon. Zoology (UCT); B.Sc. Fisheries and Aquatic Science (UNAM
Lecturer:	Mr M S Lukubwe	MSc (2014)- Geographical Information Science and Systems, University of Salzburg, Austria

Lecturer:	Ms S N Kosmas	B.A (2007) - Tourism, University of Namibia, Namibia; MSc (2013) Environmental and Resource Management, Brandenburg University of Technology, Cottbus, Germany, BSc. (2011) Fisheries and Aquatic Sciences, University of Namibia
Lecturer:	Dr L Rutina	BSc, Agri (Univ of Botswana; MSc &PhD Conser Biol (Univ .
Lecturer:	Dr C Kalinda	BSc (University of Zambia, UNZA); MSc – Research Methods/Statistics (Jomo Kenyatta of Agriculture and Technology (JKUAT), Kenya), PhD – Vector Ecology and Climate change (Public Health), University of KwaZulu-Natal (UKZN, South Africa)
Lab Technologist:	Mr J Amutenya	BSc (Hons) Integrated Environmental Science, UNAM Diploma in Agriculture, Ogongo College
Lab Technologist:	Ms E Kasinda	BSc (Hons) Environmental Biology & Geology , UNAM

OFFICE OF THE ASSOCIATE DEAN SCHOOL OF VETERINARY MEDICINE (Neudamm Campus)

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Associate Dean:	Dr A Marais: BVSc (University of Pretoria); BSc; BSc (Hons); MSc (Stellenbosch University); PhD (University of Pretoria)
Deputy Associate Dean:	Dr B Mushonga: BSc (Hons) Veterinary Anatomy; BVSc (University of Zimbabwe); MSc Veterinary Pathology (University of Utrecht)

DEPARTMENT OF BIOMEDICAL SCIENCES (Neudamm Campus)

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Senior Lecturer/AD:	Dr A Marais: BVSc (University of Pretoria); BSc (Hons); MSc (Stellenbosch University); PhD (University of Pretoria)
Senior Lecturer/DAD:	Dr B Mushonga: BSc (Hons) Veterinary Anatomy; BVSc (University of Zimbabwe); MSc Veterinary Pathology (University of Utrecht)
Senior Lecturer:	Dr E Lutaaya: B.Sc. Agric. (Makerere); M.Sc. Animal Breeding (Texas A & M); PhD Animal and Dairy Science [Quantitative Genetics](University of Georgia, USA).
Adjunct Lecturer:	G Hanstein
Lecturer:	Dr E Kandiwa: BSc (Hons, Vet Physiol) University of Zimbabwe; BVSc (University of Zimbabwe); MSc (University of Liverpool)
Lecturer:	A Raath
Lecturer:	Dr B Chiwome: BVSc (University of Zimbabwe)
Technician:	Mr U Ujava: Dip Agric (University of Namibia)
Technologist	V Ndojozi

DEPARTMENT OF PATHOBIOLOGY (Neudamm Campus)

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Head of Department:	Dr B Kahler: Dipl.bibl. (Freie Universitaet Berlin; Dr.med.vet. (Freie Universitaet Berlin)
Associate Professor:	Prof J R Lyaku: BVSc (Sokoine University of Agriculture, Tanzania); MVSc (Univ of Edinburgh, Scotland); PhD in (Univ of Glasgow, Scotland)
Senior Lecturer:	Dr C Ntahonshikira: B Sc, MSc in Veterinary Medicine (Kiev, Ukraine); PhD in Veterinary Microbiology & Virology (Kiev Veterinary Research Institute (Ukraine)
Senior Lecturer:	Dr B Kahler: Dipl. bibl. (Freie Universitaet Berlin; Dr.med.vet. (Freie Universitaet Berlin)
Senior Lecturer:	U. Molini
Lecturer:	D. Mudimba
Technologist:	A. Shoolongela
Technologist:	Ms K Mwaningange: BSc Agric (Hons) Food Science and Tech (University of Namibia)
Technologist:	Ms M M N Amukwaya: BSc Hons Microbiology and Chemistry (University of Namibia)
Vet. Para-professional:	B. Muzo (Veterinary Health technician, pathology)

DEPARTMENT OF POPULATION HEALTH (Neudamm Campus)

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Head of Department:	Dr A Bishi: BVSc (University of Zimbabwe); MSc Frie University of Berlin/University of Addis Ababa
Senior Lecturer:	Dr A Bishi: BVSc (University of Zimbabwe); MSc Frie University of Berlin/University of Addis Ababa
Senior Lecturer:	Dr M Y Hemberger: BSc. Giessen University; Dr. Med Vet Giessen University
Lecturer:	Dr B Kaurivi: BSc (Biology) University of Namibia); BVSc (University of Zimbabwe); MVSc (University of Sidney)
Adjunct Lecturer:	Dr A Olivier: BVSc (University of Pretoria)
Professor:	J Mupangwa
Lecturer:	V Charamba
Lecturer:	P Mbiri
Lecturer:	A Kahumba
Technologist:	E. Iyamboh

DEPARTMENT OF COMPANION ANIMAL CLINICAL STUDIES (Neudamm Campus)

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Head of Department:	Dr R. Hassel BVSc (University of Pretoria)
Associated Professor:	F Stegman
Senior Lecturer:	Dr R. Hassel BVSc (University of Pretoria)
Lecturer:	L. De Villiers
Lecturer:	M. Dahlberg
Adjunct Lecturer:	Dr U. Tubbesing BVSc, M. Med. Vet, (University of Pretoria)
Adjunct Lecturer:	M. Beggs
Adjunct Lecturer:	Soni Minty
Vet Para-professional	C. Paetow (Veterinary nurse)
Vet Para-professional:	M. Loschke (Veterinary nurse)

DEPARTMENT OF PRODUCTION ANIMAL CLINICAL STUDIES (Neudamm Campus)

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Head of Department:	Dr A Samkange: BVSc (University of Zimbabwe); MSc University of Pretoria
Senior Lecturer	Dr A Samkange: BVSc (University of Zimbabwe); MSc University of Pretoria
Senior Lecturer	F. Bruwer
Senior Lecturer	Dr O Aschenborn: BVSc (University of Pretoria); MSc (Sterling, Scotland)
Senior Lecturer	Dr M Jago: MA, Vet M.B. (Cambridge University), MRCVS
Senior Lecturer	F Chitate
Adjunct Lecturer:	Dr D. Rodenwoldt BVSc (University of Pretoria)
Adjunct lecturer	B. Voigts
Adjunct lecturer:	B Gorejena
Lecturer	M Hausiku
Clinician	V Mutjavikua
Vet Para-professional	L Muijwa

OTHERS

Workhand	Filemon Ngula
Workhand/Handyman	B Toromba
Driver	M Ipinge

DEPARTMENT OF ANIMAL HEALTH (Katima Mulilo Campus)

(+264 66) 2626000 (+264 66) 253934 omadzingira@unam.na Private Bag 1096, Ngweze, Katima Mulilo, Namibia

Head of Department:	Dr O Madzingira
Senior Lecturer:	Dr O Madzingira: BVSc (University of Zimbabwe): MPhil (University ofZimbabwe); M. Med. Vet.Public Health (University of Pretoria
Senior Lecturer:	Dr E N Muradzikwa: BVSc (University of Zimbabwe)
Senior Lecturer:	Dr E Masaire: BVSc (University of Zimbabwe)
Lecturer:	Dr S Chinyoka: BVSc (University of Zimbabwe
Technologist:	Ms E Mwenda B.Sc (Environmental Biology and Physiological and Molecular Biology (University of Namibia)
Field Technichian:	Mr. Nicky M Simasiku: Diploma in Animal Health (University of Namibia)
Lab Technologist:	Ms E Kasinda: Masters of Natural Resources Management (University of Science and Technology)

A. REGULATIONS

The regulations of the Faculty of Agriculture and Natural Resources (FANR) should be read in conjunction with and subject to the general regulations of the University of Namibia contained in the General Information and Regulations Prospectus.

A.1 COURSES OF STUDY

The Faculty may offer the following diploma and degree programmes:

A.1.1 UNDERGRADUATE PROGRAMMES

Diplomas

(Code)		Minimum Duration
(17HDAG)	Diploma in Agriculture	3 years full-time
(17HDNR)	Diploma in Natural Resources Management	3 years full-time
(17HDAH)	Diploma in Animal Health	3 years full-time

Degrees

(Code)		Minimum Duration
(17BSAE)	Bachelor of Science in Agriculture (Agricultural Economics) Hons	4 years full-time
(17BSAS)	Bachelor of Science in Agriculture (Animal Science) Hons	4 years full-time
(17BSCS)	Bachelor of Science in Agriculture (Crop Science) Hons	4 years full-time
(17BSFS)	Bachelor of Science in Agriculture (Food Science) Hons	4 years full-time
(17BSFA)	Bachelor of Science in Fisheries & Aquatic Sciences (Hons)	4 years full-time
(17BSIE)	Bachelor of Science in Integrated Environmental Science (Hons)	4 years full-time
(17BSWM)	Bachelor of Science in Wildlife Management & Ecotourism (Hons)	4 years full-time
(17BVET)	Bachelor of Veterinary Medicine (BVM)	6 years full-time

A.1.2 POSTGRADUATE PROGRAMMES

Degree

(Code)		Minimum Duration
(17MSRR)	Master of Science in Rangeland Resources Management	2 years full-time

Apart from the above M Sc Rangeland Resources Management degree programme, the Faculty also Offers M Sc and PhD degree programmes by research and thesis in accordance with the general regulations of the University of Namibia.

A.2 GENERAL ADMISSION CRITERIA FOR UNDERGRADUATE PROGRAMMES

A.2.1 DIPLOMA PROGRAMMES

A.2.1.1 The normal basic requirement for entrance to Diploma programmes shall be a Namibian Senior Secondary Certificate (NSSC) Ordinary Level Level or a recognized equivalent qualification, provided that a candidate has passed five subjects with a minimum of 22 points on the UNAM Evaluation Point Scale. The following minimum requirements will apply:

i) English (as a Second Language) with a "D" symbol or better;
ii) Mathematics with a "D" symbol or better;

iii) <u>For Diploma in Agriculture:</u> Any two of the following: a minimum "D" symbol Biology; a

minimum "D" symbol in Agricultural Science; a minimum "E" symbol in Physical Science (or Chemistry);

iv) For Diploma in Natural Resources Management: Any two of the following: a minimum "D" symbol Biology; a minimum "D" symbol in Agricultural Science; a minimum "E" symbol in Physical Science or Geography;

v) For Diploma in Animal Health: Any two of the following: a minimum "D" symbol in Biology; a minimum "D" symbol in Agricultural Science; a minimum "E" symbol in Physical Science (or Chemistry);

vi) Candidates may also be admitted into the above Diploma Programmes through the Matue Age provision if they meet the following conditions:
   a) They should be at least 25 years old on the first day of the academic year in which admission is sought;
   b) They should have successfully completed junior secondary school education (i.e. grade 10);
   c) They should have proof of at least five years of relevant work experience;
   d) They should pass all papers of the prescribed Mature Age Entry tests with a minimum of 50%.

A.2.1.2 Meeting the minimum admission requirements does not necessarily ensure admission. Admission is based on the number of places available and is awarded on the basis of merit after a rigorous selection process. The Faculty reserves the right to interview candidates before admission.

A.2.2 UNDERGRADUATE DEGREE PROGRAMMES

A.2.2.1 The University of Namibia General Regulations governing admission of students to first year undergraduate degree programmes shall apply.

A.2.2.2 Notwithstanding the above, candidates wishing to join the following programmes in the Faculty must have obtained the following grades at NSSC Ordinary Level, or its recognized equivalent;

A.2.2.2.1 B Sc in Agriculture (Hons): Candidates must have obtained a "C" symbol in Mathematics and Biology, and at least a "D" symbol in Physical Science, Chemistry or Physics.

A.2.2.2.2 B Sc in Fisheries & Aquatic Sciences (Hons): Candidates must have obtained a "C" symbol in Mathematics and Biology, and at least a "D" symbol in Physical Science, Chemistry or Physics.

A.2.2.2.3 B Sc in Integrated Environmental Science (Hons) and B Sc in Wildlife Management & Ecotourism (Hons): Candidates must have obtained a "C" symbol in Mathematics and Biology, and at least a "D" symbol in Geography, Physical Science, Chemistry or Physics.

A.2.2.2.4 Candidates with a three-year Diploma in Agriculture, Forestry, Natural Resources or Fisheries and Marine/Aquatic Sciences from a recognized and accredited institution may be granted admission to the Faculty's undergraduate degree programmes. Such candidates may be exempted from certain modules in the degree programme provided that equivalent modules were completed with a pass mark of 60% of higher.

A.2.2.2.5 Candidates applying for the six-year fully-fledged Bachelor of Veterinary Medicine (BVM) Programme, will have the following minimum criteria:

A.2.2.2.5.1 A Namibian Senior Secondary Certificate (NSSC) at NSSC-O (ordinary) or NSSC-H (higher level) with a minimum of 30 points in five subjects on the UNAM Evaluation Scale; or a recognized equivalent qualification. In addition to the above, the following subjects and grades will be required:

A.2.2.2.5.1.1 English with a minimum B symbol or better at NSSC Ordinary Level, or a score of 3 or better at NSSC Higher level;

A.2.2.2.5.1.2 Biology (or Life Science) with a minimum B symbol or better at NSSC Ordinary Level, or a score of 3 or better at NSSC Higher Level;

A.2.2.2.5.1.3 Biology (or Life Science) with a minimum B symbol or better at NSSC Ordinary Level, or a score of 3 or better at NSSC Higher Level;

A.2.2.2.5.1.4 Mathematics with a minimum B symbol or better at NSSC Ordinary Level, or score of 3 or better on NSSC Higher level;

A.2.2.2.5.1.5 Physical Science or Chemistry with a minimum B symbol or better at NSSC Ordinary Level, or a score of 3 or better at NSSC Higher Level;

A.2.2.2.5.1.6 Students with a score of C in English at NSSC Ordinary level and a minimum of 32 points on the UNAM Evaluation Scale will also be considered. Such students will be required to register for Communication and Study Skills (LCE3419) during the first semester of their first year of study.

A.2.2.2.6 Candidates with a three-year Diploma in Animal Health or Higher Diploma in Agriculture or related field with a combined average pass of 70% or higher from a recognized and accredited institution may also be granted admission to the Bachelor of Veterinary Medicine degree programme at the discretion of the Faculty of Agriculture and Natural Resources (FANR).

A.2.2.2.7 Candidates may also be admitted into the BVM programme through Mature Age provision if they meet the following conditions:

A.2.2.2.7.1 They should be at least 25 years old on the first day of the academic year in which admission is sought;

A.2.2.2.7.2 They should have passed senior secondary school education;

A.2.2.2.7.3 They should have proof of at least five years veterinary relevant work experience;

A.2.2.2.7.4 They should pass all papers of the prescribed Mature Age Entry tests with a minimum of 60%.

A.2.2.2.8 Candidates who have successfully completed the entire first year of the BSc curriculum may also be admitted into the first year of the BVM programme if they have passed all basic science modules (i.e. Biology, Mathematics, Physical Science and Chemistry) with a minimum score of 60% in each of these modules. These students will be exempted from those first year modules already passed.

A.2.2.2.9 Students from UNAM Foundation should have an average of 70% in each subject of the UNAM Foundation course (Mathematics, physics, chemistry, biology;

A.2.2.2.10 Graduates with a four year BSc Degree will be admitted;

A.2.2.2.11 All prospective candidates will be interviewed to assess their suitability. Part of the interview will involve a short written section.

A.2.2.2.12 Meeting the minimum admission requirements does not necessarily ensure admission. Admission is based on the number of places available and is awarded on the basis at merit after a rigorous selection process.

A.3 MATURE AGE ENTRY SCHEME FOR UNDERGRADUATE DEGREE AND DIPLOMA PROGRAMMES

A.3.1 Admission can also be considered for persons who qualify through the Mature Age Entry Scheme upon successful completion of the relevant examinations as set out in the General Information & Regulations Prospectus.

A.3.2 Candidates who, in the opinion of the examiners, merit further consideration, may be called for an oral interview before the final selection is made.

A.4 CONDUCT OF THE PROGRAMMES

A.4.1 First year B.Sc. students admitted into the Faculty will spend the year at the University's Main Campus. The students will continue with their professional training in the second year at Neudamm or Ogongo or Sam Nuuyoma Campus.

A.4.2 A student may, with the approval of the Dean and after consultation with the Head of the Department, change his/her study option for which he/she is registered. As specified in the General Regulations, a student may not change qualifications or study options later than the dates specified.

A.4.3 A student may, with the approval of the Faculty, School and Department, take modules from other Faculties provided that doing so will not affect his or her programme of study.

A.4.4 The following undergraduate Diploma programmes may be offered:

- Diploma in Agriculture (Ogongo Campus);
- Diploma in Natural Resources Management (Ogongo Campus); and
- Diploma in Animal Health (Katima Mulilo Campus).

A.4.5 The following undergraduate degree programmes may be offered:

- B Sc in Agriculture (Agricultural Economics) Hons;
- B Sc in Agriculture (Animal Science) Hons;
- B Sc in Agriculture (Crop Science) Hons;
- B Sc in Agriculture (Food Science & Technology) Hons;
- B Sc in Fisheries & Aquatic Sciences (Hons);
- B.Sc in Integrated Environmental Science (Hons) with the following two options / specializations:
- B Sc in Wildlife Management & Ecotourism (Hons)
- Bachelor of Veterinary Medicine (BVM) – six-year programme.

A.4.6 The following M Sc and Phd degree programme may be offered:

- Master of Science in Rangeland Resources Management (course work);
- Master of Science in Agriculture (by Thesis);
- Doctor of Philisophy in Agriculture (by Thesis).

A.5 DURATION OF STUDY (UNDERGRADUATE PROGRAMMES)

A.5.1 Subject to the provisions of Faculty Special Regulations the minimum duration of full-time study for a Bachelor's degree shall normally be four years, and that of the Diploma normally three years.

A.5.1 Subject to the provisions of Faculty Special Regulations the minimum duration of full-time study for a Bachelor's degree in Veterinary Medicine shall normally be six years.

A.5.2 The maximum period of full-time study for a Bachelor's degree or a Diploma, is the minimum full-time period of study for that Degree or Diploma plus two years.

A.6 MODULE STRUCTURE AND CODING

A.6.1 Modules are coded with three alpha codes denoting the field of study as well as the Department under which a module is offered, for example: AEC (Agricultural Economics), ASC (Animal Science), CSC (Crop Science), FAS (Fisheries & Aquatic Sciences)), FST (Food Science & Technology), IES (Integrated Environmental Science), WLM (Wildlife Management & Ecotourism) and BVM (Veterinary Medicine).

The three alpha codes are followed by four numeric codes denoting the following:

1st numeric code:	qualification type
2nd numeric code:	NQF level
3rd numeric code:	module size (module type)
4th numeric code:	semester in which the module is offered

A.7 FIELD ATTACHMENT REGULATIONS

A.7.1 Diploma students will be required to go for their Field Attachment after successful completion of their second year of study. Degree students will be required to go for their first Field Attachment after successful completion of their second year, whereas they will go for their second Field Attachment after successful completion of their third year.

A.7.2 Attached students should be punctual at all times, must keep and leave accommodation provided to them clean, and report any breakages and damages caused to properties to their site supervisors, as well as maintain a positive attitude towards others and their work.

A.7.3 Students are required to stay on duty till the last day of the attachment period. Failure to do so may result in the repetition of the attachment at student's own cost. Absence from the site of duty may only be authorized by the site management in writing. Weekends should be considered part of the attachment period, therefore students on attachment may be required to report for duty during weekends should the need arise.

A.7.4 Field Attachment will be assessed based on i) written attachment report and ii) an oral presentation.

A.8 ASSESSMENT

A.8.1 General Examination Regulations as set out in the General Information & Regulations Prospectus shall apply.

A.8.2 Unless otherwise stipulated in these regulations, module assessment for the diploma and undergraduate degree programmes will be as follows:

DIPLOMA PROGRAMMES

Continuous assessment mark will constitute a weighting of 60% of the final mark while examination will constitute a weighting of 40% of the final mark for modules consisting of lectures and practicals.

UNDERGRADUATE DEGREE PROGRAMMES

Continuous assessment mark will constitute a weighting of 40% of the final mark while examination will constitute a weighting of 60% of the final mark for modules consisting of lectures and practicals.

A.8.3 Continuous Assessment will include at least 2 written tests and 1 assignment, including practical reports.

A.8.4 Assessment descriptions for the BACHELOR OF VETERINARY MEDICINE is described in the modules descriptors under "L".

A.9. MINIMUM REQUIREMENTS FOR RE-ADMISSION INTO THE FACULTY

To be re-admitted into the Faculty, a student must have passed the minimum number of credits as indicated below by programms:

A.9.1 DIPLOMA IN AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

To be re-admitted into the DA and DNRM programmes, a student must have passed at least:

(a) 48 credits by the end of the 1st Year; of which 16 is non-Unam core;
(b) 128 credits by the end of the 2nd Year;
(c) 216 credits by the end of 3rd Year;
(d) 280 credits by the end of the 4th Year.

A.9.1 DIPLOMA IN ANIMAL HEALTH

To be re-admitted into the DAH programme, a student must have passed at least:

(a) 48 credits by the end of the 1st year of registration (of which at least 16 credits must be non-UNAM core)
(b) 128 credits at the end of the 2nd year of registration
(c) 240 credits at the end of the 3rd year of registration
(d) 320 credits at the end of the 4th year of registration

A.9.2 BACHELOR OF SCIENCE IN AGRICULTURE (AGRICULTURAL ECONOMICS) HONOURS

To be re-admitted into the BSc (AE) programme, a student must have passed at least:

(a) 56 credits by the end of the 1st Year, of which 16 is non-Unam core;
(b) 144 credits by the end of the 2nd Year;
(c) 248 credits by the end of the 3rd Year;
(d) 336 credits by the end of the 4th Year;
(e) 400 credits by the end of the 5th Year

A.9.3 BACHELOR OF SCIENCE IN AGRICULTURE (ANIMAL SCIENCE) HONOURS

To be re-admitted into the BSc (AS) programme, a student must have passed at least:

(a) 48 credits by the end of the 1st Year, of which 16 is non-Unam core;
(b) 144 credits by the end of the 2nd Year;
(c) 248 credits by the end of the 3rd Year;
(d) 352 credits by the end of the 4th Year;
(e) 416 credits by the end of the 5th Year.

A.9.4 BACHELOR OF SCIENCE IN AGRICULTURE (CROP SCIENCE) HONOURS

To be re-admitted into the BSc (CS) programme, a student must have passed at least:

(a) 56 credits by the end of the 1st Year, of which 16 is non-Unam core;
(b) 152 credits by the end of the 2nd Year;
(c) 256 credits by the end of the 3rd Year;
(d) 344 credits by the end of the 4th Year;
(e) 400 credits by the end of the 5th Year.

A.9.5 BACHELOR OF SCIENCE IN AGRICULTURE (FOOD SCIENCE & TECHNOLOGY) HONOURS

To be re-admitted into the BSc (FST) programme, a student must have passed at least:

(a) 56 credits by the end of the 1st Year, of which 16 is non-Unam core;
(b) 152 credits by the end of the 2nd Year;
(c) 248 credits by the end of the 3rd Year;
(d) 336 credits by the end of the 4th Year;
(e) 400 credits by the end of the 5th Year.

A.9.6 BACHELOR OF SCIENCE IN FISHERIES & AQUATIC SCIENCES (HONOURS)

To be re-admitted into the BSc (FAS) programme, a student must have passed at least:

(a) 48 credits by the end of the 1st Year, of which 16 is non-Unam core;
(b) 152 credits by the end of the 2nd Year;
(c) 256 credits by the end of the 3rd Year;
(d) 352 credits by the end of the 4th Year;
(e) 416 credits by the end of the 5th Year.

A.9.7 BACHELOR OF SCIENCE IN INTEGRATED ENVIRONMENTAL SCIENCE (HONOURS)

To be re-admitted into the BSc (IES) programme, a student must have passed at least:

(a) 48 credits by the end of the 1st Year, of which 16 is non-Unam core;
(b) 160 credits by the end of the 2nd Year;
(c) 256 credits by the end of the 3rd Year;
(d) 352 credits by the end of the 4th Year;
(e) 416 credits by then end of the 5th Year.

A.9.8 BACHELOR OF SCIENCE IN WILDLIFE MANAGEMENT & ECOTOURISM (HONOURS)

To be re-admitted into the BSc (WME) programme, a student must have passed at least:

(a) 48 credits by the end of the 1st Year, of which 16 is non-Unam core;
(b) 160 credit by the end of the 2nd Year;
(c) 256 credits by the end of the 3rd Year;
(d) 344 credits by the end of the 4th Year;
(e) 408 credits by the end of the 5th Year.

A.9.9 BACHELOR OF SCIENCE IN WILDLIFE MANAGEMENT & ECOTOURISM (HONOURS)

A.9.9.1 To be re-admitted into the BVM programme, a student must have passed at least:

(a) 104 credits by the end of the 1st Year;
(b) 208 credit by the end of the 2nd Year;
(c) 320 credits by the end of the 3rd Year;
(d) 392 credits by the end of the 4th Year;
(e) 488 credits by the end of the 5th Year;
(f) 584 credits by the end of the 6th Year;
(g) 682 credits by the end of the 7th Year;

A.9.9.2 Students who are not re-admitted into the BVM programme, may apply for transfer into other programmes in the Faculty of Agriculture and Natural Resources, provided that they meet the following minimum requirements for re-admission into the Faculty.

A.10 ACADEMIC ADVANCEMENT REGULATIONS

A student advances to the following academic year of study have to fulfill the following criteria as stated by programs below. In all cases, pre-requisites for modules have to be passed before a student can proceed to register for modules that require prerequisites.

A.10.1 DIPLOMA IN AGRICULTURE

A.10.1.1 First Year to Second Year

(a) To proceed to second year, a student must have passed at least 88 credits prescribed in first year (67% of the total 132 credits in first year).

(b) A student who has obtained at least 48 but less than 56 credits by the end of first year, shall not progress to the second year, but re-register for all outstanding modules in the first year. Such student will not register for any modules in the second year.

(c) A student who has obtained at least 56 credits but less than 88 credits by the end of first year shall repeat the first year, but will be allowed to register for a maximum of 48 credits in the 2nd year in addition to the failed modules provided that the relevant pre-requisites have been passed.

A.10.1.2 Second Year to Third Year

(a) To proceed to third year, a student must have passed all 132 credits prescribed in the first year, and at least 82 credits of second year (67% of the total 124 credits in second year).

(b) A student who has not cleared all first year modules by the end of the second year will not be allowed to register for any third year modules.

(c) A student who has passed all first year modules and obtained at least 48 but less than 80 credits in the second year shall repeat the second year, but will allowed to register for a maximum of 48 credits in the third year in addition to the failed modules provided that the relevant pre-requisites have been passed.

A.10.2 DIPLOMA IN NATURAL RESOURCES MANAGEMENT

A.10.2.1 First Year to Second Year

(a) To proceed to second year, a student must have passed at least 88 prescribed in the first year (67% of the total 132 credits in first year).

(b) A student who has obtained a minimum of 48 but less than 56 credits by the end of the first year, shall not progress to the second year, but re-register for all outstanding modules in the first year. Such student will not be allowed to register for any modules in the second year.

(c) A student who has obtained at least 56 credits but less than 88 credits by the end of the first year shall repeat the year, but will be allowed to register for a maximum of 48 credits in the 2nd year in addition to the failed modules provided that the relevant pre-requisites have been passed.

A.10.2.2 Second Year to Third Year

(a) To proceed to third year, a student must have passed all 132 credits prescribed in the first year, and at least 82 credits of second year (67% of the total 124 credits in second year).

(b) A student who has not cleared all first year modules by the end of the second year will not be allowed to register for any third year modules.

(c) A student who has passed all first year modules and obtained at least 48 but less than 80 credits in the second year shall repeat the second year, but will be allowed to register for a maximum of 48 credits in the third year in addition to the failed modules provided that the relevant pre-requisites have been passed.

A.10.3 BACHELOR OF SCIENCE IN AGRICULTURE (AGRICULTURAL ECONOMICS) HONOURS

A.10.3.1 First Year to Second Year

(a) To proceed to second year, a student must have passed at least 104 credits prescribed in the first year (67% of the total 152 credits in first year).

(b) A student who has obtained at least 56 but less than 64 credits by the end of the first year shall not progress to second year, but re-register for all outstanding first year modules. Such student will not be allowed to register for any modules in the second year.

(c) A student who has obtained at least 64 but less than 104 credits by the end of first year shall repeat the year, but will be allowed to register for a maximum of 48 credits in the 2nd year in addition to the failed modules provided that the relevant pre-requisites have been passed.

A.10.3.2 Second Year to Third Year

(a) To proceed to third year, a student must have passed at least 50% of the remaining first year credits, and at least 96 credits in the second year (75% of the total 120 credits in second year).

(b) A student who has obtained at least 48 but less than 56 second year credits shall repeat the second year and re-register for all outstanding modules. Such student will not be allowed to register for any modules in the third year.

(c) A student who has obtained at least 56 but less than 96 second year credits shall repeat the second year, but will be allowed to register for a maximum of 48 credits in the third year in addition to the failed modules of the second year provided that the relevant pre-requisites have been passed.

A.10.3.3 Third Year to Forth Year

(a) Proceed to fourth year, a student must have passed all first year modules, and at least 50% of the remaining second year credits. In addition, the student must have passed at least 104 third year credits (75% of the total 138 credits in third year).

A.10.4 BACHELOR OF SCIENCE IN AGRICULTURE (ANIMAL SCIENCE) HONOURS

A.10.4.1 First Year to Second Year

(a) To proceed to second year, a student must have passed at least 96 credits prescribed in the first year (67% of the total 136 credits in first year).

(b) A student who has obtained a minimum of 48 but less than 56 credits by the end of the first year shall not progress to second year, but re-register for all outstanding first year modules. Such student will not be allowed to register for any modules in the second year.

(c) A student who has obtained at least 56 credits but less than 96 credits by the end of first year shall repeat the year, but will be allowed to register for a maximum of 48 credits in the 2nd year in addition to the failed modules provided that the relevant pre-requisites have been passed.

A.10.4.2 Second Year to Third Year

(a) To proceed to third year, a student must have passed at least 50% of the remaining first year credits and at least 96 credits in the second year (75% of the total 128 credits in second year).

(b) A student who has obtained at least 48 but less than 56 second year credits shall repeat the second year and re-register for all outstanding modules. Such student will not be allowed register for any modules in the third year.

(c) A student who has obtained at least 56 but less than 96 second year credits shall repeat the second year, but will be allowed to register for a maximum of 48 credits in the third year in addition to the failed modules of the second year provided that the relevant pre-requisites have been passed.

A.10.4.3 Third Year to Forth Year

(a) To proceed to fourth year, a student must pass all first year modules, and at least 50% of the remaining second year credits. In addition, the student must have passed at least 104 third year credits (75% of the total 140 credits in third year).

A.10.5 BACHELOR OF SCIENCE IN AGRICULTURE (CROP SCIENCE) HONOURS

A.10.5.1 First Year to Second Year

(a) To proceed to second year, a student must have passed at least 104 credits prescribed in the first year (67% of the total 152 credits in first year).

(b) A student who has obtained at least 56 but less than 64 credits by the end of the first year shall not progress to second year, but re-register for all outstanding modules. Such student will not be allowed to register for nay modules in the second year.

(c) A student who has obtained at least 64 but less than 104 credits by the end of the first year shall repeat the year, but will be allowed to register for a maximum of 48 credits in the 2nd year in addition to the failed modules provided that the relevant pre-requisites have been passed.

A.10.5.2 Second Year to Third Year

(a) To proceed to third year, a student must have passed at least 50% of the remaining first year credits, and at least 104 credits in second year (75% of the total 132 credits in second year).

(b) A student who has obtained at least 48 but less than 56 second year credits shall repeat the year and re-register for all outstanding modules. Such student will not be allowed to register for any modules in the third year.

(c) A student who has obtained at least 56 but less than 104 second year credits shall repeat the year, but will be allowed to register for a maximum of 48 credits in the third year in addition to the failed modules of the second year provided that the relevant pre-requisites have been passed.

A.10.5.3 Third Year to Fourth Year

(a) To proceed to fourth year, a student must pass all first year modules and at least 50% of the remaining second year credits. In addition, the student must have passed at least 104 third year credits (75% of the total 136 credits in third year).

A.10.6 BACHELOR OF SCIENCE IN AGRICULTURE (FOOD SCIENCE & TECHNOLOGY) HONOURS

A.10.6.1 First Year to Second Year

(a) To proceed to second year, a student must have passed at least 104 credits prescribed in the first year (67% of the total 152 credits in first year).

(b) A student who has obtained a minimum of 56 but less than 64 credits by the end of the first year shall not progress to second year, but re-register for all outstanding modules in the first year. Such student will not be allowed to register for any modules in the second year.

(c) A student who has obtained at least 64 but less than 104 credits by the end of the first year shall repeat, but will be allowed to register for a maximum of 48 credits in the 2nd year in addition to the failed modules provided that the relevant pre-requisites have been passed.

A.10.6.2 Second Year to Third Year

(a) To proceed to third year, a student must have passed at least 50% of the remaining first year credits and at least 104 credits in second year (75% of the total 136 credits in second year).

(b) A student who has obtained at least 48 but less than 56 second year credits shall repeat the year and re-register for the outstanding modules. Such student will not be allowed to register for any modules in the third year.

(c) A student who has obtained at least 56 credits but less than 104 second year shall repeat the year, but will be allowed to register for a maximum of 48 credits in the third year in addition to the failed modules of the second year provided that the relevant pre-requisites have been passed.

A.10.6.3 Third Year to Fourth Year

(a) To proceed to fourth year, a student must pass all first modules and at least 50% of the remaining second year credits. In addition, the student must have passed at least 96 third year credits (75% of the total 122 credits in third year).

A.10.7 BACHELOR OF SCIENCE IN FISHERIES & AQUATIC SCIENCES (HONOURS)

A.10.7.1 First Year to Second Year

(a) To proceed to second year, a student must have passed at least 96 credits prescribed in the first year (67% of the total 136 credits first year).

(b) A student who has obtained at least 48 but less than 56 credits by the end of the first year shall not progress second year, but re-register for all outstanding modules in the first year. Such student will not be allowed to register for any modules in the second year.

(c) A student who has obtained at least 56 but less than 96 credits by the end of the first year shall repeat the year, but will be allowed to register for a maximum of 48 credits in the 2nd year in addition to the failed modules provided that the relevant pre-requisites have been passed.

A.10.7.2 Second Year to Third Year

(a) To proceed to third year, a student must have passed at least 50% of the remaining first year credits, and at least 112 credits in second year (75% of the total 144 credits in second year).

(b) A student who has obtained at least 48 but less than 56 second year credits by the end of the second shall repeat the year and re-register for all outstanding modules. Such student will not be allowed to register for any modules in the third year.

(c) A student who has obtained at least 56 but less than 112 second credits by the end of second year shall repeat the year, and will be allowed to register for a maximum of 48 credits in the third year in addition to the failed modules of the second year provided that the relevant pre-requisites have been passed.

A.10.7.3 Third Year to Fourth Year

(a) To proceed to fourth year, a student must pass all first year modules and at least 50% of the remaining second year credits. In addition, the student must have passed at least 104 credits in third year (75% of the total 132 credits in third year).

A.10.8 BACHELOR OF SCIENCE IN INTEGRATED ENVIRONMENTAL SCIENCE (HONOURS)

A.10.8.1 First Year to Second Year

(a) To proceed to second year, a student must have passed at least 96 credits prescribed in the first year (67% of the total 136 credits in first year).

(b) A student who has obtained at least 48 but less than 56 credits by the end of the first year shall not progress to second year, but re-register for all outstanding modules first year modules. Such student will not be allowed to register for any modules in the second year.

(c) A student who has obtained at least 56 but less than 96 second year credits shall repeat the year, but will be allowed to register for a maximum of 48 credits in the 2nd year in addition to the failed modules provided that the relevant pre-requisites have been passed.

A.10.8.2 Second Year to Third Year

(a) To proceed to third year, a student must have passed at least 50% of the remaining first year credits and at least 120 credits in second year (75% of the total 156 credits in second year).

(b) A student who has obtained at least 56 but less than 64 second year credits by the end of the second shall repeat the year and re-register for all outstanding modules. Such student will not be allowed to register for any modules in the third year.

(c) A student who has obtained at least 64 but less than 120 second year credits shall repeat the year, but will be allowed to register for a maximum of 48 credits in the third year in addition to the failed modules of the second year provided that the relevant pre-requisites have been passed.

A.10.8.3 Third Year to Fourth Year

(a) To proceed to fourth year, a student must pass all first year modules and at least 50% of the remaining second year credits. In addition, the student must have passed at least 96 third year credits (75% of the total 126 credits in year third).

A.10.9 BACHELOR OF SCIENCE IN WILDLIFE MANAGEMENT & ECOTOURISM (HONOURS)

A.10.9.1 First Year to Second Year

(a) To proceed to second year, a student must have passed at least 96 credits prescribed in the first year (67% of the total 136 credits in year 1).

(b) A student who has obtained at least 48 but less than 56 credits by the end of the first year shall not progress to second year, but re-register for all outstanding first year modules. Such student will not be allowed to register for any modules in the second year.

(c) A student who has obtained at least 56 but less than 96 credits by the end of first year shall repeat the year, but will be allowed to register for a maximum of 48 credits in the 2nd year in addition to the failed modules provided that the relevant pre-requisites have been passed.

A.10.9.2 Second Year to Third Year

(a) To proceed to third year, a student must have passed at least 50% of the remaining first year credits, and at least 112 credits of second year (75% of the total 148 credits in second year).

(b) A student who has obtained at least 48 but less than 56 second year credits by the end of the second year shall repeat the year and re-register for all outstanding modules in the first year. Such student will not be allowed to register for any modules in the third year.

(c) A student who has obtained at least 56 but less than 112 second year shall repeat the year, but will be allowed to register for a maximum of 48 credits in the third year in addition to the failed modules of the second year provided that the relevant pre-requisites have been passed.

A.10.9.3 Third Year to Fourth Year

(a) To proceed to fourth year, a student must pass all first year modules and at least 50% of the remaining second year credits. In addition, the student must have passed at least 96 third year credits (75% of the total 124 credits in third year).

A.10.10 BACHELOR OF SCIENCE IN VETERINARY MEDICINE (HONOURS)

A.10.10.1 First Year to Second Year

(a) To advance to the second year of the BVM programme a student must have passed all first year modules. However, a student who has passed at least 64 credits of the first year modules (but less than 128), will still be registered as a first year student. Such a student will be allowed to register for a maximum of 48 credits of the second year first semester modules (in addition to the failed modules) provided that:
   (i) the relevant pre-requisites have been passed and
   (ii) there are no time table clashes

A.10.10.2 Second Year to Third Year

(a) To advance to the third year of the BVM programme a student must have passed all first and second year modules. However, a student who has passed all first year modules and at least 64 (but less than 128) second year credits, will be registered as a second year student. Such a student will be allowed to register for a maximum of 48 third year credits over the year (in addition to the failed modules) provided that:
   (i) the relevant pre-requisites have been passed and
   (ii) there are no time table clashes

A.10.10.3 Third Year to Fourth Year

(a) To advance to the fourth year of the BVM programme a student must have passed all first, second and third year modules. A student who has passed all first and second year modules and passed less than 120 third year credits, will have to repeat all failed modules and will not be allowed to enroll for any fourth year modules. However, a student who has passed all first and second year modules as well as at least 120 third year credits will be registered as a third year student. Such a student will be allowed to enroll for a maximum of 48 fourth year credits over the year (in addition to the failed modules), provided that:
   (i) the relevant pre-requisites have been passed and
   (ii) there are no time table clashes

A.10.10.4 Fourth Year to Fifth year

(a) To advance to the fifth year of the BVM programme a student must have passed all first, second, third and fourth year modules. A student who has passed all first, second and third year modules and passed less than 120 fourth year credits, will have to repeat all failed modules and will not be allowed to enroll for any fifth year modules. However, a student who has passed all first, second and third year modules as well as at least 120 fourth year credits will be registered as a fourth year student. Such a student will be allowed to enroll for a maximum of 48 fifth year credits over the year (in addition to the failed modules), provided that:
   (i) the relevant pre-requisites have been passed and
   (ii) there are no time table clashes

A.10.10.5 Fifth year to the Sixth and final year

(a) To advance to the sixth and final year of the BVM programme a student must have passed all first, second, third, fourth and fifth year modules. A student will not be allowed to carry any modules over to the sixth year of study as this involves clinical rotations.

A.10.10.6 Sixth year

(a) A student will not be allowed to repeat the sixth year of study more than once. No student will be allowed to register for a module for which the approved pre-requisite was not met.

A.11 AWARDING OF DIPLOMAS AND DEGREES

A.11.1 To be awarded a diploma or degree a student shall be required to:

(i) Pass all modules taken in the programme;
(ii) Have completed and passed all field practical training courses.

A.11.2 The diploma or degree Certificate shall be classified in accordance with the provisions of the Academic General Regulations of the University of Namibia.

B. DIPLOMA IN AGRICULTURE (Ogongo Campus) [17HDAG]

B.1 PROGRAMME SCHEDULE

Course code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 1 Semester 1					
ULEG 2410	English for General Communication	4	16	C	
UCLC 3509	Computer Literacy	5	8	C	
UCSI 3580	Contemporary Social Issues	5	8	C	
AAEC 2411	Mathematics and Basic Statistics	4	16	C	
AASC 2431	Biology	4	16	C	
AACA 2400	Farm Duties I	4	8	C	
Total Credits Semester 1				72	
Year 1 Semester 2					
ULEG 2410	English for General Communication	4	16	C	
AAEC 2482	Basic Economics	4	12	C	
AASC 2432	Physical Science	4	16	C	
AASC 2422	Animal Anatomy, Physiology and Reproduction	4	8	C	
AACA 2400	Farm Duties I	4	8	C	
Total credits Semester 2				60	
TOTAL CREDITS YEAR 1				132	

Year 2 Semester 1					
AAEC 2541	Communication and Information Systems	5	8	C	None
AAEC 2501	Financial Management	5	8	C	None
AAEC 2521	Introduction to Rural Sociology	5	8	C	None
ACSC 2581	Soil Science	5	12	C	None
AASC 2551	Applied Animal Health	5	16	C	None
AACA 2500	Farm Duties II	5	8	C	None
Total Credits Semester 1				60	
Year 2 Semester 2					
ACSC 2582	Introduction to Research	5	12	C	AAEC 2411 (Mathematics & Basic Statistics)
ACSC 2522	Workshop technology, surveying and farm structures	5	8	C	AAEC 2411 Basic Math & Stats
ACSC 2532	Vegetable and Fruit Production	5	16	C	None
ACSC 2592	Crop Production	5	12	C	None
AASC 2502	Applied Animal Breeding	5	8	C	None
AACA 2500	Farm Duties II	5	8	C	None
Total credits Semester 2				64	
TOTAL CREDITS YEAR 2				124	

Year 3 Semester 1					
AACA 2600	Special Study	6	8	C	ACSC2582 (Introduction to Research)
AACA 2601	Field Attachment	6	8	C	None
AAEC 2641	Principles of Agricultural Extension	6	8	C	None
AAEC 2661	Agricultural Marketing and	6	8	C	None

	Policy				
AASC 2681	Intensive Animal Production	6	12	C	None
ACSC 2601	Water Management and Soil Conservation	6	8	C	ACSC 2581 (Soil Science)
AASC 2691	Range Management	6	12	C	None
Total Credits Semester 1			68		
Year 3 Semester 2					
AACA 2600	Special Study	6	8	C	ACSC2582 (Introduction to Research)
AAEC 2602	Project Management	6	8	C	None
AAEC 2622	Entrepreneurship	6	8	C	None
AASC 2622	Animal nutrition and Feeding	6	8	C	None
AASC 2602	Game Farming	6	8	C	None
AASC 2642	Extensive Animal Production	6	8	C	None
ACSC 2682	Farm Power and Machinery	6	12	C	AAEC 2411 (Basic Mathematics & Statistics)
ACSC 2622	Crop Protection	6	8	C	None
Total credits Semester 2			68		
TOTAL CREDITS YEAR 3			132		
TOTAL PRGOGRAMME CREDITS			388		

B.2 MODULE DESCRIPTORS

B.2.1 FIRST YEAR MODULES

ULEG 2410: ENGLISH FOR GENERAL COMMUNICATION

Module title: ENGLISH FOR GENERAL COMMUNICATION
Code: ULEG 2410
NQF Level: 4
Contact hours: 4 hours per week for 28 weeks
Credits: 32
Module Assessment: Continuous Assessment (60%): 4 reading tests, 4 writing tests, 2 oral presentations, 1 literature worksheet. Examination (40%): 1x3 hour paper
Pre-requisites: None
Module Content:
This module attempts to assist students to improve their general English proficiency. The main goal of this module is, therefore, to develop the reading, writing, listening, speaking and study skills of students in order for them to perform tasks in an academic environment. This module focuses on the skills students need to perform cognitive academic tasks in an academic environment and beyond.

CLC3509: COMPUTER LITERACY

Module title: COMPUTER LITERACY
Code: CLC3509
NQF level: 5
Contact hours: 1 lecture theory and 1 lecture practical per week for 14 weeks
Credits: 8
Module assessment: Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%
Prerequisites: University Entry
Module Content:
The aim of this module is to equip the students through hands-on experience with the necessary skills to use application software: word processing, spreadsheets, databases, presentations and communications. The objective is to increase student's productivity in both the education and later, the work environment. The module covers the following topics. Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system: File Management, working with multiple programs, using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge. Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the workbook.

Databases: creating tables, relationships, queries, forms and reports. Presentation software: slide layout and master, animations, auto-content wizard and templates. Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

CSI 3580 CONTEMPORARY SOCIAL ISSUES

Module Title:	CONTEMPORARY SOCIAL ISSUES
Code	CSI 3580
NQF Level	*5*
NQF Credits	*8*
Contact hours	Equivalent to 1 hour per week for 2 semesters (Online)
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1&2

Module Content:

The module, Contemporary Social Issues (CSI3580), is designed to encourage behavioural change among UNAM students and inculcate the primacy of moral reasoning in their social relations and their academic lives. In providing students with critical and analytical thinking the module enables students to grow and develop into well rounded citizens, capable of solving contemporary social challenges experienced in their communities and societies. The teaching of the module takes three dimensions: the intellectual, the professional and the personal dimensions. The intellectual dimension is fostered through engaging students with subject knowledge, independent learning and module assessment. The professional dimension, on the other hand, is fostered through exposing students to real life situations of case studies and practical exercises that draws attention to social issues that attract ongoing political, public and media attention and/or debate. Finally, the professional dimension is fostered through group work, online discussions and class participation.

AAEC 2411: MATHEMATICS AND BASIC STATISTICS

Module Title:	MATHEMATICS AND BASIC STATISTICS
Code	AAEC 2411
NQF Level	*4*
NQF Credits	*16*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 3 hour paper).
Contact hours	4 hours lectures per week; 3 hours tutorials alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

Numbers; Operations; Percentages; Conversion of fractions and decimals; Ratio; Rate; Proportion and scale; Algebraic representation and formulae; Equations; Indices; Measurements and conversion of units; Geometrical terms and relationships; Bearings; Tables and graphs in practical situations; Trigonometry; Basic statistics: Population and sampling; Probability sampling methods; Measures of central tendencies; Measures of dispersion: Frequency distribution (grouped and ungrouped) data; Probabilities; Regression and correlation; Analysis of variance (ANOVA); Presentation and interpretation of statistical results and information.

AASC 2431: BIOLOGY

Module Title:	BIOLOGY
Code	AASC 2431
NQF Level	*4*
NQF Credits	*16*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 3 hour paper)
Contact hours	4 hours per week lectures; 3 hours per week practicals for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory

Semester Offered 1

Module Content:
Chemical basis of life; Introductory structure of macromolecules and their functions Prokaryotic and eukaryotic cells; Overview of the five major kingdoms of organisms and Viruses; Basic plant and animal anatomy and physiology: Differences between plant and animal cells; Photosynthesis; Osmosis & diffusion, cell respiration, passive and active transport; Basic taxonomy, Basic concepts of Mendelian genetics: Cell cycle; Mitosis and Meiosis; Sexual and asexual reproduction; Introduction to ecology, ecosystems and communities; Naming of ecosystems and communities; Food chain and food web; Interrelationships among organisms.

AACA 2400: FARM DUTIES I

Module Title:	FARM DUTIES I
Code	AACA 2400
NQF Level	*4*
NQF Credits	*16*
Assessment Strategies	Pass or fail grade. Pass with more than 80 % attendance
Contact hours	One full day (7 hour day) alternating for 28 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1&2

Module Content:
During the first year, all Diploma students will undertake one full day (7 teaching hours) of farm duties every second week, for a total of 14 days during the year. These duties will be undertaken on campus farms at Ogongo, involving all activities undertaken at the two farms. The farm duties will be geared toward developing students' specific farming skills as tractor driving and implement operation, vehicle driving, artificial insemination and pregnancy diagnosis, pump and borehole maintenance, vegetable propagation methods, keeping computerization and analysis of farm and financial records, animal judging, fertilization and pesticide application, erosion and draft animal utilization. Forty-nine teaching hours per semester will be awarded for this work. Assessment will be based on attendance at duty stations, participating in and completion of tasks and attitudes towards work, as well as grading during specific courses that take place in the recess periods (e.g. Easter and, Winter and Spring).

AAEC2482: BASIC ECONOMICS

Module Title:	BASIC ECONOMICS
Code	AAEC2482
NQF Level	*4*
NQF Credits	*12*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	3 hours lectures and 2 hours practical per week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Definition and scope of economics and agricultural economics; Micro- and macro-economics; Economic systems; Factors influencing demand and supply of agricultural commodities; Elasticity of demand and supply; Price determination under different market structures; Production functions; Cost concepts; Optimal level of output and input use; Risk and uncertainty; Tools used in macroeconomic analysis: the theory, measurement, and determination of national income; taxation; employment and business cycles; the multiplier; fiscal policy, budget deficits, and the national debt; aggregate supply and aggregate demand; money, banking, and monetary policy; exchange rates and balance of payments accounts; and stabilization policy for unemployment and inflation, introduction to international trade and comparative advantage.

AASC 2432: PHYSICAL SCIENCE

Module Title:	PHYSICAL SCIENCE
Code	AASC 2432
NQF Level	*4*

NQF Credits	*16*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 3 hour paper)
Contact hours	*4* hours per week lectures; 3 hours practical for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Laboratory safety. Physical quantities and measurements –SI. Properties of matter; Atoms, elements, molecules & compounds; The Periodic Table; Chemical formulae; Covalent and ionic compounds; non-polar and polar molecules; Molecular and formula mass; Redox reactions; Moles and Molarity; Octet rule; Electronic bonding & orbitals; Lewis structures; Chemical reactions and equations; Balancing chemical equations; Stoichiometry; Acids and bases; pH & buffers; Solutions and Solubility; Structure and properties of water; Ionisation of water; Laws of motion, force, energy, work. Kinetic theory of gases; Gas laws, pressure; Basic electricity; Voltage, current, power, conductors, insulators. Thermodynamics and heat; conduction, radiation and convection.

AASC 2422: ANIMAL ANATOMY, PHYSIOLOGY AND REPRODUCTION

Module Title: ANIMAL ANATOMY, PHYSIOLOGY AND REPRODUCTION

Code	AASC 2422
NQF Level	*4*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 hours lectures per week; 3 hours practical alternate week for 14 weeks
Co-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Aims:

Module Content:
This module covers the following aspects: morphology and Function of the reproductive system, circulatory, respiratory, nervous, skeletal, and urinary and digestive systems of farm animals (ruminants, mono-gastric animals, and poultry), their anatomical and functional interrelationships. Practical classes which will involve the use of carcass dissections, examination of internal organs in dead animals, and the study of laboratory models, will help in the understanding of the anatomical structures and the interrelationship between organic systems. Artificial insemination will also be coved in this Module.

B.2.2 SECOND YEAR MODULES

AACA 2500: FARM DUTIES II

Module Title: FARM DUTIES II

Code	AACA 2500
NQF Level	*5*
NQF Credits	*16*
Assessment Strategies	Pass or fail grade. Pass with more than 80 % attendance
Contact hours	One full day (7 hour day) alternating for 28 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content:
During the second year, all Diploma students will undertake one full day (7 teaching hours) of farm duties every second week, for a total of 14 days during the year. These duties will be undertaken on campus farm Ogongo, involving all activities undertaken at the two farms. The farm duties will be geared toward developing students' specific farming skills as tractor driving and implement operation, vehicle driving, artificial insemination and pregnancy diagnosis, pump and borehole maintenance, vegetable propagation methods, keeping computerization and analysis of farm and financial records, animal judging, fertilization and pesticide application, erosion and draft animal utilization. Forty-nine

teaching hours per semester will be awarded for this work. Assessment will be based on attendance at duty stations, participating in and completion of tasks and attitudes towards work, as well as grading during specific courses that take place in the recess periods (e.g. Easter and, Winter and Spring).

AAEC 2541: COMMUNICATION AND INFORMATION SYSTEMS

Module Title: COMMUNICATION AND INFORMATION SYSTEMS

Code	AAEC 2541
NQF Level	*5*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 lecture hour per week and practical 2 hours alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Definition of concepts, Theory of communication; the nature and importance of communication; Source, Message Channel and Receiver (SMCRE) communication models; communication process; verbal and non-verbal modes communication; written communication: writing informative articles and pamphlets for farmers; communication methods; extension campaigns; organization of agriculture show; and farmers day; Oral communication: effective speaking; presentation and use of common types of audio visual aids ; Application of ICTs in agricultural development, Design and production of communication materials. Information sourcing; scientific writing, referencing and plagiarism; Managing conflict and negotiation skills

AAEC 2501: FINANCIAL MANAGEMENT

Module Title: FINANCIAL MANAGEMENT

Code	AAEC 2501
NQF Level	*5*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 lectures and 2 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Principles of financial Management; Budgeting and Record keeping; Risk management; Investment Analysis; Depreciation and Asset valuation; Financial Statements Analysis, Leasing and renting of equipment or assets; Income tax and Estate planning and legal aspects of borrowing and sources and terms of agricultural loans.

AAEC 2521: INTRODUCTION TO RURAL SOCIOLOGY

Module Title: INTRODUCTION TO RURAL SOCIOLOGY

Course Code	AAEC 2521
NQF Level	*5*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 hours lectures and 2 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Concepts of sociology and anthropology; the role of rural sociology in development; types of communities; leadership structure ; community based organisation (CBO); nongovernmental organisations (NGO); the social institution of communities; culture relativism; rural leadership, social change and rural development, indigenous knowledge ; rural poverty and wealth ranking;

characteristic of rural and urban communities ; rural urban migration and implication for rural development; gender roles and property right in agriculture ; Impact of HIV/AIDS on Agriculture development.

ACSC 2581: SOIL SCIENCE

Module Title: SOIL SCIENCE

Code	ACSC 2581
NQF Level	*5*
NQF Credits	*12*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	*3* hours lectures per week, 3 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Aims:

This module aims to develop the student's understanding of soil as a medium for plant growth.

Module Content:

Definition and importance of soil: mineral fraction, organic matter, soil water and air. Soil formation: types of rocks; processes of weathering. Soil physical and chemical properties: texture, density, porosity, soil aeration and temperature, structure, compaction, profile, water holding capacity, cation exchange capacity. Soil nutrients for plant growth: nutrient content and nutrient availability. Fertilizers: organic and inorganic. Soil water: movement and availability. Soil conditions: acidity, alkalinity, salinity. Soil types of Namibia. Agro-ecological zones of Namibia.

AASC 2551: APPLIED ANIMAL HEALTH

Module Title: APPLIED ANIMAL HEALTH

Code	AASC 2551
NQF Level	*5*
NQF Credits	*16*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 3 hour paper)
Contact hours	4 lectures per week; 3 hours practicals for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

Concepts of health and disease. Disease development and body response in livestock. Introduction to Bacteriology, Virology, Parasitology, Toxicology, Pharmacology and Epidemiology of Disease. Notifiable diseases coursed by bacteria, viruses, fungi and yeast. Congenital and environmental induced defects. Important economic and zoonotic diseases of domestic animals. Common diseases of cattle, sheep, goats, pigs and poultry in Namibia. Actual activities pertaining to animal health (Restraint of animals, clinical examination, specimen collection, hygiene and sanitation) as performed by veterinarian and technicians on the farm as well as manipulating laboratory techniques necessary for diagnosing diseases of domestic animals.

ACSC 2582: INTRODUCTION TO RESEARCH

Module Title: INTRODUCTION TO RESEARCH

Code	ACSC 2582
NQF Level	5
NQF Credits	*12*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	3 hours lectures per week; 3 hours practicals/tutorials alternate week for 14 weeks
Prerequisite	AAEC 2411 Mathematics and Basic Statistics
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Research process: research problem formulation, research objectives, hypothesis formulation, literature review, research methods. Work plans and budgets.. Basic statistical concepts: means, mode, median, standard deviations, coefficient of variation. Basic experimental designs: completely randomized, randomized complete block. Social Survey methods and planning and design of surveys and sampling (Simple random sample, cluster, multi-stage, and stratified); Questionnaire design, interview schedule, Organization of field work for social research work. Data collection methods, Individual/group Interviews.

ACSC 2522: WORKSHOP TECHNOLOGY, SURVEYING AND FARM STRUCTURES

Module Title: WORKSHOP TECHNOLOGY, SURVEYING AND FARM STRUCTURES	
Code	ACSC 2522
NQF Level	*5*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 hours lectures per week; 3 hours practical alternate week for 14 weeks
Prerequisite	AAEC 2411 Mathematics and Basic Statistics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Workshop safety, workshop materials, technical drawing. Workshop equipment. Joining and assembly of metal and nonmetals. Measurements. Types of surveys: baseline, basic, triangulation, planimeter. Area/Volume measurements; Instruments, procedures, booking method. Leveling methods: Longitudinal sections, contour grid. Positioning and orientation systems: geographical positioning system, gyroscope, prismatic, traverses. Farmstead planning. Plans and drawings. Construction materials. Building procedures and equipment. Structures for specific purposes: farmstead, livestock, crop storage, greenhouses. Building economics and standards: bills of quantities.

ACSC 2532: VEGETABLE AND FRUIT PRODUCTION

Module Title: VEGETABLE AND FRUIT PRODUCTION	
Code	ACSC 2532
NQF Level	*5*
NQF Credits	*16*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 3 hour paper)
Contact hours	4 hours lectures per week, 3 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Importance of vegetables and fruits. Types of vegetables: leafy, root, fruit vegetables and mushrooms; legumes, runner crops; exotic/indigenous vegetables. Environmental requirements, selection of suitable cultivars, establishment/vegetable nursery practices, management practices. Methods of weed, pest and disease control, harvesting and handling. Mushrooms: spawn production, vegetative growth and requirements, fruit body formation and requirements. Fruit tree nursery technology: soil sterilization and propagation methods. Major tropical and subtropical fruit species, indigenous fruit trees species and nuts: citrus, mangoes, pawpaw, grapes, peaches, figs, dates, guava, marula and macadamia nuts. Soil and climatic requirements, establishment, management practices. Harvesting, post-harvest cycle and post-harvest technology.

ACSC 2592: CROP PRODUCTION

Module Title: CROP PRODUCTION	
Code	ACSC 2592
NQF Level	*5*
NQF Credits	*12*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment) Examination 40% (1 x 2 hour paper)
Contact hours	3 hours lecture per week, 3 hours practical alternate week for 14 weeks

Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Crop environment in Namibia. Cropping systems, tillage and crop establishment. Fertilization and management practices. Choice of land for different crops. Environmental factors affecting crop choice: temperature, rainfall, solar radiation, photoperiodism. Time of planting; pre- and post-rain planting. Land preparation: aims, tillage systems conventional, minimum, conservation tillage. Review of tillage and cultivation equipment for large-scale and small-scale farmers. Seeding: factors affecting seed quality, seeding depth, seeding rate, plant population. Fertilizer application times and methods. Calculation of row and intra-row spacing and fertilizer rates. Cultural practices for weed control. Harvesting: physiological maturity and harvest maturity, harvest index. Cropping systems—monoculture, mixed culture and intercropping. Soil requirements, climatic requirements and management practice for cereals; legumes, fibre crops , oil seed crops, root and tuber crops.

AASC 2502: APPLIED ANIMAL BREEDING

Module Title: APPLIED ANIMAL BREEDING	
Code	AASC 2502
NQF Level	*5*
NQF Credits	8
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 lecture per week; 3 hours practicals alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Applications of population and quantitative genetics principles to the improvement of livestock and poultry. Principles of gene segregation and analysis. Concepts in population genetics including change in gene frequencies as the basis for livestock improvement by selection, Hardy-Weinberg equilibrium, forces that change gene frequencies are discussed. The module covers: Mendelian genetics; causes of variation, measures of variation, partitioning of variation into its causes; estimation of heritability; genotype x environment interactions; correlations between traits; principles of selection; genetic relationships. The practical application of the principles of selection are discussed emphasizing livestock performance recording and evaluation, methods of breed improvement by selection and utilization of different mating systems in beef cattle, dairy cattle, swine, sheep and goats. Breeding values and their application in industry breeding

B.2.3 THIRD YEAR MODULES

AACA 2600: SPECIAL STUDY

Module Title: SPECIAL STUDY	
Code	AACA 2600
NQF Level	6
NQF Credits	*16*
Contact hours	*32*
Prerequisite	
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content:
Students carry out a supervised study of a current topic in Agriculture and related fields. The course includes participation in meetings organized by the coordinator, work with a faculty advisor to develop a study, formulate hypotheses, design and carry out experiments and collect data and write a report. Students will make a presentation to other students of the research proposal and a final presentation of the results.

AACA 2601: FIELD ATTACHMENT

Module Title:	FIELD ATTACHMENT
Code	AACA 2601
NQF Level	6
Assessment Strategies	Assessment will consist of on-site inspection, a report by the field supervisor and a written report and oral presentation by the student.
Notional Hours	80
Contact hours	6 weeks
NQF Credits	8
Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content
Three periods of , in total, six (6) weeks of field attachment will be undertaken by all Diploma students in one summer recess period (two are available: between the 1st and 2nd year and again between 2nd and 3rd year) and the winter recess in the 2nd year to gain practical experience and hands-on skills in support of teaching. During these periods, the students will be attached to suitable community forests, research stations, extension units and agro-industries in a structured, pre-planned manner to ensure that the objectives of off-site training are attained. Students will be visited during their attachment on-site to check on the efficiency of attachment. Twenty-one lecture hours (2 credits at level 5) will be allocated to this course for oral presentations.

AAEC 2641: PRINCIPLES OF AGRICULTURAL EXTENSION

Module Title: PRINCIPLES OF AGRICULTURAL EXTENSION	
Code	AAEC 2641
NQF Level	*6*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 hours lectures and 2 hr practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Definition of extension and history of extension; role of agriculture extension worker; extension methods and nature of extension and development; the concept of adult learning; adoption and diffusion theory; opinion leaders and contact farmers; agricultural extension system and approaches: FSRE; group dynamics; establishing and strengthening farmer organisations and formation of new groups; Participatory Rural Appraisal (PRA) techniques; Theoretical perspective in extension program development, purpose and steps in planning process; Agriculture extension campaigns; Motivation theory (Maslow's Hierarchy of needs) plan of work coordination supervision and administration feedback and evaluation procedure

AAEC 2661: AGRICULTURAL MARKETING AND POLICY

Module Title: AGRICULTURAL MARKETING AND POLICY

Code NQF Level NQF	AAEC 2661
Credits Assessment	*6*
Strategies	*8* Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 lectures per week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory 1
Semester Offered	

Module Aims: The course introduces students to concepts and theory in agricultural marketing as well as marketing plans of agricultural commodities and the essentials trade and contemporary policy issues critical to economic performance and growth in today's dynamic and competitive environment

Module Content:
Introduction to marketing, marketing functions and systems, marketing agricultural products, determining prices of agricultural products, demand and supply elasticities of agricultural commodities, price fluctuations, marketing margins, marketing alternatives (auctions, commodity exchanges, futures and contract markets) and strategies, market structures, supply chain analysis (supply and demand chain, vertical and horizontal integration) of key agricultural commodities in Namibia. Introduction to policy formulation and analysis, the National Agricultural Policy, credit policy, input policy, environmental policy, food security policy.

AASC 2681: INTENSIVE ANIMAL PRODUCTION

Module Title: INTENSIVE ANIMAL PRODUCTION

Code	AASC 2681
NQF Level	6
NQF Credits	12
Assessment Strategies	Continuous Assessment: 60 % (2x assignments + 2 tests + at least 5 marked practicals); Exam: 40% (1 x 2 hr paper)
Contact hours	03 Lectuers hours / weel for 14 weeks; 03 Practical hours / weeks alternating
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Aims:
This course develops the students' understanding of pig, dairy and poultry production.

Module Content:
Pig production in Namibia, Pig breeds & production systems. The pig cycle and the management of pigs. Marketing, transportation and animal welfare. Pig slaughter and product quality, Processing, preservation and storage of animal products. The Namibian dairy industry. Breeds of dairy cattle & production systems. The production cycle and management of dairy cattle. Processing, preservation and storage of dairy products. Poultry production in Namibia; Poultry breeds & production systems; Poultry management. Marketing, transportation and animal welfare, Chicken slaughter and product quality, Processing, preservation and storage of animal products

ACSC 2601: WATER MANAGEMENT AND SOIL CONSERVATION

Module Title: WATER MANAGEMENT AND SOIL CONSERVATION

Code	ACSC 2601
NQF Level	*6*
Notional Hours	80
NQF Credits	*8*
Contact hours	2 lectures per week, 3 hours practical alternate weeks for 14 weeks
Prerequisite	ACSC 2581 Soil Science
Compulsory/Elective	Compulsory
Semester Offered	1

Module Aims:

This course develops a student's understanding of irrigation crop water requirements and the process of soil erosion.

Module content:
The hydrological cycle, water sources and quality, uses and requirements. Water harvesting and storage. Soil erosion and soil loss estimation. Wind erosion and control. Conservation agriculture. Social, economic and institutional factors in water management and soil conservation planning. Overview or irrigation in Namibia. Soil/plant/water relationships. Crop water requirements. Irrigation methods. Drainage of agricultural lands.

Assessment Strategies
Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)

AASC 2691: RANGE MANAGEMENT

Module Title: RANGE MANAGEMENT	
Code	AASC 2691
NQF Level	*6*
NQF Credits	*12*
Assessment Strategies	Continuous Assessment: 60% (2x assignments + 2 tests + at least 5 marked practicals); Exam: 40% (1 x2 hr paper)
Contact hours	3 lectures and 2 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module content:
Roles, basic terminologies & background information on rangelands; Namibian range types. Overview of the carrying capacity of Namibian range types and carrying capacity determination. Morphology and taxonomy of common range plants. Growth cycle of plants and plant & seed dormancy. Types of succession including pioneer, sub-climax and climax processes; Retrogression and die-back rate of selected range plants; Factors influencing succession; State & transition models. Animal-plant interactions on range. Plant adaptation to herbivory; Grazing systems & stocking rates. Continuous and rotational grazing. Range degradation: Bush encroachment, overgrazing, desertification and erosion. Range evaluation and monitoring; Range condition & trend assessment; integrated feed budgeting and fodder flow planning; introduction to cultivated pastures; conservation of forage: hay and silage, *in situ* conservation.

AAEC 2602: PROJECT MANAGEMENT

Module Title: PROJECT MANAGEMENT	
Code	AAEC 2602
NQF Level	*5*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 hours of lectures per week and 2 hour practical alternate week 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module content:
Project as a means of developing rural areas. The project cycle; project identification, situation analysis: problem tree analysis. Project review (technical, institutional and managerial); Project environment: social, political, financial economic, commercial, legal and gender. Project design techniques (logical framework); Project implementation, management structure and resources; Project monitoring; project evaluation, type of evaluation. Examples of projects, Namibian projects, level of planning. Projects in the context of the regional and national development plan.

AASC 2622: ANIMAL NUTRITION AND FEEDING

Module Title: ANIMAL NUTRITION AND FEEDING

Code	AASC 2622
NQF Level	*6*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 hours lectures per week; 3 hours practicals alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module content:
The chemical composition of feeds. The biochemistry of nutrients (carbohydrates, lipids, proteins, vitamins and micro- and macro-minerals), anti-nutrients and water. Nutrient standards (voluntary feed intake, crude protein, digestibility, metabolizable energy) and the nutrient requirement of animals. Feeds and feedstuffs (roughage, concentrates, supplements, feed additives, growth promotants and performance manipulants). Comparative digestion of feeds and absorption (diffusion & facilitated) of nutrients in ruminants and non-ruminants. Mineral and Vitamin Nutrition. On-farm processing of feeds. Feed formulation. Metabolic disorders.

AAEC 2622: ENTREPRENEURSHIP

Module Title: ENTREPRENEURSHIP

Code	AAEC 2622
NQF Level	*6*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 hours lectures and 2 hrs practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module content:
Management function; types of business organization. Human resource management in SMEs: labour requirement, recruitment, selection and induction, compensation and incentives, labour relations, dismissal and compliance with Labour Act; Entrepreneurship; Strategic management dimensions, strategy levels, decisions, risks and benefits; Strategic plan; The SWOT analysis, business environment, formulation of objectives and strategies, development of action plans and functional tactics and strategic control; components of feasibility study and business plan.

AASC 2602: GAME FARMING

Module Title: GAME FARMING

Code	AASC 2602
NQF Level	6
NQF Credits	8
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 hours per week lectures; 3 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module content:
Potentials and constraints of game ranching in Namibia. Identification, ecology and management of suitable game species in Namibia. Management of the game ranch. Wildlife ethology and its implication to wildlife management. Wildlife surveys. Wildlife management in conservancies, community forests and other land uses types. Future prospects of each land use. Human and wildlife conflicts: the concept, management of conflict, existing policies and regulations on human wildlife conflicts. Game population dynamics. Environment, production, financial and marketing management. Product diversity and quality control.

AASC 2642: EXTENSIVE ANIMAL PRODUCTION

Module Title: EXTENSIVE ANIMAL PRODUCTION

Code	AASC 2642
NQF Level	6
NQF Credits	8
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 hours lectures; 3 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module content:
Characteristics, requirements and constraints of extensive meat production systems in Namibia. Production systems. Breeds of beef cattle, mutton sheep and goats. Facilities and handling. Management: sexual activity and fertility, flock composition, management targets and calendar, herd health, diversification. Economics of and factors affecting extensive meat production in Namibia, including legal framework. Record keeping. Growth and development of muscle, fat and connective tissue. Muscle physiology and composition. Conversion of muscle to meat during slaughtering and processing. Meat quality and legal framework. Bio-security. Consumer concerns. Future prospects of the industry.

ACSC 2682: FARM POWER AND MACHINERY

Module Title: FARM POWER AND MACHINERY

Code	ACSC 2682
NQF Level	*6*
NQF Credits	*12*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	3 hours lecture per week; 3 hours practical alternate week for 14 weeks
Prerequisite	AAEC 2411 Mathematics and Basic Statistics
Compulsory/Elective	Compulsory
Semester Offered	1

Module content:
Animal Power in Namibia. Selection, training and maintenance of draft animals. Animal drawn implements. Internal combustion engines and maintenance. Transmission and other sub systems. Tractors operation and maintenance. Tillage: Primary secondary, conservation tillage equipment, Implement Types, their operation, calibration and maintenance Crop planting, fertilization and weed control, crop protection, harvesting and post-harvest equipment. Crop drying, storage, handling and processing equipment. Farm machinery management.

ACSC 2622: CROP PROTECTION

Module Title: CROP PROTECTION

Code	ACSC 2622
NQF Level	*6*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 hours lectures per week, 3 hours practical alternate week
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	*2*

Module content:
Definition of pests, diseases and weeds. Pests and diseases during production and storage. Importance of crop protection. Characteristics and classification of insects, fungi, bacteria, viruses and weeds. Common fungal, bacterial and viral plant diseases of Namibia. Common weeds of Namibia. Common insect pests of Namibia. Methods of crop protection and their application. Integrated pest management. Pesticide handling and safety. Crop protection legislation in Namibia and International guidelines.

C. DIPLOMA IN NATURAL RESOURCES MANAGEMENT (Ogongo Campus) [17HDNR]

C.1 PROGRAMME SCHEDULE

Course code	Course name	NQF Level	Credits	Compulsory(C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 1 Semester 1					
ULEG2410	English for General Communication	4	16	C	
UCLC3509	Computer Literacy	5	8	C	
UCSI 3580	Contemporary Social Issues	5	8	C	
AAEC 2411	Mathematics and Basic Statistics	4	16	C	
AASC 2431	Biology	4	16	C	
Total Credits Semester 1					64
Year 1 Semester 2					
ULEG 2410	English for General Communication	4	16	C	
AIES 2402	Nursery Management	4	8	C	
AIES 2422	Plant Taxonomy	4	8	C	
AIES 2442	General Ecology	4	8	C	
AAEC 2482	Basic Economics	4	12	C	
AASC 2432	Physical Science	4	16	C	
Total credits Semester 2					68
TOTAL CREDITS YEAR 1					132

Year 2 Semester 1					
AIES 2531	Introduction to Agroforestry	5	16	C	None
AIES 2551	Forest and Veld Fire Management	5	16	C	None
AAEC 2501	Financial Management	5	8	C	None
AAEC 2521	Introduction to Rural Sociology	5	8	C	None
AAEC 2541	Communication and Information Systems	5	8	C	None
ACSC 2581	Soil Science	5	12	C	None
Total Credits Semester 1					68
Year 2 Semester 2					
AIES 2582	Vegetation Assessment & Monitoring Techniques	5	12	C	None
AIES 2502	Plant Pathology	5	8	C	None
AIES 2542	Silviculture	5	8	C	AIES 2402 (Nursery Management)
AIES 2562	Applied Entomology	5	8	C	None
ACSC2582	Introduction to Research	5	12	C	AAEC 2411 (Basic Mathematics & Statistics)
ACSC2592	Crop Production	5	12	C	None
Total credits Semester 2					60
TOTAL CREDITS YEAR 2					128

Year 3 Semester 1					
AIES 2651	Natural Resources Policies and Administration	6	16	C	None
AIES 2671	Forest Products & Services	6	16	C	None

AAEC2641	Principles of Agricultural Extension	6	8	C	None
ACSC2601	Water Management and Soil Conservation	6	8	C	AACSC 2581 Soil Science
AACA2601	Field Attachment	6	8	C	None
AASC2600	Special Study	6	8	C	ACSC 2582 (Intro to Research)
Total Credits Semester 1					64
Year 3 Semester 2					
AIES 2632	Natural Resource Management	6	16	C	None
AIES 2652	Principles of Wildlife Management	6	16	C	None
AIES 2672	Economics of Natural Resources	6	16	C	None
AAEC2602	Project Management	6	8	C	None
A ASC2600	Special Study	6	8	C	AASC 2582 (Introduction to Research)
Total credits Semester 2					64
TOTAL CREDITS YEAR 3					128
TOTAL CREDITS FOR THE PROGRAMME					388

C.2 MODULE DESCRIPTORS

C.2.1 FIRST YEAR MODULES

ULEG 2410: ENGLISH FOR GENERAL COMMUNICATION

Module title: ENGLISH FOR GENERAL COMMUNICATION
Code: ULEG 2410
NQF Level: 4
Contact hours: 4 hours per week for 28 weeks
Credits: 32
Module Assessment: Continuous Assessment (60%): 4 reading tests, 4 writing tests, 2 oral presentations, 1 literature worksheet. Examination (40%): 1x3 hour paper
Pre-requisites: None
Module Content:
This module attempts to assist students to improve their general English proficiency. The main goal of this module is, therefore, to develop the reading, writing, listening, speaking and study skills of students in order for them to perform tasks in an academic environment. This module focuses on the skills students need to perform cognitive academic tasks in an academic environment and beyond.

CLC3509 COMPUTER LITERACY

Module title: COMPUTER LITERACY
Code: CLC3509
NQF level: 5
Contact hours: 1 lecture theory and 1 lecture practical per week for 14 weeks
Credits: 8
Module assessment: Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%
Prerequisites: University Entry
Module Content: The aim of this module is to equip the students through hands-on experience with the necessary skills to use application software: word processing, spreadsheets, databases, presentations and communications. The objective is to increase student's productivity in both the education and later, the work environment. The module covers the following topics. Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system: File Management, working with multiple programs, using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge. Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the workbook. Databases: creating tables, relationships, queries, forms and reports.

Presentation software: slide layout and master, animations, auto-content wizard and templates. Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

CSI 3580 CONTEMPORARY SOCIAL ISSUES

Module Title:	CONTEMPORARY SOCIAL ISSUES
Code	CSI 3580
NQF Level	*5*
NQF Credits	*8*
Contact hours	Equivalent to 1 hour per week for 2 semesters (Online)
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1&2

Module Content:

The module, Contemporary Social Issues (CSI3580), is designed to encourage behavioural change among UNAM students and inculcate the primacy of moral reasoning in their social relations and their academic lives. In providing students with critical and analytical thinking the module enables students to grow and develop into well rounded citizens, capable of solving contemporary social challenges experienced in their communities and societies. The teaching of the module takes three dimensions: the intellectual, the professional and the personal dimensions. The intellectual dimension is fostered through engaging students with subject knowledge, independent learning and module assessment. The professional dimension, on the other hand, is fostered through exposing students to real life situations of case studies and practical exercises that draws attention to social issues that attract ongoing political, public and media attention and/or debate. Finally, the professional dimension is fostered through group work, online discussions and class participation.

Assessment Strategies:

- Continuous flexible modes of assessment (100%).

The purpose of this evaluation is to assess whether the teaching of the course has resulted in the accomplishment of the aims of the course in each student. This evaluation is therefore focused on assessing the impact of the course in individual students. Various methods can be used: written tests, multiple choice quizzes, assignments or brief reports, case analyses, presentations, essays, or reflections upon a theme or topic. Students should be graded based on continuous flexible modes of assessment (100%), and the Course Coordinator in consultations with the lecturers shall select the same written tests, multiple choice quizzes, assignments or brief reports, case analyses, presentations, etc. that shall be given to the students throughout the year.

- **Profile or Student's File:**

It is required from each lecturer to keep proper profile or student's file where all the written assignments shall be kept. The student has the right of access to her/his profile during the Academic Year. At the end of the Academic Year the average percentage shall be work out based on the continuous flexible modes of assessment.

- Evaluation of the lecturer:

After completion of the course the teaching should be evaluated. Students shall be invited to provide feedback on the teaching of lecturer/lecturers. The purpose of this evaluation is to identify how the course and the teaching can be improved.

AAEC 2411: MATHEMATICS AND BASIC STATISTICS

Module Title: MATHEMATICS AND BASIC STATISTICS	
Code	AAEC 2411
NQF Level	*4*
NQF Credits	*16*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 3 hour paper)

Contact hours	4 hours lectures per week; 3 hours tutorials alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Numbers; Operations; Percentages; Conversion of fractions and decimals; Ratio; Rate; Proportion and scale; Algebraic representation and formulae; Equations; Indices; Measurements and conversion of units; Geometrical terms and relationships; Bearings; Tables and graphs in practical situations; Trigonometry; Basic statistics: Population and sampling; Probability sampling methods; Measures of central tendencies; Measures of dispersion: Frequency distribution (grouped and ungrouped) data; Probabilities; Regression and correlation; Analysis of variance (ANOVA); Presentation and interpretation of statistical results and information.

AASC 2431: BIOLOGY

Module Title: BIOLOGY

Code	AASC 2431
NQF Level	*4*
NQF Credits	*16*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 3 hour paper)
Contact hours	4 hours per week lectures; 3 hours per week practicals for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Chemical basis of life; Introductory structure of macromolecules and their functions Prokaryotic and eukaryotic cells; Overview of the five major kingdoms of organisms and Viruses; Basic plant and animal anatomy and physiology: Differences between plant and animal cells; Photosynthesis; Osmosis & diffusion, cell respiration, passive and active transport; Basic taxonomy, Basic concepts of Mendelian genetics: Cell cycle; Mitosis and Meiosis; Sexual and asexual reproduction; Introduction to ecology, ecosystems and communities; Naming of ecosystems and communities; Food chain and food web; Interrelationships among organisms.

AAEC2482: BASIC ECONOMICS

Module Title: BASIC ECONOMICS

Code	AAEC2482
NQF Level	*4*
NQF Credits	*12*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	3 hours lectures and 2 hours practical per week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Definition and scope of economics and agricultural economics; Micro- and macro-economics; Economic systems; Factors influencing demand and supply of agricultural commodities; Elasticity of demand and supply; Price determination under different market structures; Production functions; Cost concepts; Optimal level of output and input use; Risk and uncertainty; Tools used in macroeconomic analysis: the theory, measurement, and determination of national income; taxation; employment and business cycles; the multiplier; fiscal policy, budget deficits, and the national debt; aggregate supply and aggregate demand; money, banking, and monetary policy; exchange rates and balance of payments accounts; and stabilization policy for unemployment and inflation, introduction to international trade and comparative advantage.

AASC 2432: PHYSICAL SCIENCE

Module Title: PHYSICAL SCIENCE

Code	AASC 2432
NQF Level	*4*
NQF Credits	*16*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 3 hour paper)
Contact hours	*4* hours per week lectures; 3 hours practical for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

Laboratory safety. Physical quantities and measurements –SI. Properties of matter; Atoms, elements, molecules & compounds; The Periodic Table; Chemical formulae; Covalent and ionic compounds; non-polar and polar molecules; Molecular and formula mass; Redox reactions; Moles and Molarity; Octet rule; Electronic bonding & orbitals; Lewis structures; Chemical reactions and equations; Balancing chemical equations; Stoichiometry; Acids and bases; pH & buffers; Solutions and Solubility; Structure and properties of water; Ionisation of water; Laws of motion, force, energy, work. Kinetic theory of gases; Gas laws, pressure; Basic electricity; Voltage, current, power, conductors, insulators. Thermodynamics and heat; conduction, radiation and convection

AIES 2402: NURSERY MANAGEMENT

Module Title: NURSERY MANAGEMENT

Code	AIES 2402
NQF level	4
NQF Credits	8
Assessment strategies	Continuous assessment 60% (minimum 2 tests, 2 assignments, 5 assessed practicals); Examination 40% (1 x 2 hour theory paper).
Contact hours	2 hours of lectures per week, 3 h practicals alternate week
Prerequisites	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content

Introduction to silviculture. Forest nurseries. Types of forest nurseries: permanent, temporary, satellite and flying nurseries. Selection of nursery site. Seedlings growing media. Seed technology: history of seed production, forecasting seed yield, seed collection and extraction, seed testing, computation of seeds requirements and seed storage. Seed sowing. Vegetative propagation: definition, types and techniques of vegetative propagation. Nursery tending operation. Nursery protection. Seedling distribution. Nursery records. Nursery planning, work organization and administration.

AIES 2422: PLANT TAXONOMY

Module Title: PLANT TAXONOMY

Code	AIES 2422
NQF level	5
NQF Credits	8
Assessment strategies	Continuous assessments 60% (minimum 2 tests, 4 assessed practical and 1 assignment); Examination 40% (1 x 2 hour theory paper).
Contact hours	2 hours of lectures per week, 3 h practicals per week
Prerequisites	General Biology
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:

Introduction to botanical concepts and plant anatomy. Plant taxonomy; classification and nomenclature. Plants identification; trees, shrubs and herbs. Botanical keys; types and use. Major plant families in Namibia and Specimen collection; Fabaceae (3 sub-families), Euphorbiaceae, Rubiaceae, Combretaceae.

AIES2442: GENERAL ECOLOGY

Module Title: GENERAL ECOLOGY	
Code	AIES2442
NQF level	4
NQF Credits	8
Assessment strategies	Continuous assessments 60% (Minimum 2 tests, 3 practical, 1 assignment); Examination 40% (1x2 hour theory paper).
Contact hours	2 hours of lectures per week, 3 h practicals alternate week
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Introduction to ecology: Concepts of ecology. Ecosystems of arid zones: terrestrial, freshwater and marine. Biomes of Southern Africa: physical and climatic characteristics. Constituents of the ecosystem: Biotic and abiotic components. Nutrient cycles: Food chain, Nitrogen cycle, Phosphorus cycle and carbon cycle. Plant succession and ecosystem disturbance. Ecosystem maintenance/conservation.

C.2.2 SECOND YEAR MODULES

AIES2531: INTRODUCTION TO AGROFORESTRY

Module Title: INTRODUCTION TO AGROFORESTRY	
Code	AIES2531
NQF level	5
NQF Credits	16
Assessment strategies	Continuous assessments 60% (2 tests, 4 practical reports, and 2 assignments); Examination 40% (1 x 3 hours paper).
Contact hours	4 hours of lectures per week, 3 hours of practicals per week
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
Introduction to agroforestry: Definition and principles of agroforestry, integrated land-use system, need for agroforestry, cause and consequences of deforestation. Multi-purpose tree species and their uses. Agroforestry systems. Agroforestry establishment techniques; ecological and economic interactions. Indigenous fruit trees. Agroforestry project work. Principles of beekeeping: biology of honeybees, beekeeping management, honey and other bee products. Crop pollination, bee diseases, parasites and poisoning of honeybees and their control.

AIES2551: FOREST AND VELD FIRE MANAGEMENT

Module Title: FOREST AND VELD FIRE MANAGEMENT	
Code	AIES2551
NQF level	6
NQF Credits	16
Assessment strategies	Continuous assessment 60% (minimum 2 tests, 1 assignment, 2 graded practical, 1 field trip report, 1 fire management plan). Examination 40% (1 x 3 hourstheory paper).
Contact hours	4 hours of lectures per week, 3 hours practicals per week
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
Introduction to veld and forest fires: definition of veld and forest fires, significance of veld and forest fires in savanna management, Forest fire and the environment: causes of fires, types of fires, effects of fire, forest fuels, fire behaviour, fire danger rating system, rate of spread, parts of veld and forest fire, classification of veld and forest fires. Fire prevention: community participation in fire prevention, early controlled burning, principles of fire breaks and fire break maintenance, fire protection plan. Fire detection: general detection, organized detection, fire lookout personnel, communication. Fire suppression: Tools, equipment and techniques, phases of fire suppression tactics, basic rules of fire

suppression tactics, methods of fire attack, factors affecting choice of attack, principle techniques for fire line construction, fire reports and records. Uses of fire in forest and range management: protective tool, land clearing, grazing, other uses. Fire control organization: functions of fire control section, personnel and their specific duties, the Government and other stakeholders. Safety and survival methods: general safety measures, accident prevention, fire fighting safety rules, dangerous situations, welfare of the fire fighting crew.

AAEC 2521: INTRODUCTION TO RURAL SOCIOLOGY

Module Title: INTRODUCTION TO RURAL SOCIOLOGY

Code	AAEC 2521
NQF Level	*5*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 hours lectures and 2 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Concepts of sociology and anthropology; the role of rural sociology in development; types of communities; leadership structure ; community based organisation (CBO); nongovernmental organisations (NGO); the social institution of communities; culture relativism; rural leadership, social change and rural development, indigenous knowledge ; rural poverty and wealth ranking; characteristic of rural and urban communities ; rural urban migration and implication for rural development; gender roles and property right in agriculture ; Impact of HIV/AIDS on Agriculture development.

AAEC 2541: COMMUNICATION AND INFORMATION SYSTEMS

Module Title: COMMUNICATION AND INFORMATION SYSTEMS

Code	AAEC 2541
NQF Level	*5*
NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours	2 lecture hour per week and practical 2 hours alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Definition of concepts, Theory of communication; the nature and importance of communication; Source, Message Channel and Receiver (SMCRE) communication models; communication process; verbal and non-verbal modes communication; written communication: writing informative articles and pamphlets for farmers; communication methods; extension campaigns; organization of agriculture show; and farmers day; Oral communication: effective speaking; presentation and use of common types of audio visual aids ; Application of ICTs in agricultural development, Design and production of communication materials. Information sourcing; scientific writing, referencing and plagiarism; Managing conflict and negotiation skills.

AAEC 2501: FINANCIAL MANAGEMENT

Module Title: FINANCIAL MANAGEMENT

Code	AAEC 2501
NQF Level	*5*

NQF Credits	*8*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment): Examination 40% (1 x 2 hour paper)
Contact hours	2 lectures and 2 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Principles of financial Management; Budgeting and Record keeping; Risk management; Investment Analysis; Depreciation and Asset valuation; Financial Statements Analysis, Leasing and renting of equipment or assets; Income tax and Estate planning and legal aspects of borrowing and sources and terms of agricultural loans.

ACSC 2581: SOIL SCIENCE

Module Title: SOIL SCIENCE	
Code	ACSC 2581
NQF Level	*5*
NQF Credits	*12*
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment): Examination 40% (1 x 2 hour paper)
Contact hours	*3* hours lectures per week, 3 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Definition and importance of soil: mineral fraction, organic matter, soil water and air. Soil formation: types of rocks; processes of weathering. Soil physical and chemical properties: texture, density, porosity, soil aeration and temperature, structure, compaction, profile, water holding capacity, cation exchange capacity. Soil nutrients for plant growth: nutrient content and nutrient availability. Fertilizers: organic and inorganic. Soil water: movement and availability. Soil conditions: acidity, alkalinity, salinity. Soil types of Namibia. Agro-ecological zones of Namibia.

AIES2582: VEGETATION ASSESSMENT AND MONITORING TECHNIQUES

Module Title: VEGETATION ASSESSMENT AND MONITORING TECHNIQUES	
Code	AIES2582
NQF level	5
NQF Credits	12
Assessment strategies	Continuous assessments 60% (minimum 2 tests, 3 assessed practical, 1 inventory report); Examination 40% (1x2 hour theory paper).
Contact hours	3 hours of lectures per week, 2 hour practicals per week
Prerequisites	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Introduction to vegetation assessments and inventory. Vegetation assessment: sampling: line transects, plot sampling: circular plots and quadrats; diversity indices; designs; result reporting. Forest mensuration systems, concepts and models. Tree measurement: measurement and computation of tree characteristics. Stand measurement. Inventories in large forest areas: Use Natural resource assessment methods to quantify and monitor changes in natural resources; Introduction to the use of Geographic Information System (GIS) tool for natural resource assessment.

AAIES 2502: PLANT PATHOLOGY

Module Title: PLANT PATHOLOGY	
Code	AAIES 2502
NQF level	5
Contact hours	2 hour of lectures per week, 3 hour practicals alternate week

NQF Credits	8
Assessment strategies	Continuous assessments 60% (Minimum 2 tests, 4 graded practical reports, and 2 assignments). Examination 40% (1 x 2 hours paper).
Prerequisites	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Introduction to Plant Pathology. Non-infectious agents: Biology and diseases. Infectious agents: Biology and diseases. Concept of disease development. Disease identification. Diseases caused by fungi, bacteria and viruses. Common plant diseases in Namibia. Beneficial microorganisms.Disease prevention and control (management practices). Plant diseases and trading of plants and plant products.

AIES2542: SILVICULTURE

Module Title: SILVICULTURE

Code	AIES2542
NQF level	5
NQF Credits	8
Assessment strategies	Continuous assessments 60% (2 tests, 4 practical reports, and 2 assignments; Examination 40% (1 x 3 hours paper).
Contact hours	2 hour of lectures per week, 3 hour practicals alternate week
Prerequisites	AIES 2402: Nursery Management
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Introduction: definitions and concepts, importance of establishing and tending of trees and forests. Land preparation methods. Forest establishment techniques. Weeding operations. Pruning operation. Thinning operation: reasons for thinning, thinning intensity and timing, thinning regimes, methods of thinning. Introduction to silvicultural systems: forms and composition of stands. Factors affecting the selection of a silvicultural system. Indigenous knowledge methods and their role in tending and management of indigenous trees and forests for better growth.

Module Title: APPLIED ENTOMOLOGY

Code	AIES 2562
NQF level	6
NQF Credits	8
Contact hours	2 hour of lectures per week, 3 hour practicals alternate week
Prerequisites	
Compulsory/Elective	Compulsory
Semester offered	2

Module Content
Introduction to Applied Entomology. General insect biology. Insect classification. Insects as pests. Assessment of insect population dynamics. Damage caused by insects/pests. Insects/pests in Namibian Forests. Beneficial insects. Preventive and control measures. Integrated pest management. Pests and trading of plants and plant products.

Assessment strategies
Continuous assessments 60% (Minimum 2 tests, 3 graded practical, and 1 assignment); Examination 40% (1 x 2 hour theory paper)

Module Title: INTRODUCTION TO RESEARCH

Code	ACSC 2582
NQF Level	5
NQF Credits	*12*

Contact hours	3 hours lectures per week; 3 hours practicals/tutorials alternate week for 14 weeks
Prerequisite	AAEC 2411 Mathematics and Basic Statistics
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Research process: research problem formulation, research objectives, hypothesis formulation, literature review, research methods. Work plans and budgets.. Basic statistical concepts: means, mode, median, standard deviations, coefficient of variation. Basic experimental designs: completely randomized, randomized complete block. Social Survey methods and planning and design of surveys and sampling (Simple random sample, cluster, multi-stage, and stratified); Questionnaire design, interview schedule, Organization of field work for social research work. Data collection methods, Individual/group Interviews.

Assessment Strategies
Continuous assessment 60% (minimum 2 tests and 1 assignment): Examination 40% (1 x 2 hour paper)

Module Title: CROP PRODUCTION

Code	ACSC 2592
NQF Level	*5*
NQF Credits	*12*
Contact hours	3 hours lecture per week, 3 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Crop environment in Namibia. Cropping systems, tillage and crop establishment. Fertilization and management practices. Choice of land for different crops. Environmental factors affecting crop choice: temperature, rainfall, solar radiation, photoperiodism. Time of planting; pre- and post-rain planting. Land preparation: aims, tillage systems—conventional, minimum, conservation tillage. Review of tillage and cultivation equipment for large-scale and small-scale farmers. Seeding: factors affecting seed quality, seeding depth, seeding rate, plant population. Fertilizer application times and methods. Calculation of row and intra-row spacing and fertilizer rates. Cultural practices for weed control. Harvesting: physiological maturity and harvest maturity, harvest index. Cropping systems—monoculture, mixed culture and intercropping. Soil requirements, climatic requirements and management practice for cereals; legumes, fibre crops , oil seed crops, root and tuber crops.

Assessment Strategies
Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)

C.2.3 THIRD YEAR MODULES

Module Title: NATURAL RESOURCE POLICIES AND ADMINISTRATION

Code	AAIES2651
NQF level	6
NQF Credits	16
Contact hours	4 hour of lectures per week, 3 hour practicals alternate week
Prerequisites	
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Definition of terms: Principal legislation, Subsidiary legislation, Act, policy, law, work plan. Objectives and strategies of formulating the policy. Introduction to the provisions of natural resources policies, laws and international conventions (emphasis Nature Conservation Act, Mining, Forest Act, Environmental Management Act and land reform acts; UN Conventions relating to natural resource conservation). Provision of natural resource regulations and procedures. Natural Resource policies and politics: Case studies from Namibia. Indigenous laws of Namibia related to environment conservation.

Assessment strategies
Continuous assessments 60% (minimum of 2 tests, 2 practical reports, and 2 assignments); Examination 40% (1 x 3 hours theory paper).

Module Title: FOREST PRODUCTS AND SERVICES

Code	AAIES 2671
NQF level	6
NQF Credits	16
Contact hours	4 hours of lectures per week, 3 hours practicals per week
Prerequisites	
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
INTRODUCTION: definitions of forests and related landscapes, wood forest products, non-wood forest products (NWFPs) and services; Contribution of forest products and services to local, national and international economy and trade.
FOREST PRODUCTS: Wood products harvesting techniques, extraction methods and processing in Namibia and in the world with special references to wood products in Namibia such as (fuelwood, charcoal and other wood energy, industrial round wood, sawn wood, pulpwood, particles and other industrial roundwood, fencing and other construction poles, handcrafts and traditional implements); Factors affecting harvesting, transportation system and processing of wood products (economic, social, political and environmental). Consumption rate of selected forest products (fuel wood, poles, etc)
NON-WOOD FOREST PRODUCTS (NWFPs): Contribution to household economy, local economy and food security (animal origin (food, medicine), plant origin (food and medicine), handcrafts, fodder); Factors affecting the development of indigenous natural products (INPs) and trade; Utilization and value addition of selected INPs (Devil's claw, marula fruit, hoodia plant, melons seed, *Ximenia* fruit, etc)
FOREST SERVICES: Eco-tourism, recreation, spiritual and cultural uses; Environmental services: environmental protection of fragile ecosystems (drylands and uplands), combating desertification, watershed management, climate change (carbon sequestration), and biodiversity conservation.

Assessment strategies
Continuous assessments 60% (Minimum of 2 tests, 4 graded practical reports, and 2 assignments); Examination 40% (1 x 3 hours theory paper).

Module Title: WATER MANAGEMENT AND SOIL CONSERVATION

Code	ACSC 2601
NQF Level	*6*
NQF Credits	*8*
Contact hours	2 hours lectures per week, 3 hours practical alternate weeks for 14 weeks
Prerequisite	ACSC 2581 Soil Science
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The hydrological cycle, water sources and quality, uses and requirements. Water harvesting and storage. Soil erosion and soil loss estimation. Wind erosion and control. Conservation agriculture. Social, economic and institutional factors in water management and soil conservation planning. Overview or irrigation in Namibia. Soil/plant/water relationships. Crop water requirements. Irrigation methods. Drainage of agricultural lands.

Assessment Strategies
Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper).

Module Title: PRINCIPLES OF AGRICULTURAL EXTENSION

Code	AAEC 2641
NQF Level	*6*
NQF Credits	*8*
Contact hours	2 hours lectures and 2 hours practical alternate week for 14 weeks

Prerequisite None
Compulsory/Elective Compulsory
Semester Offered 1

Module Content:
Definition of extension and history of extension; role of agriculture extension worker; extension methods and nature of extension and development; the concept of adult learning; adoption and diffusion theory; opinion leaders and contact farmers; agricultural extension system and approaches: FSRE; group dynamics; establishing and strengthening farmer organisations and formation of new groups; Participatory Rural Appraisal (PRA) techniques; Theoretical perspective in extension program development, purpose and steps in planning process; Agriculture extension campaigns; Motivation theory (Maslow's Hierarchy of needs) plan of work coordination supervision and administration feedback and evaluation procedure

Assessment Strategies
Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)

Module Title: FIELD ATTACHMENT
Code AACA 2601
NQF Level 6
NQF Credits *8*
Contact hours 6 weeks
Prerequisite None
Compulsory/Elective Compulsory
Semester Offered 1

Module Content:
Three periods of , in total, six (6) weeks of field attachment will be undertaken by all Diploma students in one summer recess period (two are available: between the 1st and 2nd year and again between 2nd and 3rd year) and the winter recess in the 2nd year to gain practical experience and hands-on skills in support of teaching. During these periods, the students will be attached to suitable community forests, research stations, extension units and agro-industries in a structured, pre-planned manner to ensure that the objectives of off-site training are attained. Students will be visited during their attachment on-site to check on the efficiency of attachment. Twenty-one lecture hours (2 credits at level 5) will be allocated to this course for oral presentations.

Assessment Strategies
Assessment will consist of on-site inspection, a report by the field supervisor and a written report and oral presentation by the student.

Module Title: SPECIAL STUDY
Code AACA 2600
NQF Level 6
NQF Credits *16*
Contact hours 2 hours per week for 28 weeks
Prerequisite ACSC 2582: Introduction to Research
Compulsory/Elective Compulsory
Semester Offered 1 and 2

Moduler Content:
Students carry out a supervised study of a current topic in Agriculture and related fields. The course includes participation in meetings organized by the coordinator, work with a faculty advisor to develop a study, formulate hypotheses, design and carry out experiments and collect data and write a report. Students will make a presentation to other students of the research proposal and a final presentation of the results.

Assessment Strategies
Research proposal write-up (20 %), presentation of the research proposal in seminar (10 %), presentation of empirical findings in a second seminar (10%), and final report (60 %).

Module Title: NATURAL RESOURCES MANAGEMENT
Code AAIES 2632

NQF level	6
NQF Credits	16
Contact hours	4 hours of lectures per week, 3 hours practicals per week
Prerequisites	
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Introduction: definition and approaches; community, natural resources, resource integration and planning. Rural development and rural livelihood strategies. Natural resource management; Processes and procedures for community forestry, conservancy initiative formations. Policy and strategy frames relevant to community forestry and conservancies; Conflict management over natural resource use. Integrated natural resource management plan; concept and approaches, components and their interactions (land, water, forests, water, non-wood products and services). Methods and processes for integrated natural resource management plan formulation for water, rangelands and forests. Evaluation and monitoring methods for integrated natural resource management plan.

Assessment strategies
Continuous assessments 60% (minimum 2 tests, 4 practical reports, and 2 assignments); Examination 40% (1 x 3 hours theory paper).

Module Title: PRINCIPLES OF WILDLIFE MANAGEMENT

Code	AAIES 2652
NQF level	6
NQF Credits	16
Contact hours	4 hours of lectures per week, 3 hours practicals per week
Prerequisites	None
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
An introduction to basic principles used in the management of wildlife populations, their habitats and their human users. General concepts in: ecological processes; population dynamics and structure; sampling in wildlife; life history patterns, biotic and abiotic factors structuring wildlife populations and endangered species. Home range and territoriality; coloniality; mating systems; hierarchy. Response of wildlife to humans.Plant-herbivore system. Herbivore-carnivore system. Predation of domestic animals by wild animals. Nutritional ecology (anatomy and physiology; feeding ecology; diet composition and analysis; nutritional value of plants; plant chemicals and toxins; management of toxic plants and affected game; grazing and browsing capacity; mineral deficiencies and supplementary feeding; nutrition in captivity).Animals and their characteristics. Management techniques of wildlife. Rangeland management (principles And practices; inter-relationships between plant species, common range plants, cultivated pastures and fodders). Survey & Monitoring Techniques: atlasing, mapping method, line transect method, point count method, trap-retrap method; biases and errors; environmental variables.

Assessment strategies
Continuous assessment: 60% (at least three assessments); Exam: 40% (1 x 3 hr paper)

Module Title: ECONOMICS OF NATURAL RESOURCES

Code	AAIES2672
NQF level	6
NQF Credits	16
Contact hours	4 hours of lectures per week, 3 hours practicals alternate week
Prerequisites	AAEC 2482: Basic Economics
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Introduction of natural resources economics. Classification of resources. Review of economic principles: scarcity. opportunity and environmental cost, costs of production, types of capital in relation to natural resources., price formation, capital and interest, depreciation. Economic analysis: Investment analysis, productivity, economic efficiency, uncertainty. Economic valuation of natural resources products and

services; valuation techniques and surrogate markets; natural resources contribution to the national economy.

Assessment strategies
Continuous assessments 60% (minimum of 2 tests, 4 practical reports, and 2 assignments); Examination 40% (1 x 2 hours theory paper).

Module Title: PROJECT MANAGEMENT

Code	AAEC 2602
NQF Level	*5*
NQF Credits	*8*
Contact hours	2 hours of lectures per week and 2 hour practical alternate week 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Project as a means of developing rural areas. The project cycle; project identification, situation analysis: problem tree analysis. Project review (technical, institutional and managerial); Project environment: social, political, financial economic, commercial, legal and gender. Project design techniques (logical framework); Project implementation, management structure and resources; Project monitoring; project evaluation, type of evaluation. Examples of projects, Namibian projects, level of planning. Projects in the context of the regional and national development plan.

Assessment Strategies
Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)

D. DIPLOMA IN ANIMAL HEALTH (17HDAH) – Katima Mulilo Campus

D.1 PROGRAMME SCHEDULE

YEAR 1 (144 CREDITS)
Semester 1

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
LEG 2410	English for General Communication	4	04/56	0	16		
CSI 3580	Contemporary Social Issues	5	01/14	0	4		
CLC 3509	Computer Literacy	5	02/28	0	8		
DAH 2401	Fundametals of Physical Sciences	4	02/28	21	8		
DAH 2411	Principles of Biology	4	04/56	42	16		
DAH 2431	Applied Mathematics and Basic Statistics	4	04/56	28	16		
Total semester 1 credits:					68		

Semester 2

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
LEG 2410	English for General Communication	4	04/56	0	16		
CSI 3580	Contemporary Social Issues	5	01/14	0	4		
DAH 2402	Veterinary Paraprofessional Skills	4	02/28	0	8		
DAH2412	Animal Anatomy I	4	04/56	42	16		
DAH 2432	Animal Physiology I	4	04/56	0	16		
DAH 2452	Basic Animal Behaviour, Handling and Welfare	4	04/56	21	16		
Total Semester 2 credits:					76		

YEAR 2 (144 CREDITS)
Semester 1

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
DAH 2501	Basic Veterinary Parasitology	5	02/28	21	8	DAH 2411	
DAH 2511	Animal Anatomy II	5	04/56	42	16	DAH 2412	
DAH 2531	Animal Physiology II	5	04/56	0	16	DAH 2432	
DAH 2551	Infectious Diseases I	5	04/56	42	16	DAH 2411	
DAH 2571	Basic Pharmacology and Toxicology	5	04/56	21	16	DAH 2432	
Total semester 1 credits:					72		

Semester 2

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
DAH 2502	Infectious Diseases II	5	02/28	21	8		DAH 2551
DAH 2522	Research Methods	5	02/28	0	8	DAH 2431	
DAH 2512	Animal Pathology	5	04/56	42	16	DAH 2412; DAH 2432	DAH 2511; DAH 2531
DAH 2532	Animal Production and Reproduction	5	04/56	42	16		
DAH 2552	Animal Nutrition	5	04/56	42	16		
DAH 2509	Field Attachment (Animal Production)	5	2 weeks		8		
Total semester 2 credits:					72		

YEAR 3 (128 CREDITS)
Semester 1 and 2

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
DAH 2600	Special Project	6	07/98		16	DAH 2522	

Semester 1

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
DAH 2601	Legislation and Jurisprudence	6	02/28	0	8		
DAH 2621	Introduction to Veterinary Epidemiology	6	02/28	14	8	DAH 2431	
DAH 2641	Herd and Flock Health Management	6	02/56	21	8		
DAH 2661	Introduction to Veterinary Public Health	6	02/56	21	8		
In addition to the above students in the Animal Health Technician option will cover the following modules							
VAT 2601	Veterinary First Aid	6	02/28	21	8		
VAT 2611	Animal Health Extension	6	04/56	42	16	DAH 2532 DAH 2552	
In addition to the above students in the Laboratory Technologist option will cover the following modules							
VVT 2601	Laboratory Biosafety and Biosecurity	6	02/28	21	8		
VVT 2611	Laboratory Techniques	6	04/56	42	16	DAH 2431	
Total semester 1 credits:					56		

Semester 2: Rotations

I. Animal Health Technician option

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
VAT 2682	Para-Professional Rotations AHT	6	10 weeks		56	All 1st and 2nd year modules	
Total semester 2 credits:					56		

II. Laboratory Technologist option

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
VVT 2682	Para-Professional Rotations LT	6	10 weeks		56	All 1st and 2nd year modules	
Total semester 2 credits:					56		

TOTAL PROGRAMME CREDITS: 416

MINIMUM REQUIREMENTS FOR RE-ADMISSION INTO THE FACULTY

ADVANCEMENT AND PROGRESSION RULES

A student shall advance to the next year of the study when the following minimum number of credits has been passed:

From Year 1 to Year 2: at least 112 credits
From Year 2 to Year 3: at least 240 credits

In addition, the following registration regulations will apply:

A student who has gained re-admission, but failed to progress to the next year of study, will be allowed to register for selected modules from the next level in addition to the failed modules, subject to the regulations on the maximum number of credits per year and provided than all pre-requisites are met.

D.2 MODULE DESCRIPTORS

D.2.1 FIRST YEAR MODULES

Module Title:	ENGLISH FOR GENERAL COMMUNICATION
Code	LEG 2410
NQF Level	4
Contact hours	Lectures: 4 x 1hr L/wk for 28 weeks (56hrs)
NQF Credits	32
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content:

This module develops a student's understanding, and competencies regarding academic conventions such as academic reading, writing, listening and oral presentation skills for academic purposes. Students are required to produce a referenced and researched essay written in formal academic style within the context of their university studies. Students are also required to do oral presentations based on their essays. The reading component of the Module deals with academic level texts; this involves students in a detailed critical analysis of such texts. The main aim is therefore to develop academic literacy in English.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2 theory assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	CONTEMPORARY SOCIAL ISSUES
Code	CSI 3580
NQF Level	5
Contact hours	Equivalent to 1 hour per week for two semesters (Online)
NQF Credits	8
Prerequisite	None (University Core Module)
Compulsory/Elective	Compulsory
Semester Offered	1 & 2 (Year Module)

Module Content:

The module, Contemporary Social Issues (CSI3580), is designed to encourage behavioural change among UNAM students and inculcate the primacy of moral reasoning in their social relations and their academic lives. In providing students with critical and analytical thinking the module enables students to grow and develop into well rounded citizens, capable of solving contemporary social challenges experienced in their communities and societies. The teaching of the module takes three dimensions: the intellectual, the professional and the personal dimensions. The intellectual dimension is fostered through engaging students with subject knowledge, independent learning and module assessment. The professional dimension, on the other hand, is fostered through exposing students to real life situations of case studies and practical exercises that draws attention to social issues that attract ongoing political, public and media attention and/or debate. Finally, the professional dimension is fostered through group work, online discussions and class participation.The unit further seeks to enhance HIV/AIDS preventive skills among students by means of paradigm shift and behavior change and also to impart general introductory knowledge on gender, to make students aware, as well as sensitize them towards gender issues and how they affect our society, Sub-Region and continent at large.

Assessment Strategies

Continuous Assessment: 100%

Module Title:	COMPUTER LITERACY
Code	CLC 3509
NQF Level	5
Contact hours	Lectures: 2 x 1hr L/wk for 14 weeks (28hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content
The module covers the following topics. Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system: file management, working with multiple programs, using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge.
Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the work book. Databases: creating tables, relationships, queries, forms and reports.
Presentation software: slide layout and master, animations, auto-content wizard and templates. Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

Assessment Strategies
Continuous Assessment: 100%

Module Title:	FUNDAMENTALS OF PHYSICAL SCIENCE
Code	DAH 2401
NQF Level	4
Contact hours	Lectures: 2 x 1hr L/week for 14 weeks (28hrs); Practicals: 1 x 3hr P / every 2nd week for 14 weeks (21hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Physical quantities and measurements – SI Units; properties of matter; atoms, elements, molecules & compounds, mixtures; separation methods such as filtration, distillation and decantation; the Periodic Table (electronic configuration of elements); common features of the families of elements with relevant examples; chemical symbols and formulae; covalent and ionic compounds; non-polar and polar molecules; molecular and formula mass; redox reactions; moles and molarity; chemical reactions and equations; acids and bases (definition, types, properties and reactions); pH & buffers; redox reactions; solutions and solubility; structure and properties of water; ionisation of water; laws of motion, force, energy, work; kinetic theory of gases; gas laws, pressure; thermodynamics and heat; mechanism of heat transfer, conduction, radiation and convection.

Assessment Strategies
1. Continuous Assessment: 60% (Minimum 2x theory assessments and 5 x practical assessments)
2. Examination: 40% (1 x 2 hour paper)

Module Title:	PRINCIPLES OF BIOLOGY
Code	DAH 2411
NQF Level	4
Contact hours	Lectures: 4 x 1hr L/wk for 14 weeks (56hrs); Practicals: 1 x 3hr P / week for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Chemical basis of life; structure of macromolecules and their functions; prokaryotic and eukaryotic cells; overview of the three domains and six kingdoms of organisms; basic plant and animal anatomy and physiology: differences between plant and animal cells; photosynthesis; osmosis & diffusion, cell respiration, passive and active transport;

basic taxonomy, basic concepts of Mendelian genetics: cell cycle; mitosis and meiosis; sexual and asexual reproduction; introduction to ecology, ecosystems and communities; naming of ecosystems and communities; food chain and food web; interrelationships among organisms.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2x theory assessments and 7x practical assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	APPLIED MATHEMATICS AND BASIC STATISTICS
Code	DAH 2431
NQF Level	4
Contact hours	Lectures: 4 x 1hr L/week for 14 weeks (56hrs); Tutorials: 1 x 2hr T / week for 14 weeks (28hrs)
NQF Credits	16
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Mathematics: decimals and fractions, simple algebraic equations, ratios and proportions, conversions between decimals, fractions, ratios, and percentages using appropriate animal health related examples.
Basic Statistics: variables, types of data, sources of data, rationale of sampling, sampling techniques, scales of measurement, measures of location: mean, median, mode, quartiles, percentiles, measures of absolute dispersion: range, mean, absolute deviation, standard deviation, graphical descriptive statistics: bar graphs, pie-charts, histograms, frequency polygons, stem and leaf plots and box plots.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2 x theory assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	VETERINARY PARAPROFESSIONAL SKILLS
Code	DAH 2402
NQF Level	5
Contact hours	Lectures: 2x 1hr L/week for 14 weeks (28hrs)
NQF Credits	8
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content
Introduction to communication skills and self-care, effective commmunication with clients to gain their confidence and coopearation, management of self and client stress; clinical interview and reporting skills (medical communication, patient history taking, client communication), human-animal bond; conflict of interest as it relates to animal welfare; awareness of environmental impacts related to all paraprofessional activities such as responsible use of chemical and disposal of hazardous wastes; basic business enterpreneural skills, basic accounting and budgeting skills.

Assessment Strategies
Continuous Assessment: 100% (Minimum 3 assessments)

Module Title:	ANIMAL ANATOMY I
Code	DAH 2412
NQF Level	4
Contact hours	Lectures: 4 x 1hr L/week for 14 weeks (56hrs); Practicals: 1 x 3hr P/ week for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Anatomical terminology, regions and planes of the animal body; Musculoskeletal (osteology, arthrology, myology), digestive (gross and topographical anatomy of the mouth, oesophagus, stomach, intestines, anatomical differences between ruminants and non-ruminants), cardiovascular (gross and topographical anatomy of the heart, blood

vessels and lymphatics), excretory (gross and topographical anatomy of the kidney, skin and accessory structures), and respiratory (gross and topographical anatomy of the lower and upper respiratory organs).

The practical component of this module will reflect an integrated approach between form (Anatomy) and function (Physiology).

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2x theory assessments and 7 x practical assessments)
2. Examination: 40% (1 x 3 hour paper: 50% and 1x 2hr practical exam: 50%)

Module Title:	ANIMAL PHYSIOLOGY I
Code	DAH 2432
NQF Level	4
Contact hours	Lectures: 4 x 1hr L/week for 14 weeks (56hrs);
NQF Credits	16
Co-requisites	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Organ system integration, structure-function relationship, homeostasis, physiology of the musculoskeletal (muscle types, muscle contraction, muscle fatigue, myopathies), digestive (types of digestive systems, digestion and absorption of carbohydrates, proteins and fats; differences in digestion between ruminants and non-ruminants), cardiovascular (composition and functions of blood and lymphatic system, measuring of blood parameters such as blood pressure, hematocrit, PCV, heart rate, functioning of the circulatory system, effect of altitude on cardiovascular physiology), excretory (renal physiology: urine formation, factors affecting urine production, micturition, urinalysis; skin physiology: sweat, sebum, thermoregulation), and respiratory systems (ventilation, gaseous exchange, lung volumes, measuring respiration rate, factors affecting respiration such as altitude, exercise, pregnancy, etc.).

While there are no formal practicals attached directly to this module, the relevant practical aspects of the content will be covered under Anatomy I (DAH 2412) in an integrated way.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2x theory assessments and 7 x practical assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	BASIC ANIMAL BEHAVIOR, HANDLING AND WELFARE
Code	DAH 2452
NQF Level	4
Contact hours	Lectures: 4 x 1hr L/week for 14 weeks (56hrs); Practicals: 1 x 3hr P / every 2nd week for 14 weeks (21hrs)
NQF Credits	16
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Normal behavior of livestock and companion animals; major types of behavior (pre-consumatory, consumatory and post-consumatory) in livestock and companion animals; correct handling and restraining methods of healthy and unhealthy animals (psychological, physical and chemical) as well as the impact of these methods on animal behaviour and welfare.
Aspects of animal welfare with specific reference to the Five Freedoms and OIE animal welfare recommendations; disaster management of animals in emergency situations as well as physiological, behavioural, disease and production parameters of animal welfare; animal husbandry issues such as housing, handling, transport and slaughter of animals with relevance to their impact on the welfare of animals; relevant animal protection and welfare legislations, including the university's animal welfare policies, and the role of welfare organisations.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2x theory assessments and 5 x practical assessments)
2. Examination: 40% (1 x 3 hour paper)

D.2.2 SECOND YEAR MODULES

Module Title:	BASIC VETERINARY PARASITOLOGY
Code	DAH 2501
NQF Level	5
Contact hours	Lectures: 2 x 1hr L/week for 14 weeks (28hrs); Practicals: 1 x 3hr P / every 2nd week for 14 weeks (21hrs)
NQF Credits	8
Prerequisites	DAH 2411
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Common internal and external parasites of livestock and companion animals in Namibia, including zoonotic diseases (sampling, processing and analysing parasitological specimens); common parasitic diseases (clinical symptoms, prevention, appropriate use of antiparasitic drugs and parasite control programs) of livestock and companion animals.

Assessment Strategies
1. Continuous Assessment: 60% (Minimum 2x theory assessments and 5x practical assessments)
2. Examination: 40% (1 x 2 hour paper)

Module Title:	ANIMAL ANATOMY II
Code	DAH 2511
NQF Level	5
Contact hours	Lectures: 4 x 1hr L/week for 14 weeks (56hrs); Practicals: 1 x 3hr P/ week for 14 weeks (42hrs)
NQF Credits	16
Pre-requisite	DAH 2412
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Reproductive system (gross and topographical anatomy of male and female internal and external reproductive organs of livestock), endocrine system (topographical anatomy of the major endocrine glands), nervous system (gross and topographical anatomy of the major structures of the central and peripheral nervous systems of common livestock, anatomy of the eye, external ear, and the tongue), reticulo-endothelial system (location of major lymphatics and the spleen); anatomical adaptations of birds, reptiles and fish.

The practical component of this module will reflect an integrated approach between form (Anatomy) and function (Physiology).

Assessment Strategies
1. Continuous Assessment: 60% (Minimum 2x theory assessments and 7 x practical assessments)
2. Examination: 40% (1 x 3 hour paper) and 1x 2hr practical exam: 50%)

Module Title:	ANIMAL PHYSIOLOGY II
Code	DAH 2531
NQF Level	5
Contact hours	Lectures: 4 x 1hr L/week for 14 weeks (56 hrs);
NQF Credits	16
Pre-requisites	DAH 2432
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Functions of the reproductive system (spermatogenesis, oogenesis, puberty, estrus cycle, role accessory sex glands, fertilisation, pregnancy and parturition physiology, reproductive endocrinology); endocrine system (cooperation between nervous and endocrine system, endocrine glands, hormones and their functions); nervous system and sensory physiology (nerve impulse, action potential, reflexes, neurotransmission, feedback mechanism, function of the sense organs); immune system (innate and adaptive immunity, active and passive immunity, the role of colostrum in neonates, physiology of vaccination and animal response, recognition of self and non-self, serological

reactions); avian, reptilian and fish physiology and their adaptation to their respective environments will also be covered.

While there are no formal practicals attached directly to this module, the relevant practical aspects of the content will be covered under Anatomy I (DAH 2511) in an integrated way.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2x theory assessments and 7 x practical assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	INFECTIOUS DISEASES I
Code	DAH 2551
NQF Level	5
Contact hours	Lectures: 4 x 1hr L/week for 14 weeks (56hrs); Practicals: 1 x 3hr P/week for 14 weeks (42hrs)
NQF Credits	16
Pre-requisites	DAH 2411
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Introduction to microbiology, including common food-borne pathogens; selected bacterial and mycoplasmal diseases of veterinary importance to the Namibian animal industry (including zoonotic diseases), recognition of clinical signs and management of infected animals, as well as preventing the transmission of the disease; relevant control programs such as movement control, quarantine and vaccination of common bacterial diseases;

Laboratory content will focus on biosafety and biosecurity, appropriate sample handling, staining of bacteria, culturing, isolation of bacterial pathogens.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2x theory assessments and 7 x practical assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	BASIC PHARMACOLOGY AND TOXICOLOGY
Code	DAH 2571
NQF Level	5
Contact hours	Lectures: 4 x 1hr L/week for 14 weeks (56hrs); Practicals: 1 x 3hr P/every 2nd week for 14 weeks (21hrs)
NQF Credits	16
Pre-requisite	DAH 2432
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content
Pharmacology: Classification of pharmaceutical products; dosage calculation, routes of administration, absorption, distribution and excretion in the animal body, withdrawal periods; handling and storage; different classes of pharmaceutical products will include: antibiotics, anaesthetics, hormones, antihistamines, vitamins, vaccines, antisera, parasiticides, disinfectants, antiseptics, and antidotes, etc.; legislation regulating the use of medicines in Namibia.
Toxicology: Effect and management of toxicoses including those caused by toxic plants and chemicals and heavy metals including arsenic, strichnine, organophosphates, carbamates, cyanide, lead, mecury, pesticides, herbicides, urea, salt/water intoxication, mycotoxins and venomous animals.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2x theory assessments and 5x practical assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	INFECTIOUS DISEASES II
Code	DAH 2502
NQF Level	5
Contact hours	Lectures: 1x 2hr L/week for 14 weeks (28hrs); Practicals: 1 x 3hr P / every 2nd week for 14 weeks (21hrs)
NQF Credits	8
Co-requisite	DAH 2551

Compulsory/Elective	Compulsory
Semester Offered	2

Module Content
Selected viral, prion and fungal diseases of veterinary importance to the Namibian animal industry (including zoonotic diseases), recognition of clinical signs and management of infected animals, as well as preventing the transmission of the disease; relevant control programs such as movement control, quarantine and vaccination of common viral, prion and fungal diseases.
Laboratory content will focus on biosafety and biosecurity, appropriate sample handling.

Assessment Strategies
1. Continuous Assessment: 60% (Minimum 2x theory assessments and 5 x practical assessments)
2. Examination: 40% (1 x 2 hour paper)

Module Title:	RESEARCH METHODS
Code	DAH 2522
NQF Level	5
Contact hours	Lectures:1 x 2hr L/week for 14 weeks (28hrs)
NQF Credits	8
Pre-requisite	DAH 2431
Semester Offered	2

Module Content
The scientific method, formulation of a topic, problem statement, objectives, research questions/ hypotheses; literature review, experimental design, data collection and analysis, interpretation and discussion of findings, power point presentation.

Assessment Strategies
1. Continuous Assessment: 60% (Minimum 2 x theory assessments)
2. Examination: 40% (1 x 2 hour paper)

Module Title:	ANIMAL PATHOLOGY
Code	DAH 2512
NQF Level	5
Contact hours	Lectures: 4 x 1hr L/week for 14 weeks (56hrs); Practicals: 1 x 3hr P / week for 14 weeks (42hrs)
NQF Credits	16
Prerequisites	DAH 2412 and DAH 2432
Co-requisites	DAH 2511 and DAH 2531
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content
Introduction to pathology, common *post mortem* changes such as *rigor mortis*, putrefaction etc., cellular pathology, including lesions due to various disease processes, circulatory disturbances, inflammation and neoplasia; basic pathology of the major systems (cutaneous, muscular, respiratory, endocrine, skeletal, nervous, reproductive, cardiovascular, gastrointestinal, lymphatic); necropsy procedure, appropriate sampling methods (collection, packaging, labelling, storage, transport and basic processing).

Assessment Strategies
1. Continuous Assessment: 60% (Minimum 2x theory assessments and 7 x practical assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	ANIMAL PRODUCTION AND REPRODUCTION
Code	DAH 2532
NQF Level	5
Contact hours	Lectures: 4 x 1 hr L/week for 14 weeks (56hrs); Practicals: 1 x 3hr P / week for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content

The reproductive cycle of livestock species, and mating behaviour; principles of the application of assisted reproductive technologies with emphasis on oestrus synchronization and artificial insemination; basic reproductive disorders of both male and female domestic animals with emphasis on the causes, recognizing clinical symptoms and management thereof; basic approach to the management of dystocia cases in livestock and post-partum problems; correct approach to the management of pregnant and newborn animals; genetic principles used in breeding and selection of farm animals as well as its practical application.
Fundamental principles of animal farming including benefits of animal products and scope of the animal industry and production systems in Namibia; planning and application of relevant intensive and extensive management programs; economic considerations using basic methods such as partial budgeting and cost-benefit analysis, marketing practices and consumer affairs.

Assessment Strategies:

1. Continuous Assessment: 60% (Minimum 2 x theory assessments and 7 x practical assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	ANIMAL NUTRITION
Code	DAH 2552
NQF Level	5
Contact hours	Lectures: 4 x 1hr L/wk for 14 weeks (56hrs); Practicals: 1 x 3hr P/ week for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content
Introduction to animal nutrition, classification and nutritional values of feeds, chemical composition of feeds, feed analysis, nutritional requirements of farm animals, feeding of various groups of animals (rations formulation) in different physiological states, nutritional disorders including acidosis, ketosis, bloat, milk fever, etc.
Veld types of Namibia and their characteristics, common forage species, feeding habits and selective feeding; principles of rangeland management including carrying capacity, resting of veld, rotation, rehabilitation and invasive plants; cultivated forage, preparation and storage of feedstuff such as hay and silage will also be discussed.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2x theory assessments and 7x practical assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	FIELD ATTACHMENT (ANIMAL PRODUCTION)
Code	DAH 2509
NQF Level	5
Contact hours	Fieldwork attachment for 2 weeks
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Contents:
All diploma students will undertake two (2) weeks of field attachment on a farm approved by the university to gain practical exposure to animal production systems (housing, feeding and management practices) and hands-on skills such as animal handling and restrain. Students will be expected to complete a prescribed list of tasks verified by the farm manager.

Assessment Strategies
Continious assessment 100%:
report presentation at a seminar
(40%) field report (60%)

Assessment is subject to satisfactory attendance and good conduct during attachment, submission of a signed, verified and approved logbook detailing the activities completed.

D.2.3 THIRD YEAR MODULES

Module Title: SPECIAL PROJECT
Code: DAH 2600

NQF Level: 6
Contact hours: 98 integrated over 28 weeks
NQF Credits: 16
Pre-requisites: DAH 2522
Compulsory/Elective: Compulsory
Semester Offered: 1 & 2

Module Contents:
Students carry out a supervised study of a current topic related to the chosen option (Animal Health or Laboratory Technology). Each student will work under the supervision of a faculty advisor to plan and excute a study. Students will present their results orally and submit a written report.

Assessment Strategies
Continous assessment 100%:
Project proposal (10%)
Oral presentation (30%)
Final written report (60%)

Module Title:	LEGISLATION AND JURISPRUDENCE
Code	DAH 2601
NQF Level	6
Contact hours	Lectures: 2x 1hr L/week for 14 weeks (28hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content
Relevant aspects of Namibian legislation pertaining to the activites of veterinary paraprofessionals: Animal Health Act, Act 1 of 2011; Animal Protection Act, Act 12 of 1962; Veterinary and Veterinary Paraprofessionals Act, Act 1 of 2013; Prevention of Undesirable Residues in Meat Act, Act 21 of 1991; Medicines and Related Substances Control Act, Act 13 of 2003; Stock Brands Act, Act 24 of 1995; Nature Conservation Ordinance 1975 and associated Rules and Regulations; UNAM code of conduct for veterinary paraprofessionals

Assessment Strategies
1. Continuous Assessment: 60% (Minimum 3 assessments)
2. Examination: 40% (1 x 2 hour paper)

Module Title:	INTRODUCTION TO VETERINARY EPIDEMIOLOGY
Code	DAH 2621
NQF Level	6
Contact hours	Lectures: 1 x 2hr L/week for 14 weeks (28 hrs); Tutorials: 1 x 2hr T / every 2nd week for 14 weeks (14hrs)
NQF Credits	8
Prerequisite	DAH 2431
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content
Basic epidemiological concepts, fields of epidemiology, population and its characteristics, emerging and course of a disease in populations; questionnaire administration, basics of disease survey, sampling and sample size; evaluation of disease risk factors and mode of disease transmission; methods of disease control schemes, disease outbreak contingency and response plans, basics of disease control and investigation; monitoring, surveillance and early warning systems

Assessment Strategies
1. Continuous Assessment: 60% (Minimum 3 assessments)
2. Examination: 40% (1 x 2 hour paper)

Module Title:	HERD AND FLOCK HEALTH MANAGEMENT
Code	DAH 2641

NQF Level	6
Contact hours	Lectures: 2x 1hr L/week for 14 weeks (28hrs); Practicals: 1 x 3hr P / every second week for 14 weeks (21hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content
Overview of herd and flock management in cattle, sheep, goats, pigs and poultry, health management strategies including vaccination programs, biosecurity protocols, culling management, and effective record keeping; emphasis will be placed on monitoring and management of replacement rearing, dry period, milk production, herd fertility, udder health in dairy cattle and principle of all-in all-out protocols.

Assessment Strategies
1. Continuous Assessment: 60% (Minimum 2x theory assessments and 5x practical assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	INTRODUCTION TO VETERINARY PUBLIC HEALTH
Code	VPH 2661
NQF Level	6
Contact hours	Lectures: 2 x 1hr L/week for 14 weeks (28hrs); Practicals: 1 x 3hr P every 2nd week for 14 weeks (21hrs)
NQF Credits	8
Pre-requisite	DAH 2512
Compulsory/Elective	Elective
Semester Offered	1

Module Content
Introduction to the one health concept, overview of diseases that are an occupational/public health risk in the meat industry (including brucellosis, bovine tuberculosis, Crimean Congo Haemorrhagic Fever), zoonoses and public health; meat establishment siting and layout (All species- bovine, porcine, sheep, poultry and game abattoir); an overview of animal welfare requirements at the time of slaughter; ante-mortem inspection; slaughter, dressing and storage processes (bovine, porcine, sheep, poultry and game); primary meat inspection (post-mortem) procedures for bovine, porcine, sheep, poultry and game carcasses and offals);common and important pathological conditions observed during meat inspection in cattle, sheep, pig, poultry and game meat; temperature requirements for chilling and freezing of meat; carcass detaining procedures; storage, handling and disposal of condemned meat and waste (effluent, blood and solid waste); the 7 principles of Hazard Analysis Critical Control Point (HACCP)systems; record keeping

Assessment Strategies
1. Continuous Assessment: 60% (Minimum 2x theory assessments and 7x practical assessments)
2. Examination: 40% (1 x 3 hour paper: 50% and 1x 2hr practical exam: 50%)

Module Title:	VETERINARY FIRST AID
Code	VAT 2601
NQF Level	6
Contact hours	Lectures: 2 x 1hr L/week for 14 weeks (28hrs); Practicals: 1 x 3hr P/every 2nd week for 14 weeks (21hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Elective
Semester Offered	1

Module Content
Basic equipment and first aid kit needed for emergency management of farm animals; aseptic preparations for surgical procedure; basic principles of anesthesia; principles of routine management procedures such as castration and dehorning; resuscitation, splinting and stabilisation of broken bones/horns and dislocated joints; management of allergic reactions, poisoning, burns, bleeding and bloat; post operative care and wound management; management of a downer cow.

Assessment Strategies
1. Continuous Assessment: 60% (Minimum 2x theory assessments and 5x practical assessments)
2. Examination: 40% (1 x 2 hour paper: 50% and 1x 2hr practical exam: 50%)

Module Title:	ANIMAL HEALTH EXTENSION
Code	VAT 2611
NQF Level	6
Contact hours	Lectures: 4 x 1hr L/week for 14 weeks (56hrs); Practicals: 1 x 3hr P / week for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	DAH 2532 and DAH 2552
Compulsory/Elective	Elective
Semester Offered	1

Module Content

Overview of the effective paraveterinary service delivery for the improved productivity of farm animals, including information dissemination techniques; principles and use of participatory rural appraisal (PRA), as well as standard operational procedures involved in farm inspection, community visits and animal gatherings; the role of the animal health technician in supporting state veterinarians with respect to the improvement, control and monitoring of the health status of the national herd; animal disease control, surveillance and monitoring activities; the execution/control of vaccination programs, the control of stock movements; stock inspections, livestock census, etc.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2x theory assessments and 7x practical assessments)
2. Examination: 40% (1 x 3 hour paper)

Module Title:	LABORATORY BIOSAFETY AND BIOSECURITY
Code	VVT 2601
NQF Level	6
Contact hours	Lectures: 2x 1hr L/week for 14 weeks (28hrs); Practicals: 1 x 3hr P / every 2nd week for 14 weeks (21hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Elective
Semester Offered	1

Module Content

Laboratory design and work practices; flow of samples from reception to result including handling and control; safe handling of laboratory equipment and materials, personal protective equipment and clothing; sterilization and disinfection in the laboratory; laboratory biosafety protocols; hazards and risks associated with the handling of pathological and other biohazardous materials, containment levels; handling and storage of biological/pathological materials; disposal of waste, expired chemicals and other hazardous materials; principles of laboratory biosecurity, biosecurity guidelines, good microbiology practices; quality control aspects of a diagnostic laboratory.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2x theory assessments and 5x practical assessments)
2. Examination: 40% (1 x 2 hour paper)

Module Title:	LABORATORY TECHNIQUES
Code	VVT 2611
NQF Level	6
Contact hours	Lectures: 4 x 1hr L/week for 14 weeks (56hrs); Practicals: 1 x 3hr P/ week for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	DAH 2431
Compulsory/Elective	Elective
Semester Offered	1

Module Content

Common laboratory Instrumentation used in veterinary diagnostic, practice and research/teaching laboratories; measurements, weights and volumes; calculating concentrations and dilutions, preparing solutions, buffers and media; quality control (calibration of instruments, standardization, verification of standard solutions, etc.); common diagnostic procedures in clinical pathology (hematology, urinalysis, cytology), histopathology (tissue preparation for microscopy), microbiology (bacteriology, virology, mycology), immunology (serology) and parasitology (helminthology, protozoology, entomology); effective record keeping and reference systems.

Assessment Strategies

1. Continuous Assessment: 60% (Minimum 2x theory assessments and 5x practical assessments)
2. Examination: 40% (1 x 3 hour paper: 50% and 1x 2hr practical exam: 50%)

Module Title:	PARA-PROFESSIONAL ROTATIONS AHT
Code	VAT 2682
NQF Level	6
Contact hours	Rotation (10 weeks)
NQF Credits	56
Prerequisite	All 1st and 2nd year modules
Compulsory/Elective	Elective
Semester Offered	2

Module Content

Students will complete a 10-week rotation; three (3) weeks at a registered private large animal or mixed veterinary facility and seven (7) weeks at a state veterinary office. During this period students will be required to complete a list of activities as reflected in the prescribed logbook.

Assessment strategies

1. Successful completion of all rotations, and submission of a complete verified and signed off Log Book will serve as examination admission.
2. Examination: 100% (oral/practical examination: 20%; 1x3hr written paper: 80%)

Module Title:	PARA-PROFESSIONAL ROTATIONS LT
Code	VVT 2682
NQF Level	6
Contact hours	Rotation (10 weeks)
NQF Credits	56
Prerequisite	All 1st and 2nd year modules
Compulsory/Elective	Elective
Semester Offered	2

Module Content

Students will complete a 10-week rotation; Three (3) weeks at a registered private practice laboratory or teaching laboratory and seven (7) weeks at the Central Veterinary Laboratory or equivalent facility. During this period students will be required to complete a list of activities as reflected in the prescribed logbook.

Assessment strategies

1. Successful completion of all rotations, and submission of a complete verified and signed off Log Book will serve as examination admission.
2. Examination: 100% practical examination

E. B.SC. AGRICULTURE (AGRICULTURAL ECONOMICS) HONS (17BSAE)

All modules listed below, except English Communication and Study Skills, English for Academic Purposes and Contemporary Social Issues, will be offered by Faculty of Science. English Communication and Study Skills, English for Academic Purposes, Contemporary Social Issues and Computer Literacy are University Core Modules taken by all First Year University of Namibia students.

E.1 PROGRAMME SCHEDULE

Course code	Course name	NQF Level	Credits	Compulsory(C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 1 Semester 1					
UCLC 3509	Computer Literacy	5	8	C	
ULCE 3419	English Communication and Study Skills	4	16	C	
UCSI 3580	Contemporary Social Issues	5	8	C	
SBLG 3511	Introduction to Biology	5	16	C	
CEMI 3522	Basic Microeconomics	5	16	C	
SMAT 3511	Basic Mathematics	5	16	C	
Total Credits Semester 1					80
Year 1 Semester 2					
CEMA 3572	Basic Macroeconomic	5	16	C	
SBLG 3512	Diversity of Life	5	16	C	
SMAT 3512	Pre-calculus	5	16	C	
SSTS 3522	Introduction to Statistics	5	8	C	
ULEA 3519	English for Academic Purposes	5	16	C	
Total credits Semester 2					72
TOTAL CREDITS YEAR 1					152

Year 2 Semester 1					
AAEI 3681	Intermediate Microeconomics	6	12	C	CEMI3571 (Basic Microeconomics)
AAEC 3691	Rural Sociology	6	12	C	None
AAEF 3681	Financial Management	6	12		None
					None
AAEA 3681	Agric. Communication and Group Dynamics	6	12	C	None
ACSC 3691	Agronomy	6	12	C	None
Total Credits Semester 1					60
Year 2 Semester 2					
AAEC 3682	Production Economics	6	12	C	CEMI3571(Basic Microeconomics)
AAEI 3682	Intermediate Macroeconomics	6	12	C	CEMA3572(Basic Macroeconomics)
AAEC 3612	Mathematical Economics & Linear Programming	6	16	C	SMAT 3511 (Basic Mathematics)

					None
AASC 3602	Livestock Production Systems	6	8	C	None
AFST 3602	Food Technology	6	8	C	None
Total credits Semester 2					60
TOTAL CREDITS YEAR 2					120

Year 3 Semester 1					
AACA 3701	Field Attachment I*	7	8	C	
ACSE 3781	Agricultural Engineering	7	12	C	None
AAEC 3751	Econometrics	7	16	C	AAEC 3612 (Mathematical Economics & Linear Programming)
AAER 3781	Resource Economics	7	12	C	AAEI 3681 (Intermediate Microeconomics)
AAEC 3781	Farm Planning and Management	7	12	C	None
AAED 3781	Development Economics	7	12	C	None
Total Credits Semester 1					70
Year 3 Semester 2					
AAER 3782	Research Methodology in Agric. Economics	7	12	C	None
AAEC 3712	Agricultural Extension	7	16	C	AAEC 3691 (Rural Sociology)
AAEC 3702	Entrepreneurship	7	8	C	None
ACSC 3722	Crop Storage and Handling	7	8		None
AAEA 3782	Agricultural Price analysis and Forecasting	7	12	C	AAEC 3731 (Econometrics)
AAEC 3782	Agricultural marketing	7	12	C	None
Total credits Semester 2					68
TOTAL CREDITS YEAR 3					138

Year 4 Semester 1					
AACA 3801	Field Attachment II	8	8	C	
AAEC 3810	Research Project in Agricultural Economics	8	16	C	AAER 3782 (Research Methodology in Agricultural Economics)
AAEC 3881	Project Planning and Management	8	12	C	None
AAEC 3891	International Agricultural Trade	8	12	C	None
AASC 3881	Beef Production	8	12	C	None
Total Credits Semester 1					62
Year 4 Semester 2					
AAEC 3810	Research Project in Agricultural Economics	8	16		AAER 3782 (Research Methodology in Agricultural Economics)

AAEC 3882	Agricultural Policy Analysis	8	12		None
AAEA 3882	Agric. Business Management	8	12		None
AASC3892	Small Ruminant Production	8	12		None
AAEC 3842	Rural Development	8	8		AAEC 3712 (Agricultural Extension)
Total credits Semester 2					60
TOTAL CREDITS YEAR 4					122
TOTAL CREDITS FOR THE PROGRAMME					532

E.2 MODULE DESCRIPTORS

E.2.1 FIRST YEAR MODULES

CLC3509 COMPUTER LITERACY

Module title: COMPUTER LITERACY
Code: CLC3509
NQF level: 5
Contact hours: 1 lecture theory and 1 lecture practical per week for 14 weeks
Credits: 8
Module assessment: Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%
Prerequisites: University Entry

Content: The module covers the following topics. Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system: File Management, working with multiple programs, using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge. Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the workbook. Databases: creating tables, relationships, queries, forms and reports. Presentation software: slide layout and master, animations, auto-content wizard and templates. Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

LCE3419 ENGLISH COMMUNICATION & STUDY SKILLS

Module title: ENGLISH COMMUNICATION AND STUDY SKILLS
Code:
NQF Level: LCE3419
Contact hours: 4
Credits: 4 hours per week for 14 weeks
Module Assessment: 16
Continuous assessment (60%): two tests (reading and writing), two reading assignments,
one oral presentation Examination (40%): one three hour examination paper
Pre-requisites: None
Module Aims: This module is aimed at assisting students in the development of their reading, writing and speaking and listening skills, in order to cope with studying in a new academic environment and in a language which may not be their first language. The module also focuses on study skills that students need throughout their academic careers and beyond. The module serves as an introduction to university level academics, where styles of teaching and learning differ from those at secondary schools in that more responsibility is placed on the student. The module therefore, focuses on the skills that students need throughout their academic careers and beyond.

CSI 3580 CONTEMPORARY SOCIAL ISSUES

Code: CSI 3580
NQF Level: 5
Contact hours: Equivalent to 1 hour per week for two semesters (Online)
NQF Credits: 8
Prerequisite: None (University Core Module)
Compulsory/Elective: Compulsory
Semester Offered: 1 & 2 (Year Module)

Module Descriptor (Rationale of the module):

The module, Contemporary Social Issues (CSI3580), is designed to encourage behavioural change among UNAM students and inculcate the primacy of moral reasoning in their social relations and their academic lives. In providing students with critical and analytical thinking the module enables students to grow and develop into well rounded citizens, capable of solving contemporary social challenges experienced in their communities and societies. The teaching of the module takes three dimensions: the intellectual, the professional and the personal dimensions. The intellectual dimension is fostered through engaging students with subject knowledge, independent learning and module assessment. The professional dimension, on the other hand, is fostered through exposing students to real life situations of case studies and practical exercises that draws attention to social issues that attract ongoing political, public and media attention and/or debate. Finally, the professional dimension is fostered through group work, online discussions and class participation.

SBLG 3511: INTRODUCTION TO BIOLOGY

Module title: INTRODUCTION TO BIOLOGY
Code:
Course Equivalent: SBLG 3511
NQF level: Contact Biology 1A 4
hours: Credits: 4 lectures/ week for 14 weeks and one 3-hour practical session per week.
16
Module assessment: Continuous assessment (40%): Theory (not less than 3 tests and 2 assignments), 40%. Practicals (not less than 10 marked assignment), 60%. Examination (60%): 3 hour examination paper.
Prerequisites: NSCC (Biology C or better)
Module Content: It will consider organization of life, chemical basis of life, carbohydrates, proteins, nucleic acids, lipids and fats, water, cell structure and function, prokaryotic and eukaryotic cells, ultra-structure of plant and animal cells, cytoskeleton, membrane structure and function, cell communication, mitosis, meiosis, cell reproduction, cell cycle, and cell death. The following topics will be covered: Introduction to systems of classification, taxonomy and binomial nomenclature, including the five kingdoms and the three domein system. Definitions and categories/groups within the five kingdoms, evolution by natural selection (microevolution vs macroevolution), phylogeny and evolutionary relationships in five kingdoms. The course content will also include genes, chromosomes, genomes, Mendelian genetics, extensions to Mendelian genetics, chromosome theory of inheritance, linkage and cross-over, recombination, sex determination. The course content will also cover an introduction to Ecology: Definitions, history, scales in ecology, application of ecology. Conditions and Resources: Environmental conditions, animals and their resources, plants and their resources.

SMAT 3511: BASIC MATHEMATICS

Module name: BASIC MATHEMATICS
Code: SMAT 3511
NQF level: 5
Contact hours: 4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits: 16
Module Assessment: Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite: NSSC Mathematics
Module Content: Sets: notations and diagrams to represent sets, subset, empty set, equality of sets, intersection, union, complement. Algebraic expressions: simplification, expansion, polynomials, reminder and factor theorem, partial fractions. Trigonometry: trigonometric functions, basic trigonometric identities. The absolute value, linear equations, linear inequalities, quadratic equations, the quadratic formula, quadratic inequalities. Functions: domain, codomain, image, preimage, even function, odd function. Sequences: the general term, the geometric sequence, the arithmetic sequence. The Binomial Theorem.

BASIC MICROECONOMICS CEMI3571

NQF Level: 5 Credits: 16 Contact hours: 4 hours lecture per week for 14 weeks
Module assessment: Continuous assessment 50%: two tests and one assignment
Examination 50%: 1 x 3 hour examination paper
Pre-requisites: None
Module Content:
Economics is the study of how society allocates scarce resources to satisfy the wants of its members for goods and service. As such, it is a subject concerned with issues of both efficiency and equity. An efficient economy gets the most it can from its scarce resources; an equitable economy fairly distributes the benefits of its resources among its members. Is the economy efficient? Is the economy fair? The course aims to introducing students to key concepts used in microeconomics and facilitate a basic understanding of the economic phenomena. The course is designed to help students understand that society's economic choices often involve trade-offs between efficiency and equity.

LEA3519 ENGLISH FOR ACADEMIC PURPOSES

Module title:	ENGLISH FOR ACADEMIC PURPOSES
Code:	LEA3519
NQF level:	5
Contact hours:	4 periods per week for 14 weeks
Credits:	16
Module assessment:	Continuous assessment (60%): 2 tests (reading and writing), 1 academic written essay,1 oral presentation Examination (40%) : One three hour examination paper
Prerequisites:	None

Module Content: This module develops a student's understanding, and competencies regarding academic conventions such as academic reading, writing, listening and oral presentation skills for academic purposes. Students are required to produce a referenced and researched essay written in formal academic style within the context of their university studies. Students are also required to do oral presentations based on their essays. The reading component of the course deals with academic level texts. This involves students in a detailed critical analysis of such texts. The main aim is therefore, to develop academic literacy in English.

SBLG 3512: DIVERSITY OF LIFE

Module title:	DIVERSITY OF LIFE
Code:	SBLG 3512
Course Equivalent:	NSSC (/HIGH GRADE) Biology
NQF level:	5
Contact hours:	4 lecture periods / week for 14 weeks and one three hour practical session per week
Credits:	16
Module assessment:	Continuous assessment: Theory (not less than 3 tests and 2 Assignments) 40% Practicals (not less that 10 marked assignments) 50% Examination: 60% (1 x 2 hour examination paper)
Prerequisites:	NSCC (Biology C or better)

Module Content:

This module is designed to give students a detailed understanding of the diversity of life. It gives students the broader appreciation of biodiversity in the different ecological habitats. The course shall describe diagnostic characteristics of principle taxonomic categories for each phylum. Coverage of each Phylum shall follow a phylogenetic (evolutionary) approach as well as introduce broad ecological and physiological principles. Various aspects of reproduction and development shall be highlighted. This module prepares students to understand subsequent courses such as Introduction to Ecology and Microbiology, Population Ecology, Comparative physiology, Biogeography, Plant and Animal Form and Function

Topics covered will include viral, bacterial, fungal, algal, animal and plant diversity. It then considers the characteristics and life cycles of the following important algae, animal and plant groups: Chlorophyta, Phaeophyta, Rhodophyta, Chrysophyta, Euglenophyta, Pyrrophyta, Cryptophyta, Protostomate phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostomate phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chodrichthyes, Actinopterygii, Actinistia, Dipnoi, Amphibia, Reptilia, Aves, Mammalia) bryophytes, seedless vascular plants, gymnosperms, and the angiosperms. Concepts such as Homology and analogy; body symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered.

Examples from Namibia shall be used where possible and applicable. The course content shall be supplemented with appropriate weekly practical sessions in the laboratory and in the field.

SMAT 3512: PRE-CALCULUS

Module Title:	PRE-CALCULUS
Code:	SMAT 3512
NQF level:	5
Contact hours:	4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits:	16
Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite:	NSSC Mathematics

Module Content: Functions: one-to-one and onto functions, horizontal line test, composition of functions, inverse of a function. Introduction to exponential and logarithmic functions. Limit of a function: definition, left and right limits, infinite limits, limits at infinity, continuity in terms of limits. Differentiation: rate of change, derivative of a function, rules of differentiation, increasing and decreasing functions and graph sketching. Integration: antiderivatives, the definite integral, area under a graph. Trigonometry: further trigonometric identities, area of a sector and segment of a circle, derivatives and integrals of trigonometric functions.

SSTS 3522: INTRODUCTION TO STATISTICS

Module Title:	INTRODUCTION TO STATISTICS
Code:	SSTS 3522
NQF Level:	5
Contact Hours:	2 Lectures per Week + 1 hour tutorial per week for 14 weeks
Credits:	8
Module Assessment:	Continuous assessment (at least two tests and two assignments) 40%, Examination 60% (1x2 Hour examination paper)
Prerequisites:	C in IGCSE Mathematics

Module Content:

Definition: Statistics; descriptive, inferential. Variables: qualitative versus quantitative. Data types: primary versus secondary, categorical versus discrete, continuous. Sources of data. Population versus sample. Types of measurements: nominal, ordinal, interval, ratio scales. Presentation of data: tabular forms and graphical methods: histograms, pie charts, bar charts, frequency polygons, ogives, stem- and- leaf plots, box- and-whiskers plots. Measures of Central Tendency: Σ notation, mean, median, mode, quartiles, percentiles. Measures of Dispersion: variance, standard deviation, range, inters- quartile range, skewness and kurtosis. Identification of outliers. Uses of scientific calculators for statistical manipulation limited to calculation of mean, standard deviation.

CEMA3572: BASIC MACROECONOMICS

Module Title:	BASIC MACROECONOMICS
Code:	CEMA3572
NQF Level:	5
Credits:	16
Contact hours:	4 hours lecture per week for 14 weeks
Module assessment:	Continuous assessment 50%: two tests and one assignment Examination 50%: 1 x 3 hour examination paper
Pre-requisites:	None

Module Content:

This course introduces basic concepts and tools used in macroeconomic analysis: the theory, measurement, and determination of national income; business cycles; the multiplier; fiscal policy, budget deficits, and the national debt; aggregate supply and aggregate demand; money, banking, and monetary policy; exchange rates and balance of payments accounts; and stabilization policy for unemployment and inflation.

(Although the above information has been compiled as accurately as possible, the Faculty of Agriculture and Natural Resources cannot be held responsible for any errors and/or omissions which may occur in the above module descriptors of modules offered by other Departments.)

E.2.2 SECOND YEAR MODULES

Module Title: INTERMEDIATE MICROECONOMICS

Code	AAEI 3681
NQF Level	*6*
NQF Credits	*12*
Contact hours	3 lectures per week for 14 weeks
Prerequisite	CEMI 3571Basic Microeconomics
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

This course aims to develop students' ability to use some fundamental tools of microeconomics analysis and to apply them to a wide range of economic problems. In particular, the analytical tools are intended to assist students in understanding and undertake research into the area of agricultural economics and agribusiness. This implies focus on firm level issues including the agency problem, consumer behavior looking at choice, preferences, budget constraints, and utility maximization, risk, cost minimization, employment and wages trade offs.

Assessment Strategies:

Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: RURAL SOCIOLOGY

Code	AAEC 3691
NQF Level	*6*
NQF Credits	*12*

Contact hours	3 lectures per week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Ccontent:
This module investigates the basic sociological concepts and their application to agricultural progress and rural development planning; the significance of rural sociology to agricultural extension and rural development; differences between rural and urban population; culture and culture change, social interaction and social structures; groups and organization, deviance, social class and stratification; Social institutions families; religions; rural/urban migration and environment; social change in global perspective.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: FINANCIAL MANAGEMENT

Code	AAEF 3681
NQF Level	6
NQF Credits	12
Contact Hour	3 lectures per week for 14 weeks; 1 practical for 1 hour alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The course includes issues such as: evaluating and controlling profitability, growth, risk and liquidity in the farm and agribusiness firms, farm accounting records, credit, leverage, capital budgets, and capital costs, capital structure, land acquisition and improvements, and sources of credit and finance; farm financing practical implications (time delays in production, daily interest calculations, timeframe involved in perfection of securities proposed for a specific lending).

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: AGRICULTURAL COMMUNICATION AND GROUP DYNAMICS

Code	AAEA 3681
NQF Level	*6*
NQF Credits	*12*
Contact Hours	3 lectures per week for 14 weeks;1 practical for 2 hours alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The course clarify philosophies, and definition of communication; importance roles and component of communication to change agents; different communication channels and models; Audio-visual aid and public speaking; news reporting articles and newsletters; communication and perception; definition and importance of group; the group as channel of communication; ICT in agriculture (mobile phone, internet and computer usage), group formation and functioning; group techniques; the contribution of Beal, Bohlen and Raudabaugh to group dynamics; Group Norms and cohesion; group goals; Behaviour and attitude in a group; motivation of group; different leadership styles and theories;

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: PRODUCTION ECONOMICS

Code	AAEC 3682
NQF Level	*6*
NQF Credits	*12*
Contact hours	3 lectures per week for 14 weeks and 1hour of practical/week
Prerequisite	CEMI 3571 Basic Microeconomics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This module covers the basic theory of how, what and when firms should produce to maximize profits. Based on the neoclassical theory of the firm presented in most general microeconomic textbooks such as production functions, cost of production, optimum resource allocation, profit maximization, isoquants, product-product relationships, economies of size and scale, it extends the general treatment and focuses on the application of the theory to specific problems that the agricultural firm faces when making production decisions to maximize profits. Technical change is often very expensive equipment in modern production motivates the following focus areas: 1) How to optimize production under restrictions, 2) Treatment of fixed inputs and the process of input fixation, 3) Optimization of production over time, 4) Linear Programming as tools for optimization in practice. Introduce students to the concept of production decisions under risk and uncertainty.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: INTERMEDIATE MACROECONOMICS

Code	AAEI 3682
NQF Level	*6*
NQF Credits	*12*
Contact hours	3 lectures per week for 14 weeks
Prerequisite	CEMA 3572 Basic Macroeconomics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The course includes issues such as: price indices, inflation, real and nominal values, national accounting, determination of aggregate demand and supply, consumption, investment, and savings; it also presents fiscal and monetary policies, government spending, taxation, budget deficits, interest rates, money and banking and balance of payments, employment and business cycles. It provides an overview of the position of the agriculture and fishing sectors in the national economy.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: MATHEMATICAL ECONOMICS AND LINEAR PROGRAMMING

Code	AEC 3612
NQF Level	*6*
NQF Credits	*16*
Contact Hours	4 lectures per week for 14 weeks;1 practical for 1 hour per week for 14 weeks
Prerequisites	SMAT 3511 Basic Mathematics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The course focuses on matrix algebra, functions, differentiation, integration, simplex method and linear programming and their applications to decision making in agricultural economics and business.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 3 hour paper)

E.2.3 THIRD YEAR MODULES

Module Title: FIELD ATTACHMENT I

Code	AACA 3701
NQF Level	*7*
NQF Credits	*8*
Contact Hours	6 weeks of Field Attachment
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content:
This is a practical course where students spend time at real work situations under the supervision of qualified personnel. The students are attached to suitable agricultural businesses and institutions concerned with agricultural economics and rural development and agriculture. During the attachment period University lecturers visit the students to ensure that they are doing practical work as prescribed.

Assessment Strategies
40% (Class oral presentation); 60% (report write up.)

Module Title: ECONOMETRICS

Code	AAEC 3751
NQF Level	*7*
NQF Credits	*16*
Contact Hours	4 lectures per week for 14 weeks; 2 practical hours per week for 14 weeks
Co-requisite	AAEC 3612 Mathematical Economics & Linear Programming
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The course includes issues such as: classical linear regression model, assumptions, model formulation, hypothesis testing, and violation of OLS assumptions, detection and correction of multicollinearlity, autocorrelation, heteroscedascity, functional forms, dummy variables, and estimation using appropriate computer software (e.g. SPSS or STATA)

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 3 hour paper)

Module Title: RESOURCE ECONOMICS

Code	AAER 3781
NQF Level	*7*
NQF Credits	*12*
Contact Hours	3 lectures per week for 14 weeks; 1 practical for 1 hour alternate week for 14 weeks
Prerequisite	AAEl 3681 Intermediate Microeconomics
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The course include issues such as: Natural Resources classification; natural resources issues (efficient utilization, sources of inefficiency –property right, externalities, market and government failure); resource scarcity and sustainability use of natural resources, policies to address efficiency goals; natural resources analysis and valuation (introduction to Cost-Benefit analysis, use and non-use values, and resources valuation techniques –Hedonic Pricing Method, Travel Cost Method and Contingent Valuation Method); application of economics in natural resources management – renewable resources (e.g. fishery, water, forest and land) and non renewable resources (mineral, petroleum or natural gas) use/extraction.

Assessment Strategies

Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: FARM PLANNING AND MANAGEMENT

Code	AAEC 3781
NQF Level	*7*
NQF Credits	*12*
Contact Hours	3 lectures per week for 14 weeks; 1 practical for 1.5 hour every alternate for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The course includes issues such as: management of farm records; machinery; land; labor; and capital, farm business planning, enterprise budgeting, agricultural risk management strategies. Students will be exposed to business planning using spreadsheets.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: DEVELOPMENT ECONOMICS

Code	AAED 3781
NQF Level	*7*
NQF Credits	*12*
Contact Hours	3 lectures per week for 14 weeks; 1 practical for 1 hour alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course is an introduction to the field of development economics, focusing on some keys questions such as: why some countries poor and others rich? Why some countries experienced rapid economic development while others are trapped in poverty? It also reviews policy issues which developing countries can pursue to best address poverty and underdevelopment. These are just few of the many questions that this course will deal with. Last but not the least, the course looks at how international factors such as trade and foreign investment affect a countries economic development.

The course is divided into 3 main parts. PART I: Defining and Measuring Economic Development: the millennium development goals, human development index, measuring inequality, measuring poverty. PART II: Domestic Development Policy: Theories of economic development; human capital and development; rural-urban migration; agricultural markets and development. PART III: International Policies: Trade and development; balance of payment and debt crisis; foreign sources of finance, financial markets and government policy.

Assessment Strategies:
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: RESEARCH METHODOLOGY IN AGRICULTURAL ECONOMICS

Code	AAER 3782
NQF Level	*7*
NQF Credits	*12*
Contact Hours	3 lectures per week for 14 weeks;1 practical for 1 hour per week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The course includes issues such as: identifying research problems, definition research problem, and formulation, data collection, data analysis, presentation and report writing.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: AGRICULTURAL EXTENSION

Code	AAEC 3712
NQF Level	*7*
NQF Credits	*16*
Contact Hours	4 lectures per week for 14 weeks; 1 practical for 1 hour per week for 14 weeks
Prerequisite	AAEC 3691 Rural Sociology
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

The course explore Extension concepts; principles and theories; compare Modern and Traditional Extension; agricultural extension as adult learning; extension methods; definition and importance of program extension; philosophy and principles of program development in extension; Comparing agricultural extension approaches (FSRE); Science and Indigenous knowledge systems and participatory appraisal techniques ; Social change and innovation; Attributes of Innovations and their rate of adoptions; Elements in diffusion of Innovations; Motivational theories; Community participation and involvement in extension, PRA methodologies and techniques; Improving the organisation and management of extension; establishing and strengthening farmer's organisations.

Assessment Strategies

Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 3 hour paper)

Module Title: ENTREPRENEURSHIP

Code	AAEC 3702
NQF Level	*7*
NQF Credits	*8*
Contact Hours	*2 lectures per week for 14 weeks; 1 practical for 1.5 hour alternate week for 14 weeks*
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

The course includes issues such as: types of entrepreneurs, the importance of entrepreneurship and the forces and ideas that lead to business establishment, growth and survival, choice of the option of self-employment (carrying out feasibility studies and writing business plan), entrepreneurial process, the different schools of thought on the sources of entrepreneurship, the entrepreneur's characteristics, traits and motivation; developing entrepreneurial skills (SWOT analysis, business opportunity identification, opportunity assessment and evaluation) the role of entrepreneurship in the economy: the management competencies necessary for business success (planning, organizing, coordinating, operations, directing, leading and controlling), financing a business, Government policies on small business ventures (SME).

Assessment Strategies

Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: AGRICULTURAL PRICE ANALYSIS AND FORECASTING

Code	AAEA 3782
NQF Level	*7*
NQF Credits	*12*
Contact Hours	3 lectures per week for 14 weeks; 2 hours practicals per week for 14 weeks
Co-requisite	AAEC 3731 Econometrics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

In this module students will be exposed to role price, price determination and price discovery, using of index numbers to correct for inflation, analysis of trend (movement of prices over time), least square regression analysis for defining trends and relationship between data series, prices analysis during cycles, measuring cycles, conceptual basis for seasonality, measuring seasonality, estimation of demand and supply function, estimating price discovery models, and causality.

Assessment Strategies

Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: AGRICULTURAL MARKETING

Code	AAEC 3782
NQF Level	*7*
NQF Credits	*12*
Contact hours	3 lectures per week for 14 weeks; 1 Practical for 3 hours every alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The course include issues such as: Agricultural to marketing functions; Price Analysis and the marketing functions (role of price in a competitive economy, relative prices, supply and demand analysis elasticities, price discovery etc.,); Farm and Food Prices; Risk Management and Futures Markets; Models of market behavior (derived demand, derived supply and food and marketing costs/margins; Marketing Research and Planning (SWOT analysis i.e. internal and external environment analysis, marketing mix the 4P's); Spatial characteristics of markets (including marketing constraints in developing countries); Agricultural products markets and supply chain management (supply and demand chain, vertical and horizontal integration, middlemen, agricultural cooperatives); Commodity supply chain analysis; Strategic marketing management.

Assessment Strategies:
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

E.2.4 FOURTH YEAR MODULES

Module Title: FIELD ATTACHMENT II

Code	AACA 3801
NQF Level	*8*
NQF Credits	*8*
Contact Hours	8 practical hours per day for 6 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content:
This is a practical course where students spend time at real work situations under the supervision of qualified personnel. The students are attached to suitable agricultural businesses such the Ministry of Agriculture and Forestry's Green Scheme projects, Meatboard Board of Namibia, Agronomic Board, and institutions concerned with agricultural economics and rural development and agriculture such as the Agricultural Bank of Namibia (AGRIBANK) and the Development Bank of Namibia (DBN). Students are engaged in decision-making exercises, planning, monitoring and evaluation of agricultural extension programmes and plans. Furthermore, they should be engaged in data capturing, analysis report writing and record keeping. During the attachment period University lecturers visit the students to ensure that they are doing practical work as prescribed.

Assessment Strategies
40% (Class oral presentation); 60% (report write up.)

Module Title: RESEARCH PROJECT IN AGRICULTURAL ECONOMICS

Code	AAEC 3810

NQF Level *8*
NQF Credits *32*
Contact Hours 1 hour per week for 28 weeks
Prerequisite AAER 3782 Research Methodology in Agricultural Economics
Compulsory/Elective Compulsory
Semester Offered 1 & 2

Module Content:
Students carry out independent study of a current topic in natural resources and agriculture. The course include participation in meetings organized by the coordinator, work with a faculty advisor to develop a research project, formulate hypotheses, design and carry out preliminary experiments and collect data and test the hypotheses. Students will carry out independent library research, begin experimental work, prepare a written report and make a presentation to other students the proposal and final report. The student will submit a final report written following Guidelines for Scientific Writing.

Assessment Strategies:
Continuous assessment (100%) consisting of research proposal write up and presentation of proposal in a seminar, presentation of empirical findings in a second seminar, and grading of the final report.

Module Title: PROJECT PLANNING AND MANAGEMENT
Code AAEC 3881
NQF Level *8*
NQF Credits *12*
Contact hours 3 lectures per week for 14 weeks; 1 practical for 1.5 hour alternate week for 14 weeks
Prerequisite None
Compulsory/Elective Compulsory
Semester Offered 1
Module Aims:
The course exposes students to principles and applications of project planning and management in agriculture.

Module Content:
The course includes topics such as: planning process, project cycle, logical framework, financial and economic analysis of project; Project feasibility and appraisal techniques (pay back period, the time value of money, Net Present Value, Benefit cost Ratio, and Internal Rate of Return), and sensitivity analysis; Project monitoring and evaluation, leadership, control, and the problems of identifying project costs and benefits and dealing with sustainability in project implementation

Assessment Strategies:
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: INTERNATIONAL AGRICULTURAL TRADE
Code AAEC 3891
NQF Level *8*
NQF Credits *12*
Contact Hours 3 lectures per week for 14 week; 1 practical for 1.5hours alternate week for 14 weeks
Compulsory/Elective Compulsory
Prerequisite None
Semester Offered 1
Module Aims:
The course exposes students to concepts and theories of international agricultural trade and policy for exporting countries and importing countries

Module Content:
The course includes topics such as: agricultural trade policies, role and benefits of international trade, welfare impacts of trade policies, importance of multilateral and regional trade agreements such as WTO, SACU, EPAs, and technical barriers to trade currently shaping international trade.

Assessment Strategies:
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: AGRICULTURAL POLICY ANALYSIS

Code	AAEC 3882
NQF Level	*8*
NQF Credits	*12*
Contact Hours	3 lectures per week for 14 weeks;1 practical for 2 hours per alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The course includes issues such as: policy issues relevant to Namibia, policy intervention and cost and benefits of policy intervention, food security, food quality and food safety policies, agricultural and environment policy, economic evaluation of alternative policies and their application for farmers, consumers and agribusiness.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: AGRIBUSINESS MANAGEMENT

Code	AAEA 3882
NQF Level	*8*
NQF Credits	*12*
Contact Hours	*3 lectures per week for 14 weeks; 1 practical for 1.5 hour alternate week for 14 weeks*
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The course includes issues such as: Agribusiness management process, industry situation analysis and industry attractiveness, methods of analyzing competitiveness, competitive advantages and how to sustain it; strategic management (environmental scanning, strategy formulation, strategy implementation and control; social responsibility and business ethics, human resource management. Case studies of agribusiness or agro-food complex in Southern Africa.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

Module Title: RURAL DEVELOPMENT

Code	AAEC 3842
NQF Level	*8*
NQF Credits	*8*
Contact Hours	2 lectures per week for 14 weeks; 1 practical for 1 hour alternate week for 14 weeks
Prerequisite	AAEC 3712 Agricultural Extension
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The course includes issues such as: rural poverty and deprivation and the major factors in food security and insecurity –access to basic services: education, health, infrastructure, water and safe sanitation; rural development models; integrated rural development; rural employment and unemployment, incomes and livelihoods; land reform and land resettlement practices and challenges; rural cooperatives –challenges and best practices.

Assessment Strategies:
Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

SECOND YEAR AGRICULTURAL ECONOMICS MODULES TAUGHT AS SERVICE MODULES TO OTHER DEPARTMENTS:

Module Title:	PRINCIPLES OF MICROECONMICS
Code	AAEC 3681
NQF Level	6
Contact hours	03 Lecture hours / week for 14 weeks; 02 Practical hours / week for 14 weeks
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The course includes issues such as: introduction to the concept of scarcity, consumer theory, , the theory of the firm under perfect competition, supply and demand, monopoly and other market structures, externalities, and public goods.

Assessment Strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals); Examination: 60% (01 x 02 hours paper)

Module Title:	PRINCIPLES OF MACROECONOMICS
Code	AAEC 3692
NQF Level	6
Contact hours	03 Lecture hours / week for 14 weeks; 03 Practical hours / alternate week for 14 weeks
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content
The course includes issues such as: price indices, inflation, real and nominal values, national accounting, determination of aggregate demand and supply, consumption, investment, and savings; it also presents fiscal and monetary policies, government spending, taxation, budget deficits, interest rates, money and banking and balance of payments, employment and business cycles. It provides an overview of the position of the agriculture and fishing sectors in the national economy.

Assessment Strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals); Examination: 60% (01 x 02 hours paper)

F. B.SC. AGRICULTURE (ANIMAL SCIENCE) HONS [17BSAS]

All modules listed below, except English Communication and Study Skills, English for Academic Purposes and Contemporary Social Issues, will be offered by Faculty of Science. English Communication and Study Skills, English for Academic Purposes, Contemporary Social Issues and Computer Literacy are University Core Modules taken by all First Year University of Namibia students.

F.1 PROGRAMME SCHEDULE

Coursecode	Course name	NQF Level	Credits	Compulsory(C) / Elective (E)	(Co-requisite)/ Pre-requisite
Year 1 Semester 1					
UCLC 3509	Computer Literacy	5	8	C	
ULCE 3419	English Communication and Study Skills	4	16	C	
UCSI 3580	Contemporary Social Issues	5	8	C	
SBLG 3511	Introduction to Biology	5	16	C	
SPHY 3501	Physics for Life Sciences I	5	8	C	
SMAT 3511	Basic Mathematics	5	16	C	
Total Credits Semester 1					72
Year 1 Semester 2					
ULEA 3519	English for Academic Purposes	5	16	C	
SCHM 3532	Chemistry for Life Sciences	5	16	C	
SPHY 3532	Physics for Life Sciences II	5	16	C	
SBLG 3512	Diversity of Life	5	16	C	
Total credits Semester 2					64
TOTAL CREDITS YEAR 1					136

Year 2 Semester 1					
AAEC 3681	Principles of Microeconomics	6	12	C	None
AAEC 3691	Rural Sociology	6	12	C	None
AASC 3681	Genetics	6	12	C	None
AASC 3691	Introduction to Range Management	6	12	C	None
ACRS 3681	Biostatistics	6	12	C	None
AFST 3681	General Microbiology	6	12	C	None
Total Credits Semester 1					72
Year 2 Semester 2					
AAEC 3682	Production Economics	6	12	C	None
AASC 3612	Biochemistry	6	16	C	SCHM 3532 (Chemistry for Life Sciences)
ACSC 3691	Agronomy	6	12	C	None
AASC 3602	Livestock Production Systems	6	8	C	None
AFST 3602	Food Technology	6	8	C	None
Total credits Semester 2					56

TOTAL CREDITS YEAR 2					128
Year 3 Semester 1					
AACA 3701	Field Attachment I	7	8	C	None
AASC 3701	Animal Nutrition	7	8	C	None
ACSE 3781	Agricultural Engineering	7	12	C	None
AASC 3791	Animal Health	6	12	C	FST 3681 (General Microbiology)
AASC 3741	Game Ranching	7	8	C	None
AAEC 3781	Farm Planning and Management	7	12	C	None
AASC 3711	Animal Anatomy & Physiology	7	16	C	None
Total Credits Semester 1					76
Year 3 Semester 2					
ACSC 3792	Research Methods	7	12	C	ACRS 3681 (Biostatistics)
AAEC 3712	Agricultural Extension	7	16	C	None
AASF 3702	Feeds and Feeding	7	8	C	AASC 3701 (Animal Nutrition)
AASC 3792	Animal Breeding	7	12	C	AASC 3681 (Genetics)
AAEC3782	Agricultural marketing	7	12	C	None
AAEC 3702	Entrepreneurship	7	8	C	None
Total credits Semester 2					64
TOTAL CREDITS YEAR 3					140

Year 4 Semester 1					
AACA 3801	Field Attachment II	8	8	C	AACA 3708 (Field Attachment I)
ACSC 3810	Research Project	8	16	C	ACSC 3792 (Research Methods)
AAEC 3881	Project Planning and Management	8	12	C	None
AASC 3811	Range and Pasture Management	8	16	C	None
AASC 3881	Beef Production	8	12	C	None
AASC 3821	Poultry Production	8	8	C	None
Total Credits Semester 1					72
Year 4 Semester 2					
AASC 3810	Research Project	8	16		ACSC 3792 (Research methods)
AASC3892	Small Ruminant Production	8	12	C	None
AASC 3802	Dairy Production	8	8	C	None
AASM 3882	Meat Science	8	12	C	None
AASB 3882	Biotechnology of Animal Reproduction	8	12	C	None
AASC 3822	Pig Production	8	8	C	None
Total credits Semester 2					68
TOTAL CREDITS YEAR 4					140
		TOTAL CREDITS FOR THE PROGRAMME			544

F.2. MODULE DESCRIPTORS

F.2.1 FIRST YEAR MODULES

CLC3509 COMPUTER LITERACY

Module title:	COMPUTER LITERACY
Code:	CLC3509
NQF level:	5
Contact hours:	1 lecture theory and 1 lecture practical per week for 14 weeks
Credits:	8
Module assessment:	Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%
Prerequisites:	University Entry

Module Content:

The module covers the following topics. Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system: File Management, working with multiple programs, using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge. Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the workbook. Databases: creating tables, relationships, queries, forms and reports. Presentation software: slide layout and master, animations, auto-content wizard and templates. Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

LCE3419 ENGLISH COMMUNICATION & STUDY SKILLS

Module title:	ENGLISH COMMUNICATION AND STUDY SKILLS
Code:	LCE3419
NQF Level:	4
Contact hours:	4 hours per week for 14 weeks
Credits:	16
Module Assessment:	Continuous assessment (60%): two tests (reading and writing), two reading assignments, one oral presentation Examination (40%): one three hour examination paper
Pre-requisites:	None

Module Content:

This module is aimed at assisting students in the development of their reading, writing and speaking and listening skills, in order to cope with studying in a new academic environment and in a language which may not be their first language. The module also focuses on study skills that students need throughout their academic careers and beyond. The module serves as an introduction to university level academics, where styles of teaching and learning differ from those at secondary schools in that more responsibility is placed on the student. The module therefore, focuses on the skills that students need throughout their academic careers and beyond.

CSI 3580 CONTEMPORARY SOCIAL ISSUES

Code	CSI 3580
NQF Level	5
Contact hours	Equivalent to 1 hour per week for two semesters (Online)
NQF Credits	8
Prerequisite	None (University Core Module)
Compulsory/Elective	Compulsory
Semester Offered	1 & 2 (Year Module)

Module Descriptor (Rationale of the module):

The module, Contemporary Social Issues (CSI3580), is designed to encourage behavioural change among UNAM students and inculcate the primacy of moral reasoning in their social relations and their academic lives. In providing students with critical and analytical thinking the module enables students to grow and develop into well rounded citizens, capable of solving contemporary social challenges experienced in their communities and societies. The teaching of the module takes three dimensions: the intellectual, the professional and the personal dimensions. The intellectual dimension is fostered through engaging students with subject knowledge, independent learning and module assessment. The professional dimension, on the other hand, is fostered through exposing students to real life situations of case studies and practical exercises that draws attention to social issues that attract ongoing political, public and media attention and/or debate. Finally, the professional dimension is fostered through group work, online discussions and class participation.

SBLG 3511: INTRODUCTION TO BIOLOGY

INTRODUCTION TO BIOLOGY
SBLG 3511
Biology
1A 4
4 lectures/ week for 14 weeks and one 3-hour practical session per week.
Module title: 16
Code:
Course Equivalent: Continuous assessment (40%): Theory (not less than 3 tests and 2 assignments), 40%. Practicals (not
NQF level: Contact less than 10 marked assignment), 60%. Examination (60%): 3 hour examination paper.
hours: Credits: Prerequisites: NSCC (Biology C or better)
Module Content: It will consider organization of life, chemical basis of life, carbohydrates, proteins,
Module assessment: nucleic acids, lipids and fats, water, cell structure and function, prokaryotic and eukaryotic cells, ultra-structure of plant and animal cells, cytoskeleton, membrane structure and function, cell communication, mitosis, meiosis, cell reproduction, cell cycle, and cell death. The following topics will be covered: Introduction to systems of classification, taxonomy and binomial nomenclature, including the five kingdoms and the three domein system. Definitions and categories/groups within the five kingdoms, evolution by natural selection (microevolution vs macroevolution), phylogeny and evolutionary relationships in five kingdoms. The course content will also include genes, chromosomes, genomes, Mendelian genetics, extensions to Mendelian genetics, chromosome theory of inheritance, linkage and cross-over, recombination, sex determination. The course content will also cover an introduction to Ecology: Definitions, history, scales in ecology, application of ecology. Conditions and Resources: Environmental conditions, animals and their resources, plants and their resources.

SPHY 3501: PHYSICS FOR LIFE SCIENCES I

Module title:	PHYSICS FOR LIFE SCIENCES I
Code:	SPHY3501
NQF level:	4
NPSC:	N/A
Contact hours:	28 Lectures and 14 Practical Sessions/Tutorials
Credits:	8
Module assessment:	Continuous Assessment (50%) and 1 x 3-hour Exam Paper (50%). Continuous Assessment will consist of class tests, tutorial tests/assignments and practical reports.
Pre-requisites:	None

Module Content:
This module is to introduce Life science students to physics concepts and applications that will be useful to them in their undergraduate studies and carrier.
The course will cover the following topics:
Units and significant figures; Motion in one dimension, average velocity, acceleration, freely falling bodies; Vectors and scalars, addition and subtraction of vectors in one and two dimensions, multiplication of vectors, component method of vector addition; Projectiles; Force and weight, Newton's laws and applications, free-body diagrams, friction, motion on inclined planes; Uniform circular motion, period and frequency of motion, centripetal force, banking of curves; Newton's law of Universal gravitation, gravity near the Earth's surface, satellites; Kepler's laws; Work done by a constant force, kinetic energy, work-energy theorem, potential energy, conservation of Mechanical energy, power; Momentum, impulse, conservation of energy and momentum in collisions, elastic and inelastic collisions in one dimension.

SMAT 3511: BASIC MATHEMATICS

Module name:	BASIC MATHEMATICS
Code:	SMAT 3511
NQF level:	5
Contact hours:	4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits:	16
Module Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite:	NSSC Mathematics

Module Content:
Sets: notations and diagrams to represent sets, subset, empty set, equality of sets, intersection, union, complement. Algebraic expressions: simplification, expansion, polynomials, reminder and factor theorem, partial fractions. Trigonometry: trigonometric functions, basic trigonometric identities. The absolute value, linear equations, linear inequalities, quadratic equations, the quadratic formula, quadratic inequalities. Functions: domain, codomain, image, preimage, even function, odd function. Sequences: the general term, the geometric sequence, the arithmetic sequence. The Binomial Theorem.

LEA3519 ENGLISH FOR ACADEMIC PURPOSES

Module title:	ENGLISH FOR ACADEMIC PURPOSES
Code:	LEA3519
NQF level:	5
Contact hours:	4 periods per week for 14 weeks
Credits:	16
Module assessment:	Continuous assessment (60%): 2 tests (reading and writing), 1 academic written essay,1 oral presentation Examination (40%) : One three hour examination paper
Prerequisites:	None

Module Content:

This module develops a student's understanding, and competencies regarding academic conventions such as academic reading, writing, listening and oral presentation skills for academic purposes. Students are required to produce a referenced and researched essay written in formal academic style within the context of their university studies. Students are also required to do oral presentations based on their essays. The reading component of the course deals with academic level texts. This involves students in a detailed critical analysis of such texts. The main aim is therefore, to develop academic literacy in English.

SCHM 3532: CHEMISTRY FOR LIFE SCIENCES

Module Title:	CHEMISTRY FOR LIFE SCIENCES
Code:	SCHM3532
NQF Level:	5
Contact Hours:	56 hours of lectures, 42 hours of practical sessions.
Credits:	16
Module Assessment:	CA: 50% (minimum 3 tests 80%, laboratory component 20%, tutorial assignments 10%). Final Exam: 50%; (1 x 3 hour exam paper)
Pre-requisites:	None

Module Content:

Classification of Matter: Mixtures and Pure substances; Physical States of Matter; Physical and Chemical Properties. Extensive and Intensive properties.

Measurements: Units, Significant figures; Precision and Accuracy, Factor Label Method. Atomic structure and the Periodic table; Electron configuration; Physical and Chemical properties as predicted from groups. Ionic compounds and Molecular compounds: Writing chemical formulae and naming of ionic and molecular compounds. Average Atomic Mass. The Mole Concept; Percent Composition, Empirical formula and Molecular formula. Stoichiometry: limiting reagent, percent yield. Solutions: electrolytes and non-electrolytes, aqueous solutions, ionic equations; concentrations: percent concentration; molarity, molality; dilution of solutions; structure and solubility. Types of bonds; Lewis structures; Resonance structures; Molecular geometry: the VSEPR model, Polarity of molecules. Acid-base equilibrium: properties of acids and bases; relations of acids and bases, self ionisation of water; strengths of acids and bases; the pH scale; hydrolysis of salts; buffers; acid-base titration. Introduction to organic chemistry: organic compounds; structural formulae and conformations; functional groups; Classes of hydrocarbons: alkanes, cycloalkanes: alkanes; alkenes and alkynes; oxidation and reduction; addition reactions; stereo-isomerism. Alcohols, phenols, thiols, ethers: organic compounds of oxygen; common alcohols and phenols. Carboxylic acids and esters, amines and amides: Introduction to carbohydrates, lipids and porphyrins.

SPHY 3532: PHYSICS FOR LIFE SCIENCES II

Module Title:	PHYSICS FOR LIFE SCIENCES II
Code:	SPHY 3532
NQF Level:	4
Contact Hours:	4 Lectures per week for 14 weeks, Practical Time: 14 sessions (42 hours)
Credits:	16
Module assessment:	Continuous assessment (50%, Minimum 2 tests, 4 assignments and practical reports) and Examination (50%,1 x 3-hour paper)
Pre-requisites:	NSSC Physical Science
Co-Requisites:	SPHY 3401: Physics for Life Sciences I; SMAT3511: Basic Mathematics; SMAT3512: Pre-calculus;

Module Content:

This module introduces life science students to concepts of physics and their application to real life situations, new topics that were not dealt with in PHY 3101 are introduced (i.e., on electricity, magnetism and radioactivity). The content of this course is good enough to help the life science students throughout their undergraduate work and careers. The following topics will also be covered: Electric charge; insulators and conductors; Electric force and coulomb's law , Electric field and Gauss's law; Electric potential; Capacitance and capacitors; Direct current; Ohm's law and simple circuits; Magnetic field; Alternating current; Transformers; Phenomenological approach to RL and RC circuits; Temperature, gas and thermal expansion; Basic geometrical optics; Radioactivity and its detection.

SBLG 3512: DIVERSITY OF LIFE

Module title:	DIVERSITY OF LIFE
Code:	SBLG 3512
Course Equivalent:	NSSC (/HIGH GRADE) Biology
NQF level:	5
Contact hours:	4 lecture periods / week for 14 weeks and one three hour practical session per week
Credits:	16
Module assessment:	Continuous assessment: Theory (not less than 3 tests and 2 Assignments) 40% Practicals (not less that 10 marked assignments) 50% Examination: 60% (1 x 2 hour examination paper)
Prerequisites:	NSCC (Biology C or better)

Module Content:

This module is designed to give students a detailed understanding of the diversity of life. It gives students the broader appreciation of biodiversity in the different ecological habitats. The course shall describe diagnostic characteristics of principle taxonomic categories for each phylum. Coverage of each Phylum shall follow a phylogenetic (evolutionary) approach as well as introduce broad ecological and physiological principles. Various aspects of reproduction and development shall be highlighted. This module prepares students to understand subsequent courses such as Introduction to Ecology and Microbiology, Population Ecology, Comparative physiology, Biogeography, Plant and Animal Form and Function

Topics covered will include viral, bacterial, fungal, algal, animal and plant diversity. It then considers the characteristics and life cycles of the following important algae, animal and plant groups: Chlorophyta, Phaeophyta, Rhodophyta, Chrysophyta, Euglenophyta, Pyrrophyta, Cryptophyta, Protostomate phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostomate phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chodrichthyes, Actinopterygii, Actinistia, Dipnoi, Amphibia, Reptilia, Aves, Mammalia) bryophytes, seedless vascular plants, gymnosperms, and the angiosperms. Concepts such as Homology and analogy; body symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered.

Examples from Namibia shall be used where possible and applicable. The course content shall be supplemented with appropriate weekly practical sessions in the laboratory and in the field.

(Although the above information has been compiled as accurately as possible, the Faculty of Agriculture and Natural Resources cannot be held responsible for any errors and/or omissions which may occur in the above module descriptors of modules offered by other Departments.)

F.2.2 SECOND YEAR MODULES

Module Title: GENETICS

Code	AASC 3681
NQF Level	*6*
NQF Credits	*12*
Contact Hours	3 x 1 hour Lectures / week for 14 weeks (42hours); Practicals: 1X 3 hour s /fort weekly for 7 weeks (21 hours)
Prerequisite	Introduction to Biology (BLG 3411)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

This cource introduce and presents principles and methods used in the study of genetics. The emphasis is on application of concepts to solve problems. The course provides a foundation for more advanced studies in the field of agriculture and veterinary medicine. The specific topics to be covered are:

The molecular structure of nucleic acids (DNA and RNA) and gene expression: The double helix model of DNA; Transcription, Translation and the Genetic Code; Regulation of gene expression – the *Lac* operon; DNA replication in prokaryotes and eukaryotes.

Extension of Mendelian analysis and ratio: Incomplete dominance; co-dominance; multiple allelism; gene interactions; pleiotropy; epistasis; lethal genes, additive gene action.

Chromosomal basis of heredity: Physical structure of chromosomes and DNA Packaging; Karyotypes and Variations; gene linkage; genetic mapping.

Introduction to Quantitative Genetics: Polygenic inheritance; Analysis of polygenic traits; Heritability
Other topics to be covered include: The molecular organization of prokaryotic and eukaryotic genomes; Molecular structure of genes; The Cell Cycle; Mitosis and its genetic significance; Meiosis and its genetic significance; Mutations (types, causes, detection and significance); Sex determination; Sex linkage; sex-limited and sex-influenced.
The module also introduces students to molecular biology techniques: Genetic engineering or recombinant DNA technology; DNA extraction; Polymerase Chain Reaction (PCR); DNA electrophoresis and sequencing; gene cloning; animal cloning and marker-assisted selection.

Assessment Strategies
Continuous Assessment: 40% (2 tests + at least 5x marked practicals / assignments).
Exam: 60% (1 x2 hour paper).

Module Title: INTRODUCTION TO RANGE MANAGEMENT

Code	AASC 3691
NQF Level	*6*
NQF Credits	*12*
Contact hours:	3 x 1 hour Lecturers / week for 14 weeks; 03 Practical hours alternate weeks for 14 weeks
Prerequisite	
Compulsory/Elective	Compulsory
Semester Offered	1

Module ontent:
This introductory module develops the students' understanding, skills and attitude regarding rangeland resources and principles of rangeland management through coverage of the following: Background and role of rangelands in Namibia, objectives of range management; Basic range terminologies; Identification of the major forage species; Grazing value and ecological status of grasses; Veld types in the farming areas of Namibia, rainfall map, soil types of Namibia, agro-ecological zones; Biotic and abiotic factors affecting rangelands, effect of climate change on rangeland condition; introduction to rangeland restoration, Sustainable range management in Namibia.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals).
Exam: 60% (1 x2 hr paper)

Module Title: BIOCHEMISTRY

Code	AASC 3612
NQF Level	*6*
NQF Credits	*16*
Contact Hours	4 x 1 hour Lectures / week for 14 weeks (56 hours); Practicals: 1X 3 hours /fort weekly for 7 weeks (21 hours)
Prerequisite	Chemistry for Life Sciences (CHM3532)
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Under this course the students will learn about:

PHYSICAL BIOCHEMISTRY: Acids, bases, buffers, pH, ionic strength, molarity; water (structure and ionization).
STRUCTURAL BIOCHEMISTRY: Structure and function of macromolecules (carbohydrates, proteins and lipids), Vitamins, Coenzymes and Cofactors.
ENZYMOLOGY:(Enzymes as organic catalysts; Enzyme nomenclature; Factors affecting activities of enzymes; Enzyme kinetics - The Michaelis-Menten equation; The Lineweaver-Burk plot; Enzyme inhibition; Allosterism.
BIOENERGETICS AND THERMODYNAMICS: Free Energy, Laws of Energy, Activation Energy, Transition States, Endergonic and exergonic reactions.
METABOLISM: Catabolism and Anabolism; Carbohydrate catabolism (Glycolysis, Alcohol and lactic acid Metabolism, Tricarboxylic acid cycle or the TCA cycle; Electron transport chain and oxidative phosphorylation); Regulation of carbohydrate metabolism; Gluconeogenesis; Synthesis of the disaccharides (lactose and sucrose); Synthesis of polysaccharides (starch and glycogen); Lipid metabolism (β-oxidation, malonly CoA); Integration of carbohydrate and fat metabolism; Amino acids and protein metabolism; Urea cycle; The Cori cycle; Pentose phosphate pathway; Glyoxylate cycle in oily seeds.
SPECTROPHOTOMETRY: Fundamental laws of spectrophotometry and absorbance.

Assessment Strategies
Continuous Assessment: 40% (2 tests + at least 5x marked practicals / assignments).
Exam: 60% (1 x3 hour paper).

Module Title: LIVESTOCK PRODUCTION SYSTEMS

Code	AASC 3602
NQF Level	*6*
NQF Credits	*8*
Contact hours:	2 x 1 hour Lectures / week for 14 weeks; 03 Practical hours alternate weeks for 14 weeks
Prerequisite	
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This module covers the role of livestock and agriculture in the national economy and gives a broad overview of the industry, potentials, competitiveness and constraints. It covers the different production systems, their impacts on the environment, productivity levels and sustainability. Coverage also includes breed and species adaptability to the environments; drought and its effects; the management of ruminants and non-ruminants with regard to breeding, nutrition, health and housing; livestock management facilities; harvesting, handling and marketing of livestock products. The module also discusses the constraints facing communal and commercial farmers in Namibia

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5x marked practicals).
Exam: 60% (1 x2 hr paper)

F.2.3 THIRD YEAR MODULES

Module Title: FIELD ATTACHMENT I

Code	AACA 3701
NQF Level	*7*
NQF Credits	*8*
Contact Hours	6 weeks of Field Attachment
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content:
This is a practical course where students spend time at real work situations under the supervision of qualified personnel. The students are attached to suitable agricultural businesses and institutions concerned with agricultural economics and rural development and agriculture. During the attachment period University lecturers visit the students to ensure that they are doing practical work as prescribed.

Assessment Strategies
40% (Class oral presentation); 60% (report write up.)

Module Title: ANIMAL NUTRITION

Code	AASC 3701
NQF Level	*7*
Notional Hours	80
NQF Credits	*8*
Contact hours:	2 x 1 hour Lectures / week for 14 weeks; 03 Practical hours alternate weeks for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This module introduces students to basic animal nutrition including key concepts and terminologies and the role of animal nutrition in animal production. The module exposes students to different topics relating to animal nutrition of various livestock species, laboratory feeds analysis and feed evaluation; general comparison of plants, animals and animal feeds; plants and animals as feed sources with special focus on nutritive values, availability, affordability and laws associated with the use of either; feed fractions and their nutritional implications; digestive system and physiology of farm animals; digestibility and degradability experiments; use of near infrared Reflectance (NIR) Spectroscopy, spectrophotometer in animal nutrition; use of feed value estimates and; mineral and vitamin nutrition.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5x marked practicals); Exam: 60% (1 x2 hr paper)

Module Title: ANIMAL HEALTH

Code	AASC 3791
NQF Level	*7*
Notional Hours	80
NQF Credits	*12*
Contact hours:	3 x 1 hour Lectures / week for 14 weeks; 03 Practical hours / week for 14 weeks
Prerequisite	FST 3681 (General Microbiology)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
VIRAL DISEASES: Gumboro Disease, Newcastle Disease, Rabies, FMD, Bovine Malignant Catarrhal Fever, Lumpy Skin Disease (LSD), African Swine Fever, Orf. PRION DISEASES: Bovine Spongiform Encephalopathy. BACTERIAL DISEASES: Anthrax, Mastitis, Brucellosis, Anaplasmosis, Heartwater, Contagious Bovine Pleuropneumonia, Caseous Lymphadenitis. NUTRITIONAL AND METABOLIC DISORDERS: Piglet anaemia, Bloat, Milk fever, Traumatic reticuloperitonitis (TRP), Phytotoxicosis (plant poisoning) in Namibia. PARASITOLOGY: -Host-parasite relationship, types of host, sources and carriers, sources of infection, modes of transmission and entry of parasites, harmful effects of parasites, iimmunity in parasitic infections, antibody response in parasite infections, Antigenic variation, Immunotolerance PROTOZOAN DISEASES: Coccidiosis, Trichomoniasis, Babesiosis, Anaplasmosis, Toxoplasmosis, Trypanosomiasis. HELMINTHIASIS: Ascariasis, Parasitic gastroenteritis (PGE), Trichinellosis, Cysticercosis, *Stilezia hepatica*, Echinococcosis, ECTOPARASITES: Mange, Sarcoptic, Chorioptic, Demodecosis. Ticks – hard and soft ticks, Lice, Flies, Fleas,

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5x marked practicals); Exam: 60% (1 x2 hr paper)

Module Title: GAME RANCHING

Code	AASC 3741
NQF Level	*7*
Notional Hours	80
NQF Credits	*8*
Contact hours:	2 x 1 hour Lectures / week for 14 weeks; 03 Practical hours alternate weeks for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

Roles of Game Ranching at the farm level & contribution to the national economy; Ethics & reasons for conserving & preserving game animals; Comparative productivity indices of selected game and domestic animals; Challenges and constraints to Game Ranching; Ecological roles, social behaviours and peculiar characteristics/identification of game species of interest i.e. small & large herbivores, carnivores, dangerous game & game birds; Eco-zones where game could be an economic asset; Game ranch management including selecting a suitable game farm; Converting a livestock ranch into a game farm; Game habitat identification & evaluation, carrying capacity & stocking rates; Practising a crude form of grazing rotation & habitats utilization through the use of fence, fire, water & licks; Fire; Water provision; Look-out posts/towers; Dietary supplementation; Basic concepts on game population

dynamics & monitoring; Game counting including mathematical computations; Effect of diseases and parasites on game populations; Systems of production and their economic returns; Consumptive and non-consumptive utilization of game animals; Game capture, infrastructure and transportation including legal and operational requirements; Meat and trophy processing with special focus on animal skinning, preparation of trophies & final trophy handling and, by-products; Importance, establishment & legal requirements of game conservancies; Game farm economics: Development capital, running costs & profitability, general trends and; Markets and marketing.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 10 marked practicals).
Exam: 60% (1 x2 hr paper)

Module Title: ANIMAL ANATOMY AND PHYSIOLOGY

Code	AASC 3711
NQF Level	*7*
Notional Hours	160
NQF Credits	*16*
Contact Hours	4 x 1 hour Lectures per week; practicals: 4 hr per week. Duration of 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The course deals with the concepts pertaining to the morphology function of the circulatory, respiratory, nervous, skeletal and locomotory systems of farm animals (ruminants, mono-gastric animals, and poultry). The anatomical and functional interrelationship of these systems and their embryonic development with special reference to their progenitors and derivatives are discussed. Practical classes that involve the use of carcass dissections, examination of internal organs in dead animals, and the study of laboratory models, help in the understanding of theoretical concepts discussed in the lectures.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5x marked practicals).
Exam: 60% (1 x3 hr paper)

Module Title: FEEDS AND FEEDING

Code	AASF 3702
NQF Level	*7*
NQF Credits	*8*
Contact Hours	2 x 1 hour Lectures / week for 14 weeks; 02 Practical hours alternate week for 14 weeks
Co-requisite	Animal Nutrition (AASC 3701)
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This module introduces students to basic feeds and feeding concepts and terminologies. They will learn about livestock feeds and feed resources classification such as browse, cakes/concentrates, crop residues, hays, silages, supplements e.g. energy, protein, mineral & vitamins and, feed additives will be covered; comparative nutritional values of different feedstuffs; analysis and effects of phenolics, tannins and other anti-quality factors in animal feeding; acquaint students to ways of improving feeding value of low quality feedstuffs; nutrient requirements of farm animals for maintenance, growth, reproduction and other productive functions; significance and use of feeding standards & tables; applied animal feeding & ration formulation including livestock feeding systems, ration formulation methods & feed mixing for different farm animals; feed intake regulation and prediction; diagnosis, treatment and prevention of metabolic disorders.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals). Exam: 60% (1 x2 hr paper)

Module Title: ANIMAL BREEDING

Code	AASC 3792
NQF Level	*7*
NQF Credits	*12*
Contact Hours	3 x 1 hour Lectures / week for 14 weeks; 02 Practical hours alternate week for 14 weeks

Prerequisite	Genetics (AASC 3601)
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This module covers the application of population and quantitative genetics principles to the improvement of livestock and poultry. Concepts in population genetics including change in gene frequencies as the basis for livestock improvement by selection, Hardy-Weinberg equilibrium, forces that change gene frequencies are discussed. The module covers: causes of variation, measures of variation, variance partitioning; estimation of heritability; correlations between traits; principles of selection; genetic relationships. The practical application of the principles of selection are discussed emphasizing genetic evaluation using BLUP, methods of breed improvement by selection and utilization of different mating systems in beef cattle, dairy cattle, swine, sheep and goats. Advances in molecular genetics and their application to breeding are also covered including: types of genetic markers (RFLPs, microsatellites, SNPs); uses of DNA technologies (marker assisted selection, gene introgression); major genes affecting ovulation rate in sheep; QTL for internal nematode resistance in sheep.

Assessment Strategies
Continuous Assessment: 40% (7 x assignments + 2 tests + 1 written report).
Exam: 60% (1 x2 hr paper)

F.2.4 FOURTH YEAR MODULES

Module Title: FIELD ATTACHMENT II

Code	AACA 3801
NQF Level	*8*
NQF Credits	*8*
Contact Hours	8 practical hours per day for 6 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content:
This is a practical course where students spend time at real work situations under the supervision of qualified personnel. The students are attached to suitable agricultural businesses such the Ministry of Agriculture and Forestry's Green Scheme projects, Meatboard Board of Namibia, Agronomic Board, and institutions concerned with agricultural economics and rural development and agriculture such as the Agricultural Bank of Namibia (AGRIBANK) and the Development Bank of Namibia (DBN). Students are engaged in decision-making exercises, planning, monitoring and evaluation of agricultural extension programmes and plans. Furthermore, they should be engaged in data capturing, analysis report writing and record keeping. During the attachment period University lecturers visit the students to ensure that they are doing practical work as prescribed.

40% (Class oral presentation); 60% (report write up.)

Module Title: RESEARCH PROJECT

Code	AASC 3810
NQF Level	*8*
NQF Credits	*32*
Contact hours:	32 hours
Prerequisite	CSC 3792: Research Methods
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content: Research based.
Methods of facilitation of learning
Lectures, written assignments, group work, class discussions and presentations.

Assessment Strategies
Continuous Assessment: Continuous assessment 40% (oral presentation) 60% Project write-up

Module Title: RANGE AND PASTURE MANAGEMENT

Code	AASC 3811
NQF Level	*8*
NQF Credits	*16*
Contact Hours	4 x 1 hour Lectures per week; practicals: 4 hr per week. Duration of 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This module develops the students' understanding, skills and attitude regarding range and pasture management through coverage of the following: Namibian range types and their characteristics; Overview of the carrying capacity of Namibian range types and carrying capacity determination; Morphology of common range plants including structure of a grass plant; Flowering, stem & leaf development, elongation and tillering; Growth cycle of plants and plant & seed dormancy; Introduction to systematic botany with special focus on Annuals & Perennials range plants, C_3 vs. C_4, shrubs, trees & bushes; Plant succession, retrogression and die-back rate of selected range plants; Factors influencing succession; State & transition models; Animal-plant interactions on range: Animal-plant interface; The role of animal breed/size, dentition/digestive system vs. diet preference; Role of faeces, urine and trampling on range plants; Plant adaptation to herbivory; Grazing systems & stocking rates; Continuous and rotational including multi-camp, non-selective & controlled selective grazing; Deferment; Zonal/centripetal grazing; Range degradation: Bush encroachment, overgrazing, desertification and erosion; Land reclamation/restoration. Range evaluation and monitoring; Range condition & trend assessment; Fodder flow management and forage conservation.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals).
Exam: 60% (1 x3 hr paper)

Module Title: BEEF PRODUCTION

Code	AASC 3881
NQF Level	*8*
Notional Hours	160
NQF Credits	*12*
Contact Hours	3 x 1 hour Lectures per week; practicals: 2 hr per alternate week. Duration of 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This module familiarizes students with the Namibian beef industry including its importance, legal and policy framework, Namibia's trade partners in meat, opportunities and challenges faced by the industry. The module develops the students' understanding and skills in the following topics: Beef cattle breeds and systems of production; Major feeding systems including supplementary feeding and potential nutritional & metabolic disorders; Requisite facilities & equipment for a beef ranch; Beef cattle breeding and selection with special focus on bio-economic traits, quality attributes of a beef animal; breeding objectives in beef cattle; Commercial beef cattle breeding programmes including straight breeding, rotational crossbreeding, terminal sire system; Continuous versus restricted breeding; winter vs summer mating systems; AI vs natural service; Herd structures, grouping and replacement; Calving & calf management including dystocia and assisted calving; Sound beef cattle husbandry practices; Beef cattle growth, feed conversion ratio and efficiency; Diseases and parasites; Marketing, grading & transportation of beef animals; Hide processing and quality; Performance and progeny testing; Planning a beef cattle enterprise and; Livestock & livestock products traceability including FAN Meat Scheme.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals).
Exam: 60% (1 x2 hr paper)

Module Title: POULTRY PRODUCTION

Code	AASC 3821
NQF Level	*8*
NQF Credits	*8*
Contact hours:	2 x 1 hour Lectures / week for 14 weeks; 03 Practical hours alternate weeks for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course covers theoretical and practical aspect of poultry production including production systems, routine management, feeding requirements of different classes of chicken (chicks, growers, finishers, layers), health, breeding and housing. Aspects of reproduction including egg formation and embryo development, egg incubation and hatching are also covered. Common diseases, disease prevention and control, special attention will be focused on emerging disease threats (e.g. Avian influenza). Industry stratification (breeding companies, multipliers and producers) and vertical integration (production, marketing and processing) will also be discussed. Coverage of recent developments in the Namibian poultry industry will expose the students challenges and opportunities in the sector.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals).
Exam: 60% (1 x2 hr paper)

Module Title: SMALL RUMINANT PRODUCTION

Code	AASC 3882
NQF Level	*8*
NQF Credits	*12*
Contact Hours	3 x 1 hour Lectures / week for 14 weeks; 02 Practical hours / week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This module familiarizes students with the Namibian small stock industry including its importance, legal and policy framework, Namibia's trade partners in meat, opportunities and challenges. The module also covers breed characteristics of sheep and goats, production systems, requisite facilities and equipment. Students are introduced to concepts pertaining to feeding habits of sheep and goats, grazing management and systems and the nutrient requirement of sheep and goats. The module further covers animal selection and breeding, including breeding/mating seasons and methods/systems, flock composition and selection of replacement animals. The module develops the students' understanding in lambing/kidding management including dystocia and fostering. Students are expected to conduct practicals in animal husbandry techniques. Coverage also includes selecting the right animals for marketing, marketing costs, marketing channels, transportation and slaughter, livestock traceability, processing of skins, animal welfare and health.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals).
Exam: 60% (1 x2 hr paper)

Module Title: DAIRY PRODUCTION

Code	AASC 3802
NQF Level	*8*
NQF Credits	*8*
Contact hours:	2 x 1 hour Lectures / week for 14 weeks; 02 Practical hours alternate weeks for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory

Semester Offered 2

Module Content:
This module will cover: dairy herd health management; routine management practices on a dairy farm; dairy cattle feeding; management of pregnant and dry cows, bulls calves and heifers; breeding and breeding efficiency; farm records; physiology of lactation; milk harvesting, factors which affect milk yield and composition, production of high quality milk and quality control in milk and milk products. It will also look at milk marketing and dairy animal health. Dairy development trends in Namibia will also be covered.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals).
Exam: 60% (1 x2 hr paper)

Module Title: MEAT SCIENCE

Code	AASM 3882
NQF Level	*8*
NQF Credits	*12*
Contact Hours	3 x 1 hour Lectures / week for 14 weeks; 02 Practical hours / week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The module covers: muscle physiology; growth and carcass composition of meat animals; slaughter procedures for pigs, sheep, cattle and poultry; postmortem changes in muscle and its conversion into meat, identification of wholesale and retail cuts. Coverage also includes abattoir hygiene with emphasis on the importance of abattoir hygiene, microbiology, general layout and construction, personal hygiene, handling of waste and condemned material, pest control and sanitation. Topics such as meat hygiene, spoilage and preservation and basic meat processing are also covered. The module develops the students' understanding of physical, sensory and chemical meat quality as well as the factors affecting quality. The module also provides students with knowledge on the principles of quality management systems: Good Manufacturing Practices (GMP's); food safety; food hygiene and sanitation, food laws and regulations; codex alimentarius; Hazard Analysis Critical Control Point (HACCP) and ISO 9001:2000. Consumer concerns regarding the consumption of meat are also discussed.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 10 marked practicals).
Exam: 60% (1 x2 hr paper)

Module Title: BIOTECHNOLOGY OF ANIMAL REPRODUCTION

Code	AASB 3882
NQF Level	*8*
NQF Credits	*12*
Contact Hours	3 x 1 hour Lectures / week for 14 weeks; 03 Practical hours alternate weeks for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This module aims to develop the students' understanding, skills and attitude regarding the application of Biotechnology of Animal Reproduction through a coverage of genetic engineering in domestic animals including: introduction to the methods applied in biotechnological of animal reproduction; the use of biotechnology for animal selection; methods applied in genetic engineering; gene transfer through its insertion into zygote nucleolus; the importance and use of embryo transfer in domestic animals; theoretic and practical procedures oestrous synchronization and embryo transfer; the use of reproductive hormonal compounds for triggering multiple ovulation; regulation of herd oestrous cyclicity and/or oestrous synchronization; method applied for triggering superovulation; artificial insemination and factors affecting successful fertilization; factors affecting effective hormonal action; oocyte retrieval and fertilization; embryo retrieval, evaluation and grading; embryo dissections and cryopreservation or transfer; sperm and embryo cryopreservation; the mechanism of embryo cryopreservation and thawing; theoretic and practical aspects of embryo microsurgery; methods of embryo sexing; factors affecting embryo survival rate after cryopreservation and transfer; the effect of donor synchrony and recipient asynchrony in embryo transfer,

immune-genetic aspects of embryo and respective female recipient, veterinary aspects taken into consideration in embryo donor and recipient selection. Precautions in embryo transfer, in vitro maturation and in vitro fertilization; theoretical aspects of cloning;

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals).
Exam: 60% (1 x2 hr paper)

Module Title: PIG PRODUCTION

Code	AASC 3822
NQF Level	*7*
NQF Credits	*8*
	2 x 1 hour Lectures / week for 14 weeks; 03 Practical hours alternate weeks
Contact hours:	for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Contents:
Students will be introduced to methods of pig farming in both intensive and extensive systems. The module will cover routine management practices, feeding, herd health, animal behavior and welfare, housing and marketing. Feed resources and systems of feeding will also be covered. Additional coverage shall be on factors influencing profitability of pig enterprises and trends in the pig industry worldwide and in Namibia.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals); Exam: 60% (1 x2 hr paper)

G. B.SC. AGRICULTURE (CROP SCIENCE) HONS (Ogongo Campus) [17BSCS]

All modules listed below, except English Communication and Study Skills, English for Academic Purposes and Contemporary Social Issues, will be offered by Faculty of Science. English Communication and Study Skills, English for Academic Purposes, Contemporary Social Issues and Computer Literacy are University Core Modules taken by all First Year University of Namibia students.

G.1 PROGRAMME SCHEDULE

Course code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 1 Semester 1					
ULCE 3419	English for Communication and Study Skills	4	8	C	
UCL3509	Computer Literacy	5	16	C	
UCSI 3580	Contemporary Social Issues	5	8	C	
SBLG 3511	Introduction to Biology	5	16	C	
SPHY 3501	Physics for Life Sciences I	5	8	C	
SMAT 3511	Basic Mathematics	5	16	C	
Total Credits Semester 1			72		
Year 1 Semester 2					
ULEA 3519	English for Academic Purposes	5	16	C	
SCHM 3532	Chemistry for Life Sciences	5	16	C	
SPHY 3532	Physics for Life Sciences II	5	16	C	
SBLG 3512	Diversity of Life	5	16	C	
SMAT 3512	Pre-calculus	5	16	C	
Total credits Semester 2			80		
TOTAL CREDITS YEAR 1			152		

Year 2 Semester 1					
AAEC 3681	Principles of Microeconomics	6	12	C	None
AAEC 3691	Rural Sociology	6	12	C	None
AASC 3681	Genetics	6	12	C	None
ACRS 3681	Biostatistics	6	12	C	None
ACSC 3681	Plant Science	6	12	C	None
ACSC 3691	Agronomy	6	12	C	None
Total Credits Semester 1			72		
Year 2 Semester 2					
AAEC 3682	Production Economics	6	12	C	None
AAEC 3692	Principles of Macroeconomics	6	12	C	None
AASC 3612	Biochemistry	6	16	C	SCHM 3532 (Chemistry for Life Sciences)
AASC 3602	Livestock Production Systems	6	8	C	None
ACRS 3682	Soil Science for Crop Production	6	12	C	None
Total credits Semester 2			64		
TOTAL CREDITS YEAR 2			136		

Year 3 Semester 1					
ACSE 3781	Agricultural Engineering	7	12	C	None
ACSC 3791	Field Crop Production	7	12	C	ACSC 3681 (Plant Science)

ACSC 3721	Weed Science	7	8	C	None
AACA 3701	Field Attachment I	7	8	C	None
ACSC 3741	Horticulture I—Vegetables, Herbs and Spices	7	8	C	ACSC 3681 (Plant Science) and ACSC 3691 (Agronomy)
ACRS 3781	Plant Breeding	7	12	C	AASC 3681 (Genetics)
AAEC 3781	Farm Planning and Management	7	12	C	None
Total Credits Semester 1			72		
Year 3 Semester 2					
ACSC 3792	Research Methods	7	12	C	ACRS 3681 (Biostatistics)
ACSC 3702	Crop Ecophysiology	7	8	C	ACSC 3681 Plant Science
ACSC 3722	Crop Handling and Storage	7	8	C	None
ACSC 3742	Farm mechanisation	7	8	C	ACSE 3781 (Agricultural Engineering)
AAEC 3712	Agricultural Extension	7	16	C	None
AAEC 3782	Agricultural Marketing	7	12	C	None
Total credits Semester 2			64		
TOTAL CREDITS YEAR 3			136		

Year 4 Semester 1					
ACSC 3810	Research Project	8	16	C	ACSC 3792 (Research Methods)
AACA 3801	Field Attachment II	8	8	C	None
ACSC 3841	Seed Science and Technology	8	8	C	CSC 3681 (Plant Science)
ACSC 3861	Agricultural Entomology	8	8	C	None
ACSC 3881	Soil Fertility and Plant Nutrition	8	12	C	ACRS 3682 (Soil Science for Crop Production)
AAEC 3881	Project Planning and Management		12	C	None
Total Credits Semester 1			64		
Year 4 Semester 2					
ACSC 3810	Research Project	8	16	C	ACSC 3792 (Research Methods)
ACSC 3892	Horticulture II—Fruit Crops and Ornamental Plants	8	12	C	ACSC 3681 (Plant Science)
ACSC 3802	Plant Pathology	8	8	C	None
ACSC 3822	Plant Biotechnology	8	8	C	AASC 3681 (Genetics)
ACSC 3812	Soil Conservation and Irrigation	8	16	C	ACRS 3682 (Soil Science for Crop Production)
Total credits Semester 2			60		
TOTAL CREDITS YEAR 4			120		
	TOTAL CREDITS FOR THE PROGRAMME		544		

G.2 MODULE DESCRIPTORS

G.2.1 FIRST YEAR MODULES

CLC3509 COMPUTER LITERACY

Module Title:	COMPUTER LITERACY
Code:	CLC3509
NQF level:	5
Contact hours:	1 lecture theory and 1 lecture practical per week for 14 weeks
Credits:	8
Module assessment:	Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%
Prerequisites:	University Entry

Module Content:
The module covers the following topics. Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system: File Management, working with multiple programs, using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge. Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the workbook. Databases: creating tables, relationships, queries, forms and reports. Presentation software: slide layout and master, animations, auto-content wizard and templates. Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

LCE3419 ENGLISH COMMUNICATION & STUDY SKILLS

Module Title:	ENGLISH COMMUNICATION AND STUDY SKILLS
Code:	LCE3419
NQF Level:	4
Contact hours:	4 hours per week for 14 weeks
Credits:	16
Module Assessment:	Continuous assessment (60%): two tests (reading and writing), two reading assignments, one oral presentation Examination (40%): one three hour examination paper
Pre-requisites:	None

Module Content:
This module is aimed at assisting students in the development of their reading, writing and speaking and listening skills, in order to cope with studying in a new academic environment and in a language which may not be their first language. The module also focuses on study skills that students need throughout their academic careers and beyond. The module serves as an introduction to university level academics, where styles of teaching and learning differ from those at secondary schools in that more responsibility is placed on the student. The module therefore, focuses on the skills that students need throughout their academic careers and beyond.

CSI 3580 CONTEMPORARY SOCIAL ISSUES

Code	CSI 3580
NQF Level	5
Contact hours	Equivalent to 1 hour per week for two semesters (Online)
NQF Credits	8
Prerequisite	None (University Core Module)
Compulsory/Elective	Compulsory
Semester Offered	1 & 2 (Year Module)

Module Descriptor (Rationale of the module):

The module, Contemporary Social Issues (CSI3580), is designed to encourage behavioural change among UNAM students and inculcate the primacy of moral reasoning in their social relations and their academic lives. In providing students with critical and analytical thinking the module enables students to grow and develop into well rounded citizens, capable of solving contemporary social challenges experienced in their communities and societies. The teaching of the module takes three dimensions: the intellectual, the professional and the personal dimensions. The intellectual dimension is fostered through engaging students with subject knowledge, independent learning and module assessment. The professional dimension, on the other hand, is fostered through exposing students to real life situations of case studies and practical exercises that draws attention to social issues that attract ongoing political, public and media attention and/or debate. Finally, the professional dimension is fostered through group work, online discussions and class participation.

SBLG 3511: INTRODUCTION TO BIOLOGY

Module Title:	INTRODUCTION TO BIOLOGY
Code:	SBLG 3511
Course Equivalent:	Biology 1A
NQF level:	4
Contact hours:	4 lectures/ week for 14 weeks and one 3-hour practical session per week.
Credits:	16
Module assessment:	Continuous assessment (40%): Theory (not less than 3 tests and 2 assignments), 40%. Practicals (not less than 10 marked assignment), 60%. Examination (60%): 3 hour examination paper.
Prerequisites:	NSCC (Biology C or better)

Module Content:

It will consider organization of life, chemical basis of life, carbohydrates, proteins, nucleic acids, lipids and fats, water, cell structure and function, prokaryotic and eukaryotic cells, ultra-structure of plant and animal cells, cytoskeleton, membrane structure and function, cell communication, mitosis, meiosis, cell reproduction, cell cycle, and cell death. The following topics will be covered: Introduction to systems of classification, taxonomy and binomial nomenclature, including the five kingdoms and the three domein system. Definitions and categories/groups within the five kingdoms, evolution by natural selection (microevolution vs macroevolution), phylogeny and evolutionary relationships in five kingdoms. The course content will also include genes, chromosomes, genomes, Mendelian genetics, extensions to Mendelian genetics, chromosome theory of inheritance, linkage and cross-over, recombination, sex determination. The course content will also cover an introduction to Ecology: Definitions, history, scales in ecology, application of ecology. Conditions and Resources: Environmental conditions, animals and their resources, plants and their resources.

SPHY 3501: PHYSICS FOR LIFE SCIENCES I

Module Title:	PHYSICS FOR LIFE SCIENCES I
Code:	SPHY3501
NQF level:	4
NPSC:	N/A
Contact hours:	28 Lectures and 14 Practical Sessions/Tutorials
Credits:	8
Module assessment:	Continuous Assessment (50%) and 1 x 3-hour Exam Paper (50%). Continuous Assessment will consist of class tests, tutorial tests/assignments and practical reports.
Pre-requisites:	None

Module Content:

This module is to introduce Life science students to physics concepts and applications that will be useful to them in their undergraduate studies and carrier.

The course will cover the following topics:

Units and significant figures; Motion in one dimension, average velocity, acceleration, freely falling bodies; Vectors and scalars, addition and subtraction of vectors in one and two dimensions, multiplication of vectors, component method of vector addition; Projectiles; Force and weight, Newton's laws and applications, free-body diagrams, friction, motion on inclined planes; Uniform circular motion, period and frequency of motion, centripetal force, banking of curves; Newton's law of Universal gravitation, gravity near the Earth's surface, satellites; Kepler's laws; Work done by a constant force, kinetic energy, work-energy theorem, potential energy, conservation of Mechanical energy, power; Momentum, impulse, conservation of energy and momentum in collisions, elastic and inelastic collisions in one dimension.

SMAT 3511: BASIC MATHEMATICS

Module Title:	BASIC MATHEMATICS
Code:	SMAT 3511
NQF level:	5
Contact hours:	4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits:	16
Module Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite:	NSSC Mathematics

Module Content:

Sets: notations and diagrams to represent sets, subset, empty set, equality of sets, intersection, union, complement. Algebraic expressions: simplification, expansion, polynomials, reminder and factor theorem, partial fractions. Trigonometry: trigonometric functions, basic trigonometric identities. The absolute value, linear equations, linear inequalities, quadratic equations, the quadratic formula, quadratic inequalities. Functions: domain, codomain, image, preimage, even function, odd function. Sequences: the general term, the geometric sequence, the arithmetic sequence. The Binomial Theorem.

LEA3519 ENGLISH FOR ACADEMIC PURPOSES

Module title:	ENGLISH FOR ACADEMIC PURPOSES
Code:	LEA3519
NQF level:	5
Contact hours:	4 periods per week for 14 weeks
Credits:	16
Module assessment:	Continuous assessment (60%): 2 tests (reading and writing), 1 academic written essay,1 oral presentation Examination (40%) : One three hour examination paper
Prerequisites:	None

Module Content:

This module develops a student's understanding, and competencies regarding academic conventions such as academic reading, writing, listening and oral presentation skills for academic purposes. Students are required to produce a referenced and researched essay written in formal academic style within the context of their university studies. Students are also required to do oral presentations based on their essays. The reading component of the course deals with academic level texts. This involves students in a detailed critical analysis of such texts. The main aim is therefore, to develop academic literacy in English.

SCHM 3532: CHEMISTRY FOR LIFE SCIENCES

Module Title:	CHEMISTRY FOR LIFE SCIENCES
Code:	SCHM3523
NQF Level:	5
Contact Hours:	56 hours of lectures, 42 hours of practical sessions.
Credits:	16
Module Assessment:	CA: 50% (minimum 3 tests 80%, laboratory component 20%, tutorial assignments 10%). Final Exam: 50%; (1 x 3 hour exam paper)
Pre-requisites:	None

Module Content:

Classification of Matter: Mixtures and Pure substances; Physical States of Matter; Physical and Chemical Properties. Extensive and Intensive properties.

Measurements: Units, Significant figures; Precision and Accuracy, Factor Label Method. Atomic structure and the Periodic table; Electron configuration; Physical and Chemical properties as predicted from groups. Ionic compounds and Molecular compounds: Writing chemical formulae and naming of ionic and molecular compounds. Average Atomic Mass. The Mole Concept; Percent Composition, Empirical formula and Molecular formula. Stoichiometry: limiting reagent, percent yield. Solutions: electrolytes and non-electrolytes, aqueous solutions, ionic equations; concentrations: percent concentration; molarity, molality; dilution of solutions; structure and solubility. Types of bonds; Lewis structures; Resonance structures; Molecular geometry: the VSEPR model, Polarity of molecules. Acid-base equilibrium: properties of acids and bases; relations of acids and bases, self ionisation of water; strengths of acids and bases; the pH scale; hydrolysis of salts; buffers; acid-base titration. Introduction to organic chemistry: organic compounds; structural formulae and conformations; functional groups; Classes of hydrocarbons: alkanes, cycloalkanes: alkanes; alkenes and alkynes; oxidation and reduction; addition reactions; stereo-isomerism. Alcohols, phenols, thiols, ethers: organic compounds of oxygen; common alcohols and phenols. Carboxylic acids and esters, amines and amides: Introduction to carbohydrates, lipids and porphyrins.

SPHY 3532: PHYSICS FOR LIFE SCIENCES II

Module Title:	PHYSICS FOR LIFE SCIENCES II
Code:	SPHY 3532
NQF Level:	4
Contact Hours:	4 Lectures per week for 14 weeks, Practical Time: 14 sessions (42 hours)
Credits:	16
Module assessment:	Continuous assessment (50%, Minimum 2 tests, 4 assignments and practical reports) and Examination (50%,1 x 3-hour paper)
Pre-requisites:	NSSC Physical Science
Co-Requisites:	SPHY 3401: Physics for Life Sciences I; SMAT3511: Basic Mathematics; SMAT3512: Pre-calculus;

Module Content:

This module introduces life science students to concepts of physics and their application to real life situations, new topics that were not dealt with in PHY 3101 are introduced (i.e., on electricity, magnetism and radioactivity). The content of this course is good enough to help the life science students throughout their undergraduate work and careers. The following topics will also be covered: Electric charge; insulators and conductors; Electric force and coulomb's law , Electric field and Gauss's law; Electric potential; Capacitance and capacitors; Direct current; Ohm's law and simple circuits; Magnetic field; Alternating current; Transformers; Phenomenological approach to RL and RC circuits; Temperature, gas and thermal expansion; Basic geometrical optics; Radioactivity and its detection.

SBLG 3512: DIVERSITY OF LIFE

Module Title:	DIVERSITY OF LIFE
Code:	SBLG 3512
Course Equivalent:	NSSC (/HIGH GRADE) Biology
NQF level:	5
Contact hours:	4 lecture periods / week for 14 weeks and one three hour practical session per week
Credits:	16
Module assessment:	Continuous assessment: Theory (not less than 3 tests and 2 Assignments) 40% Practicals (not less that 10 marked assignments) 50% Examination: 60% (1 x 2 hour examination paper)
Prerequisites:	NSCC (Biology C or better)

Module Content:

This module is designed to give students a detailed understanding of the diversity of life. It gives students the broader appreciation of biodiversity in the different ecological habitats. The course shall describe diagnostic characteristics of principle taxonomic categories for each phylum. Coverage of each Phylum shall follow a phylogenetic (evolutionary) approach as well as introduce broad ecological and physiological principles. Various aspects of reproduction and development shall be highlighted. This module prepares students to understand subsequent courses such as Introduction to Ecology and Microbiology, Population Ecology, Comparative physiology, Biogeography, Plant and Animal Form and Function

Topics covered will include viral, bacterial, fungal, algal, animal and plant diversity. It then considers the characteristics and life cycles of the following important algae, animal and plant groups: Chlorophyta, Phaeophyta, Rhodophyta, Chrysophyta, Euglenophyta, Pyrrophyta, Cryptophyta, Protostomate phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostomate phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chodrichthyes, Actinopterygii, Actinistia, Dipnoi, Amphibia, Reptilia, Aves, Mammalia) bryophytes, seedless vascular plants, gymnosperms, and the angiosperms. Concepts such as Homology and analogy; body symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered.

Examples from Namibia shall be used where possible and applicable. The course content shall be supplemented with appropriate weekly practical sessions in the laboratory and in the field.

SMAT 3512: PRE-CALCULUS

Module Title:	PRE-CALCULUS
Code:	SMAT 3512
NQF level:	5
Contact hours:	4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits:	16
Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite:	NSSC Mathematics

Module Content:

Functions: one-to-one and onto functions, horizontal line test, composition of functions, inverse of a function. Introduction to exponential and logarithmic functions. Limit of a function: definition, left and right limits, infinite limits, limits at infinity, continuity in terms of limits. Differentiation: rate of change, derivative of a function, rules of differentiation, increasing and decreasing functions and graph sketching. Integration: antiderivatives, the definite integral, area under a graph. Trigonometry: further trigonometric identities, area of a sector and segment of a circle, derivatives and integrals of trigonometric functions.

(Although the above information has been compiled as accurately as possible, the Faculty of Agriculture and Natural Resources cannot be held responsible for any errors and/or omissions which may occur in the above module descriptors of modules offered by other Departments.)

G.2.2 SECOND YEAR MODULES

Module Title:	PLANT SCIENCE
Code NQF Level	ACSC 3681 6
Contact hours NQF	03 Lecture hours / week for 14 weeks; 02 Practical hours / week for 14 weeks
Credits Prerequisite	12
Compulsory/Elective	None
Semester Offered	Compulsory 1

Module Content
Plant Taxonomy: binomial system, use of taxonomic keys. Anatomy of angiosperms; cell types, tissues types. Morphology and anatomy of root, stem, leaves, flowers, fruits. Types of inflorescences. Pollination: process, methods. Double fertilization. Agriculturally important plant families. Photosynthesis: chemistry, energy requirements, C3/C4 plants. Respiration and photorespiration. Water: importance, uptake, transpiration, water potential and tugor pressure. Translocation: sources and sinks. Nutrient uptake and transport: passive and active transport. Plant growth regulators.

Assessment Strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	BIOSTATISTICS
Code	ACRS 3681 6
NQF Level	3 lecture hours / week for 14 weeks; 3 tutorial / practical hours alternate weeks for
Contact hours	14 12
NQF Credits	
Prerequisite	SMAT 3511 Basic Mathematics
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Definition of statistics, descriptive and inferential statistics. Qualitative and quantitative data, primary versus secondary data. Sampling and sample size determinations, and replications. Presentation of data: tables, charts, graphs. Measures of central tendency: mean, mode, median. Measures of dispersion: standard deviation, coefficient of variation, standard error. Probability, Bayes' theorem, combinations and permutations, Binomial, Poisson, and Normal distributions, T-test and F- distribution mean comparisons, Analysis of variance, analysis assumptions. Single and multiple factor experiments, correlation and linear regression, transformations. Research process: research problem formulation, research objectives, hypothesis formulation. Basic experimental designs: completely randomized, randomized complete block, Latin square, Split plot.

Assessment Strategies
Continuous assessment (40%): at least three assessments; Examination (60%): 01 x 02 hour examination paper

Module Title:	AGRONOMY
Code	ACSC 3691
NQF Level	6
Notional Hours	80
Contact hours	02 Lecture hours / week for 14 weeks;,03 Practical hours / week for 14 weeks (alternate)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content
Choice of land for different crops. Environmental factors affecting crop choice: temperature, rainfall, solar radiation, photoperiodism. Time of planting; pre- and post-rain planting. Land preparation: aims, tillage systems—conventional, minimum, conservation tillage. Review of tillage and cultivation equipment for large-scale and small-scale farmers. Seeding: factors affecting seed quality, seeding depth, seeding rate, plant population. Fertilizer application times and methods. Calculation of row and intra-row spacing and fertilizer rates. Cultural practices for weed control. Harvesting: physiological maturity and harvest maturity, harvest index. Cropping systems—monoculture, mixed culture and intercropping.

Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper

Module Title:	SOIL SCIENCE FOR CROP PRODUCTION
Code NQF Level	ACRS 3682 6
Contact hours NQF	03 Lecture hours / week for 14 weeks; 02 Practical hours / week for 14 weeks
Credits Prerequisite	12 None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content

Definition of soil. Soil formation. Soil as a triphasic system: texture, soil organic matter, soil organisms and nutrient cycles. Clay minerals, soil colloids and cation exchange capacity; Soil structure. Bulk density. Soil moisture, soil water potential and movement in saturated and unsaturated soils; field capacity and water holding capacity. Basics of soil fertility and plant nutrition: macro- and micro-nutrients and their functions, pH and nutrient availability. Soil classification: soil profile, horizons, and influence of environmental factors. Common soil classification systems: USDA (soil taxonomy) and FAO classification systems. Major soil types

Assessment Strategies

Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

G.2.3 THIRD YEAR MODULES

Module Title:	FIELD CROP PRODUCTION
Code NQF Level	ACSC 3791 7
Contact hours NQF	03 Lecture hours / week for 14 weeks; 02 Practical hours / week for 14 weeks
Credits Prerequisite	12 ACSC 3681 Plant Science
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

Cereals crops (pearl millet, maize, wheat, sorghum, rice), oilseed crops (sunflower, soybean, groundnut, caster bean), grain legumes (cowpea, bambara nuts, kidney beans), fiber crops (cotton, sisal), root and tuber crops (sweet potatoes, cassava, Irish potatoes) grown in Namibia: their importance to the economy, uses, soil and climatic requirements and production practices. Areas where grown, limitations to production

Assessment Strategies

Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	AGRICULTURAL ENGINEERING
Code NQF Level Contact hours	ACSE 3781 7 03 Lecture hours / week for 14 weeks 02 Practical hours / week for 14 weeks
NQF Credits	12 None
Prerequisite	Compulsory
Compulsory/Elective	1
Semester Offered	

Module Content:

Fundamentals of Engineering; Farm Power sources; Internal Combustion Engines, electricity, wind energy, solar energy. Tractors. Machinery for different operations: Tillage; Planting; Cultivation; Harvesting. Land Surveying; Water Resources; Soil and Water Conservation (Processes of Erosion; Conservation Methods); Irrigation and Drainage; Post Harvest Handling, Storage and Processing; Farm Structures, workshop safety and technology.

Assessment Strategies

Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	HORTICULTURE I—VEGETABLES, HERBS AND SPICES
Code	ACSC 3741
NQF Level	7
Contact hours	02 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
NQF Credits	8
Prerequisite	ACSC 3681 Plant Science and ACSC 3691 Agronomy
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Importance of vegetables and to human nutrition and the economy. Vegetable nursery establishment and management, transplanting. Specific environment requirements of vegetables. Specifics in cultivation systems of vegetables. Plant growth regulators and their use in commercial horticulture: improvement of fruit set; modification of sex ratios, parthenogenesis. Main vegetables – fruit vegetables, root vegetables, leaf vegetables, perennial vegetables, leguminous vegetables – their propagation, cultivation, harvest and handling. Indigenous vegetables: plant domestication and adaptation principles. Hydroponics: hydroponics principles and infrastructure. Mushroom production: cultivation technology of common mushroom species. Spices, medicinal and pharmaceutical plants: most common medicinal species – their propagation, cultivation and utilization. Harvesting of vegetable crops: properties of vegetable commodities: moisture content, shelf life.

Module Title:	WEED SCIENCE
Code	ACSC 3721
NQF Level	7
Contact hours	2 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Assessment Strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Content:
History of weed science. Characteristics and effects of weeds. Weed identification and classification. Weed biology and ecology; propagation, growth, seed dormancy. Weed-crop competition, allelopathy, interference. Weed control practices: preventive, mechanical, biological, cultural, chemical, integrated weed management. Herbicides: effect on plants, selectivity, fate in soil, application and safety, regulation, environmental impact. Herbicide resistance.

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	FIELD ATTACHMENT I
Code	AACA 3701
NQF Level	7
Contact hours	6 weeks
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Students will be attached to agricultural enterprises or organisations, such as farms and research stations to participate in physical work and management of operations taking place. Academic staffs will pay field visits to students to discuss with them and their supervising officers on site the knowledge obtained and areas of exposure needing improvement.

Assessment Strategies
Final assessment 100% (Attachment report and Oral Presentation)

Module Title:	PLANT BREEDING
Code	ACRS 3781
NQF Level	7
Contact hours	03 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
NQF Credits	12
Prerequisite	AASC 3681 Genetics
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content
Aims of plant breeding: Yield improvement, yield stability, biotic and abiotic stress tolerance and resistance, nutritional quality. Germplasm sources and maintenance: importance of genetic diversity, centres of diversity, wild relatives, ex situ and in situ gene banks, CGIAR plant conservation and improvement system, germplasm conservation methods. Plant reproduction mechanisms: inbreeding mechanisms-cleistogamy, flower closure, etc; out breeding mechanisms-dioecy, monoecy, male sterility, incompatibility, sex separation in time; clonally propagated crops. Inbreeding depression, hybrid vigour. Selection theory. Common conventional breeding procedures for inbreeding and out breeding crops—pedigree selection, mass selection, backcrossing, mass selection, simple recurrent selection, selection for hybrid production. Cultivars evaluation. Overview of novel breeding techniques: mutageniesis, haploid and polyploidy plants, somaclonal variation, marker assisted selection and gene transfer.

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	RESEARCH METHODS
Code	ACSC 3792
NQF Level	7
Contact hours	03 lecture hours / week for 14 weeks; 3 tutorial hours / practical hours alternate weeks for 14 weeks
NQF Credits	12
Co-requisite	ACRS 3681: BIOSTATISTICS
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Students will be exposed to more advanced statistical concepts and research methods above those covered in Biostatistics. Comparison between parametric and non-parametric statistics. Non-parametric statistics: goodness of fit tests; tests of association, Chi Square tests; paired comparisons, Wilcoxon's tests; rank correlation; Multivariate methods: multiple regression, discriminant analysis, canonical analysis, multidimensional scaling, principal component analysis. Review of experimental designs with emphasis to livestock, crop and game animal experimentation. Review of procedures for implementing research projects and presentation of research results with emphasis to practical field situations and case studies. Introduction to Statistical Computer packages

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	CROP ECOPHYSIOLOGY
Code	ACSC 3702
NQF Level	7
Contact hours	02 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
NQF Credits	8
Pre-requisite	ACSC 3681 Plant Science
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Growth analysis. Factors affecting growth and development: light penetration into crop, amount and quality of light. Factors affecting transpiration. Development, differentiation and yield. Yield components and their limitations: Law of the minimum. Water potential. Water use efficiency. Biological nitrogen fixation. Factors affecting germination, dormancy. Factors affecting root growth and distribution. Factors affecting leaf and stem growth, branching.

Flowering. Maturation and ripening. Senescence and abscession. Physiology of stress – abiotic (heat, acidity, water) and biotic stresses.

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	CROP STORAGE AND HANDLING
Code	ACSC 3722
NQF Level	7
Contact hours	02 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
NQF Credits	8
Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The Post-harvest system: Post-harvest systems for various crops. Properties of crop commodities: Physical, mechanical and thermal properties of crops which affect their storage and handling. Crop drying. Energy required for drying. Natural drying, Artificial drying, Psychometrics. Equilibrium moisture relationships, Behaviour of moisture in grain bulk/stacks. Moisture content determination. Moisture metre calibration. Types and maintenance of driers: Safe temperatures for drying.Drying methods. Psychometrics.Types of driers.Types of farm storage structures: Silos, sheds, warehouses and open stacks, bunkers, Management of storage facilities. Stacking and movement of commodities. Storage losses including loss assessment methods. Review of Biology of Storage Pests and Pest Infestation Control.Processing of agricultural crops: Threshing. Shelling. Milling. Threshing and shelling efficiency Oil expression
Rice threshing at Ogongo Handling and storage of horticultural and perishable Crops: Causes of losses e.g. physiological changes, mechanical damage, pests and diseases. Quality assessment. Conservation techniques for horticultural crops.Material handling equipment: Material movement into and within storage structures for large scale structures: Folk lift, Screw conveyor, Belt conveyor, Bucket elevator, Pneumatic conveyor

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	FARM MECHANISATION
Code	ACSC 3742
NQF Level	7
Contact hours	02 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
NQF Credits	8
Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Fundamental quantities and units. Concepts of work, Power and Torque. Animal Power (Hitching, harvesting, capability, training), Machine Power (The Tractor. The internal combustion engine and other sub-systems; Power Trains: Tractor tests and Performance. Operation and maintenance; Safety), Natural Power (Solar, wind). Tillage: Primary tillage; secondary tillage: implement types and their operation. Crop planting, fertilization and weed control: Equipment types and operation, calibration and safety aspects. Crop Harvesting: Objective, combine harvester-types and operation. Farm Machinery Management: Machine capacity, performance and costs. Machinery cost and selection.

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

G.2.4 FOURTH YEAR MODULES

Module Title: RESEARCH PROJECT

Code	ACSC 3810
NQF Level	16
Contact hours	Equivalent to 1 hour per week for 28 weeks
NQF Credits	32
Pre-requisite	ACSC 3792: Research Methods
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content
Senior undergraduate students carry out independent study of a current topic in Agriculture and related fields. The course includes participation in meetings organized by the coordinator, work with a faculty advisor to develop a research project, formulate hypotheses, design and carry out experiments and collect data and test the hypotheses. Students will carry out independent library research, begin experimental work, prepare a written report and make a presentation to other students of the research proposal and a final presentation of the preliminary results. The student will submit a final report written following Guidelines for Scientific Writing.

Module Title:	FIELD ATTACHMENT II
Code	AACA 3801
NQF Level	8
Contact hours	6 weeks
NQF Credits	8
Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This module is designed to further expose students to the realities of farming and agro-industry operations in Namibia. They are expected to observe and participate in different facets of production, processing, marketing, extension and assist with management functions e.g. supervision of general work force and problem solving. Academic staffs will pay field visits to students to discuss with them and their supervising officers on site the knowledge obtained and areas of exposure needing improvement.

Module Title:	SEED SCIENCE AND TECHNOLOGY
Code	ACSC 3841
NQF Level	8
Contact hours	02 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
NQF Credits	8
Pre-requisite	ACSC 3681 Plant Science
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Importance of quality seed for crop production. Review of cultivar development: selection methods, variety evaluation and release. Types of cultivars: purelines, hybrids, synthetics, open pollinated populations. DUS-test. Seed ecology: review of plant growth and seed development: growth factors affecting seed quality. Seed germination and Seed dormancy. Seed multiplication: organization, suitable areas, and agronomy. Harvesting and threshing methods. Processing: drying, cleaning, treatment, grading. Storage: packaging, factors affecting storage: packaging, factors affecting storage life. Seed quality control: legislation, certification, inspection, testing. Marketing and distribution: demand forecasting, supply, pricing. Seed production of important crops of Namibia.

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	AGRICULTURAL ENTOMOLOGY
Code	ACSC 3861
NQF Level	8
Contact hours	02 Lecture hours / week for 14 weeks
	03 Practical hours / alternate week for 14 weeks
NQF Credits	8
Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Effects of insects on crops. Insect structures and life cycles: Body parts, maintenance and locomotion, sensory organs, reproduction. Insect classification economically important insect orders. Grouping of insect in relation to host damage and pest control: chewing insects, piercing and sucking insects. Population dynamics: Economic threshold. Insect sampling techniques: transects, traps, mark-release-recapture. Causes of success of insects. Insect control measures: preventative, chemical, cultural, biological, physical, integrated insect control. History and classification of insecticides: organochlorine insecticides, Organophosphorus insecticides, carbamates, pyrethroids, insecticide resistance. Integrated pest management. Environmental issues related to insecticides: effects on food chain, persistent insecticides, banned insecticides, environmental protection legislation and enforcement. Field pests of horticultural and field crops in Namibia. Pests of stored crops in Namibia.

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	SOIL FERTILITY AND PLANT NUTRITION
Code	ACSC 3881
NQF Level	8
Contact hours	03 Lecture hours / week for 14 weeks
	02 Practical hours / week for 14 weeks
NQF Credits	12
Pre-requisite	ACRS 3682 Soil Science for Crop Production
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Soil organic matter: carbon cycle, CO_2 global warming, bioassay, response to management practices. Review of plant nutrients: macronutrients, micronutirents. . Functions of each nutrients in plant metabolism and growth. Review of basic soil chemistry concepts: soil pH and nutrient availability, soil colloids and cation exchange. Solubility equilibria as applied to nutrient and solubility and movement. Mobility of major nutrients in the soil and in the plant. Salinity: meaning measurement and amendment. Soil acidity and alkalinity and amendment: liming requirements. Fertilizers: nutrients content, solubility, fertilizer formulations, losses; types of fertilizers—single fertilizers, compound fertilizers, Law of the minimum. Soil and plant analysis. Integrated nutrient management. Brief overview of nutrient deficiency symptoms.

Module Title:	HORTICULTURE II—Fruit Crops and Ornamental Plants
Code	ACSC 3892
NQF Level	8
Notional Hours	120
Contact hours	03 Lecture hours / week for 14 weeks
	03 Practical hours / alternate week for 14 weeks
NQF Credits	12
Pre-requisite	ACSC 3681 Plant Science
Compulsory/Elective	Compulsory
Semester Offered	2

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Content:
Fruit and Nut production: Importance of fruits and nuts to human nutrition and the economy. Plant propagation techniques applicable to fruit species: seed propagation: genetic segregation and disadvantages of seed propagation for fruit and ornamental plants; uniformity, consistent quality and vegetative—stem cuttings, air layering, grafting, in vitro culture plantlets. Specific environmental requirements of fruit trees. Specifics in cultivation systems of fruit trees. Tree nursery management. Main tropical and subtropical fruit species – their propagation, cultivation, harvest and handling. Indigenous fruit species: propagation and adaptation challenges. Stimulants – coffee, tea, cocoa – their propagation, cultivation, harvest and handling. Pollination requirements for some fruit tree species: importance of bees, establishment and maintenance of bee colonies. Fruit and nut harvesting: properties of fruits

and nuts in respect to handling and shelf life. Ornamental and landscape plants – most common indoor and outdoor ornamental species – their propagation, cultivation and utilization. Use of plant growth regulators in fruit and ornamental plants.

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	PLANT PATHOLOGY
Code	ACSC 3802
NQF Level	8
Contact hours	02 Lecture hours / week for 14 weeks 02 Practical hours / alternate week for 14 weeks
NQF Credits	8
Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Definition of disease. Life cycles and dispersal of fungi and bacteria. Viruses. Parasite-host interactions: antibiosis. Characteristics of major groups of plant pathogenic fungi, bacteria and viruses. Plant disease epidemiology. Methods for assessing crop losses. Methods of control: agronomic, tolerant or resistant crops and cultivars, fungicides used, seed treatment. Classification of fungicides. Effects of fungicides on environment. Biological control. Costs/benefits of control methods.

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Title:	PLANT BIOTECHNOLOGY
Code	ACSC 3822
NQF Level	8
Notional Hours	80
Contact hours	02Lecture hours / week for 14 weeks 02 Practical hours / alternate week for 14 weeks
NQF Credits	8
Pre-requisite	AASC 3681 Genetics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Plant tissue culture – concept of totipotency, culture media composition and environmental conditions. Micro-propagation. Direct and indirect organogenesis and non-zygotic embryogenesis, somaclonal variation and in vitro mutagenesis. Embryo rescue. Protoplast culture and regeneration. Production of haploid plants. Production of secondary metabolites. Cryopreservation. DNA isolation and amplification (PCR). Molecular analysis of DNA, RNA, and proteins. Basics of marker assisted selection. Recombinant DNA. Direct and indirect gene transfer. GMO's and bio-safety: issues relating to bio-safety, international bio-safety protocols, bio-safety legislation and regulation in Namibia.

Assessment strategies
continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

Module Content:
Soil conservation: Causes of and types of soil erosion in Namibia. Estimating soil losses (Measurement and Prediction). Erosion and control methods: Agronomic and mechanical control, Gully erosion control and wind erosion control. Soil Conservation Planning. Conservation agriculture. Land evaluation, Topographic Survey; Water Resources; Irrigation: Irrigation Agronomy Crop water requirements; irrigation water requirements, Irrigation Engineering: Planning and irrigation project, choosing an irrigation method. Operation and management of Surface irrigation, sprinkler irrigation and Trickle/drip irrigation. Irrigation scheduling. Alternatives to irrigation (water harvesting). Problem soil management and reclamation. Drainage of irrigated land.

Assessment Strategies
Continuous Assessment: 40% (1x assignments + 2 tests + at least 3 marked practicals).
Exam: 60% (1 x3 hr paper)

H. B.SC. AGRICULTURE (FOOD SCIENCE & TECHNOLOGY) HONS [17BSFS]

All modules listed below, except English Communication and Study Skills, English for Academic Purposes and Contemporary Social Issues, will be offered by Faculty of Science. English Communication and Study Skills, English for Academic Purposes, Contemporary Social Issues and Computer Literacy are University Core Modules taken by all First Year University of Namibia students.

H.1 PROGRAMME SCHEDULE

Course Code	Course name	NQF Level	Credits	Compulsory (C) /Elective (E)	(Co-requisite)/Pre-requisites
Year 1 Semester 1					
UCLC 3509	Computer Literacy	5	8	C	None
ULCE 3419	English Communication and Study Skills	4	16	C	None
UCSI 3580	Contemporary Social Issues	5	8	C	None
SBLG 3511	Introduction to Biology	4	16	C	None
SPHY 3501	Physics for Life Sciences I	5	8	C	None
SMAT 3511	Basic Mathematics	5	16	C	None
Total Credits Semester 1					72
Year 1 Semester 2					
ULEA 3519	English for Academic Purposes	5	16	C	None
SCHM 3532	Chemistry for Life Sciences	5	16	C	None
SPHY 3532	Physics for Life Science II	5	16	C	None
SBLG 3512	Diversity of Life	5	16	C	None
SMAT3512	Pre-calculus	5	16	C	None
Total credits Semester 2					80
TOTAL CREDITS YEAR 1					152

Year 2 Semester 1					
AAEC 3681	Principles of Microeconomics	6	12	C	None
AAEC 3691	Rural Sociology	6	12	C	None
ACRS 3681	Biostatistics	6	12	C	None
AASC 3681	Genetics	6	12	C	None
AFST 3681	General Microbiology	6	12	C	None
AFST 3691	Post-Harvest Technology	6	12	C	None
AFST 3601	Human Nutrition	6	8	C	None
Total Credits Semester 1					80
Year 2 Semester 2					
AASC 3612	Biochemistry	6	16	C	SCHM3532 (Chemistry for Life Sciences)
AFST 3682	Fruits and Vegetable Technology	6	12	C	None
AASC 3602	Livestock Production Systems	6	8	C	None
AFST 3602	Food Technology	6	8	C	None
AFST 3692	Food	6	12	C	

	Biotechnology				
Total Credits Semester 2					56
TOTAL CREDITS YEAR 2					136

Year 3 Semester 1					
AACA 3701	Field Attachment I	7	8	C	None
AFST 3781	Food Chemistry	7	12	C	ASC 3612 (Biochemistry)
AFST 3791	Food Microbiology	7	12	C	FST 3681 (General Microbiology)
AFST 3701	Product Development and Sensory Evaluation	7	8	C	None
AFSC 3791	Food Processing Technology	7	12	C	AFST 3602 (Food Technology)
AFSC 3781	Meat Science & Technology	7	12	C	FST 3602 (Food Technology)
Total Credits Semester 1					62
Year 3 Semester 2					
ACSC3792	Research Methods	7	12	C	ACRS3681 (Biostatistics)
AFST 3702	Food Toxicology	7	8	C	FST 3781 Food Chemistry
AFST 3722	Food Analysis and Instrumentation	7	8	C	None
AAEC 3702	Entrepreneurship	7	8	C	None
AFSC 3782	Principles of Food Engineering	7	12	C	None
AAEC 3782	Agricultural Marketing	7	12	C	None
Total Credits Semester 2					60
TOTAL CREDITS YEAR 3					122

Year 4 Semester 1					
AFST 3810	Research Project	8	16	C	CSC 3792 (Research Methods)
AACA 3801	Field Attachment II	8	8	C	None
AFST 3841	Quality Management Systems	8	8	C	FST 3602 (Food Technology)
AFST 3881	Dairy Science & Technology	8	12	C	FSC 3791 (Food Processing Technology)
AFST 3891	Applied Food Engineering	8	12	C	FSC 3782 Principles of Food Engineering
AFST 3861	Food Packaging, Storage & Distribution	8	8	C	None
Total Credits Semester 1					62
Year 4 Semester 2					
AFST 3810	Research Project	8	16	C	CSC 3792 (Research Methods)
AFST 3862	Sea Foods Technology	8	8	C	FST 3602 (Food Technology)
AFST 3882	Cereal Science & Technology	8	12	C	None

AFSC 3802	Edible Fats & Oils Technology	8	8	C	FST 3781 (Food Chemistry)
AAEA 3882	Agric. Business Management	8	12	C	None
AFST 3822	Plant Equipment & Management	8	8	C	FSC 3791 (Food Processing Technology)
Total Credits Semester 2					64
TOTAL CREDITS YEAR 4					126
TOTAL CREDITS FOR THE PROGRAMME					536

H.2 MODULE DESCRIPTORS

H.2.1 FIRST YEAR MODULES

CLC3509 COMPUTER LITERACY

Module title: COMPUTER LITERACY
Code: CLC3509
NQF level: 5
Contact hours: 1 lecture theory and 1 lecture practical per week for 14 weeks
Credits: 8
Module assessment: Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%
Prerequisites: University Entry

Module Content:
The module covers the following topics. Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system: File Management, working with multiple programs, using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge. Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the workbook. Databases: creating tables, relationships, queries, forms and reports. Presentation software: slide layout and master, animations, auto-content wizard and templates. Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

LCE3419 ENGLISH COMMUNICATION & STUDY SKILLS

Module title: ENGLISH COMMUNICATION AND STUDY SKILLS
Code: LCE3419
NQF Level: 4
Contact hours: 4 hours per week for 14 weeks
Credits: 16
Module Assessment: Continuous assessment (60%): two tests (reading and writing), two reading assignments, one oral presentation Examination (40%): one three hour examination paper
Pre-requisites: None
Module Content:
This module is aimed at assisting students in the development of their reading, writing and speaking and listening skills, in order to cope with studying in a new academic environment and in a language which may not be their first language. The module also focuses on study skills that students need throughout their academic careers and beyond. The module serves as an introduction to university level academics, where styles of teaching and learning differ from those at secondary schools in that more responsibility is placed on the student. The module therefore, focuses on the skills that students need throughout their academic careers and beyond.

CSI 3580 CONTEMPORARY SOCIAL ISSUES

Code CSI 3580
NQF Level 5
Contact hours Equivalent to 1 hour per week for two semesters (Online)
NQF Credits 8
Prerequisite None (University Core Module)
Compulsory/Elective Compulsory
Semester Offered 1 & 2 (Year Module)

Module Descriptor (Rationale of the module):

The module, Contemporary Social Issues (CSI3580), is designed to encourage behavioural change among UNAM students and inculcate the primacy of moral reasoning in their social relations and their academic lives. In providing students with critical and analytical thinking the module enables students to grow and develop into well rounded citizens, capable of solving contemporary social challenges experienced in their communities and societies. The teaching of the module takes three dimensions: the intellectual, the professional and the personal dimensions. The intellectual dimension is fostered through engaging students with subject knowledge, independent learning and module assessment. The professional dimension, on the other hand, is fostered through exposing students to real life situations of case studies and practical exercises that draws attention to social issues that attract ongoing political, public and media attention and/or debate. Finally, the professional dimension is fostered through group work, online discussions and class participation.

SBLG 3511: INTRODUCTION TO BIOLOGY

Module title:	INTRODUCTION TO BIOLOGY
Code:	SBLG 3511
Course Equivalent:	Biology 1A
NQF level:	4
Contact hours:	4 lectures/ week for 14 weeks and one 3-hour practical session per week.
Credits:	16
Module assessment:	Continuous assessment (40%): Theory (not less than 3 tests and 2 assignments), 40%. Practicals (not less than 10 marked assignment), 60%. Examination (60%): 3 hour examination paper.
Prerequisites:	NSCC (Biology C or better)

Module Content:
It will consider organization of life, chemical basis of life, carbohydrates, proteins, nucleic acids, lipids and fats, water, cell structure and function, prokaryotic and eukaryotic cells, ultra-structure of plant and animal cells, cytoskeleton, membrane structure and function, cell communication, mitosis, meiosis, cell reproduction, cell cycle, and cell death. The following topics will be covered: Introduction to systems of classification, taxonomy and binomial nomenclature, including the five kingdoms and the three domein system. Definitions and categories/groups within the five kingdoms, evolution by natural selection (microevolution vs macroevolution), phylogeny and evolutionary relationships in five kingdoms. The course content will also include genes, chromosomes, genomes, Mendelian genetics, extensions to Mendelian genetics, chromosome theory of inheritance, linkage and cross-over, recombination, sex determination. The course content will also cover an introduction to Ecology: Definitions, history, scales in ecology, application of ecology. Conditions and Resources: Environmental conditions, animals and their resources, plants and their resources.

SPHY 3501: PHYSICS FOR LIFE SCIENCES I

Module title:	PHYSICS FOR LIFE SCIENCES I
Code:	SPHY3501
NQF level:	4
NPSC:	N/A
Contact hours:	28 Lectures and 14 Practical Sessions/Tutorials
Credits:	8
Module assessment:	Continuous Assessment (50%) and 1 x 3-hour Exam Paper (50%). Continuous Assessment will consist of class tests, tutorial tests/assignments and practical reports.
Pre-requisites:	None

Module Content:
This module is to introduce Life science students to physics concepts and applications that will be useful to them in their undergraduate studies and carrier.
The course will cover the following topics:
Units and significant figures; Motion in one dimension, average velocity, acceleration, freely falling bodies; Vectors and scalars, addition and subtraction of vectors in one and two dimensions, multiplication of vectors, component method of vector addition; Projectiles; Force and weight, Newton's laws and applications, free-body diagrams, friction, motion on inclined planes; Uniform circular motion, period and frequency of motion, centripetal force, banking of curves; Newton's law of Universal gravitation, gravity near the Earth's surface, satellites; Kepler's laws; Work done by a constant force, kinetic energy, work-energy theorem, potential energy, conservation of Mechanical energy, power; Momentum, impulse, conservation of energy and momentum in collisions, elastic and inelastic collisions in one dimension.

SMAT 3511: BASIC MATHEMATICS

Module name:	BASIC MATHEMATICS
Code:	SMAT 3511

NQF level:	5
Contact hours:	4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits:	16
Module Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite:	NSSC Mathematics

Module Content:
Sets: notations and diagrams to represent sets, subset, empty set, equality of sets, intersection, union, complement. Algebraic expressions: simplification, expansion, polynomials, reminder and factor theorem, partial fractions. Trigonometry: trigonometric functions, basic trigonometric identities. The absolute value, linear equations, linear inequalities, quadratic equations, the quadratic formula, quadratic inequalities. Functions: domain, codomain, image, preimage, even function, odd function. Sequences: the general term, the geometric sequence, the arithmetic sequence. The Binomial Theorem.

LEA3519 ENGLISH FOR ACADEMIC PURPOSES

Module title:	ENGLISH FOR ACADEMIC PURPOSES
Code:	LEA3519
NQF level:	5
Contact hours:	4 periods per week for 14 weeks
Credits:	16
Module assessment:	Continuous assessment (60%): 2 tests (reading and writing), 1 academic written essay,1 oral presentation Examination (40%) : One three hour examination paper
Prerequisites:	None

Module Content:
This module develops a student's understanding, and competencies regarding academic conventions such as academic reading, writing, listening and oral presentation skills for academic purposes. Students are required to produce a referenced and researched essay written in formal academic style within the context of their university studies. Students are also required to do oral presentations based on their essays. The reading component of the course deals with academic level texts. This involves students in a detailed critical analysis of such texts. The main aim is therefore, to develop academic literacy in English.

SCHM 3532: CHEMISTRY FOR LIFE SCIENCES

Module Title:	CHEMISTRY FOR LIFE SCIENCES
Code:	SCHM3532
NQF Level:	5
Contact Hours:	56 hours of lectures, 42 hours of practical sessions.
Credits:	16
Module Assessment:	CA: 50% (minimum 3 tests 80%, laboratory component 20%, tutorial assignments 10%). Final Exam: 50%; (1 x 3 hour exam paper)
Pre-requisites:	None

Module Content:
Classification of Matter: Mixtures and Pure substances; Physical States of Matter; Physical and Chemical Properties. Extensive and Intensive properties.
Measurements: Units, Significant figures; Precision and Accuracy, Factor Label Method. Atomic structure and the Periodic table; Electron configuration; Physical and Chemical properties as predicted from groups. Ionic compounds and Molecular compounds: Writing chemical formulae and naming of ionic and molecular compounds. Average Atomic Mass. The Mole Concept; Percent Composition, Empirical formula and Molecular formula. Stoichiometry: limiting reagent, percent yield. Solutions: electrolytes and non-electrolytes, aqueous solutions, ionic equations; concentrations: percent concentration; molarity, molality; dilution of solutions; structure and solubility. Types of bonds; Lewis structures; Resonance structures; Molecular geometry: the VSEPR model, Polarity of molecules. Acid-base equilibrium: properties of acids and bases; relations of acids and bases, self ionisation of water; strengths of acids and bases; the pH scale; hydrolysis of salts; buffers; acid-base titration. Introduction to organic chemistry: organic compounds; structural formulae and conformations; functional groups; Classes of hydrocarbons: alkanes, cycloalkanes: alkanes; alkenes and alkynes; oxidation and reduction; addition reactions; stereo-isomerism. Alcohols, phenols, thiols, ethers: organic compounds of oxygen; common alcohols and phenols. Carboxylic acids and esters, amines and amides: Introduction to carbohydrates, lipids and porphyrins.

SPHY 3532: PHYSICS FOR LIFE SCIENCES II

Module Title:	PHYSICS FOR LIFE SCIENCES II
Code:	SPHY 3532
NQF Level:	4

Contact Hours:	4 Lectures per week for 14 weeks, Practical Time: 14 sessions (42 hours)
Credits:	16
Module assessment:	Continuous assessment (50%, Minimum 2 tests, 4 assignments and practical reports) and Examination (50%,1 x 3-hour paper)
Pre-requisites:	NSSC Physical Science
Co-Requisites:	SPHY 3401: Physics for Life Sciences I; SMAT3511: Basic Mathematics; SMAT3512: Pre-calculus;

Module Content:

This module introduces life science students to concepts of physics and their application to real life situations, new topics that were not dealt with in PHY 3101 are introduced (i.e., on electricity, magnetism and radioactivity). The content of this course is good enough to help the life science students throughout their undergraduate work and careers. The following topics will also be covered: Electric charge; insulators and conductors; Electric force and coulomb's law , Electric field and Gauss's law; Electric potential; Capacitance and capacitors; Direct current; Ohm's law and simple circuits; Magnetic field; Alternating current; Transformers; Phenomenological approach to RL and RC circuits; Temperature, gas and thermal expansion; Basic geometrical optics; Radioactivity and its detection.

SBLG 3512: DIVERSITY OF LIFE

Module title:	DIVERSITY OF LIFE
Code:	SBLG 3512
Course Equivalent:	NSSC (/HIGH GRADE) Biology
NQF level:	5
Contact hours:	4 lecture periods / week for 14 weeks and one three hour practical session per week
Credits:	16
Module assessment:	Continuous assessment: Theory (not less than 3 tests and 2 Assignments) 40% Practicals (not less that 10 marked assignments) 50% Examination: 60% (1 x 2 hour examination paper)
Prerequisites:	NSCC (Biology C or better)

Module Content:

This module is designed to give students a detailed understanding of the diversity of life. It gives students the broader appreciation of biodiversity in the different ecological habitats. The course shall describe diagnostic characteristics of principle taxonomic categories for each phylum. Coverage of each Phylum shall follow a phylogenetic (evolutionary) approach as well as introduce broad ecological and physiological principles. Various aspects of reproduction and development shall be highlighted. This module prepares students to understand subsequent courses such as Introduction to Ecology and Microbiology, Population Ecology, Comparative physiology, Biogeography, Plant and Animal Form and Function

Topics covered will include viral, bacterial, fungal, algal, animal and plant diversity. It then considers the characteristics and life cycles of the following important algae, animal and plant groups: Chlorophyta, Phaeophyta, Rhodophyta, Chrysophyta, Euglenophyta, Pyrrophyta, Cryptophyta, Protostomate phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostomate phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chodrichthyes, Actinopterygii, Actinistia, Dipnoi, Amphibia, Reptilia, Aves, Mammalia) bryophytes, seedless vascular plants, gymnosperms, and the angiosperms. Concepts such as Homology and analogy; body symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered.

Examples from Namibia shall be used where possible and applicable. The course content shall be supplemented with appropriate weekly practical sessions in the laboratory and in the field.

SMAT 3512: PRE-CALCULUS

Module name:	PRE-CALCULUS
Code:	SMAT 3512
NQF level:	5
Contact hours:	4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits:	16
Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite:	NSSC Mathematics

Module Content:

Functions: one-to-one and onto functions, horizontal line test, composition of functions, inverse of a function. Introduction to exponential and logarithmic functions. Limit of a function: definition, left and right limits, infinite limits, limits at infinity, continuity in terms of limits. Differentiation: rate of change, derivative of a function, rules of differentiation, increasing and decreasing functions and graph sketching. Integration: antiderivatives, the definite integral, area under a graph. Trigonometry: further trigonometric identities, area of a sector and segment of a circle, derivatives and integrals of trigonometric functions.

(Although the above information has been compiled as accurately as possible, the Faculty of Agriculture and Natural Resources cannot be held responsible for any errors and/or omissions which may occur in the above module descriptors of modules offered by other Departments.)

H.2.2 SECOND YEAR MODULES

Module Title: POST HARVEST TECHNOLOGY	
Code	AFST3691
NQF Level	6
NQF Credits	12
Contact hours	Three Lecture hours / week for 14 weeks; 03Practical hours / week for alternating weeks. Duration of 14 weeks.
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course includes issues such as postharvest losses; physiological and biochemical characteristics of agricultural products with respect to maturation, ripening and storage life; respiration and is factors affecting respiration rates in selected agricultural crops; controlled atmosphere storage (CAS) and modified atmosphere packaging (MAP); postharvest treatments; postharvest handling, drying and storage of selected crops; pest control and fumigation, and other factors influencing quality. This course develops the students understanding of the ethics and practices employed in food processing. In addition, students are given an understanding of food preservation techniques and factors that affect food quality and shelf life.

Assessment strategies:
Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Exam: 60% (1 x 3 hr paper).

Module Title: GENERAL MICROBIOLOGY	
Code	AFST 3681
NQF Level	*6*
NQF Credits	*12*
Contact hours	Three Lecture hours / week for 14 weeks; 03 Practical hours / week for alternating weeks. Duration of 14 weeks.
Prerequisite	
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content
This course provides students with a general overview of microbiology, their environment, classifications, their morphology, structures and chemical composition. The biology of bacteria, fungi, algae, protozoa and viruses. Effect of antibiotics on microorganisms, important pathogens of plants and animals. The role of microorganisms in nature; in biogeochemical cycles, in general industries, food industries and in the soils. Concept of microbiology with special reference to microscopy, staining procedure, sterilization, aseptic, pure culture techniques and media preparation.

Assessment Strategies
Continuous Assessment 40% (minimum 2 tests, 2 assignments and 4 practicals). Examination: 60% (1 x 2hr paper)

Module Title: HUMAN NUTRITION	
Code	AFST 3601
NQF Level	*6*
Contact hours	Two Lecture hours / week for 14 weeks; 03 Practical hours / week for alternating weeks. Duration of 14 weeks.
NQF Credits	*8*
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This course gives students an overview of the locally available foods in Namibia and SADC region, basic nutritional aspects, food digestion system and fluctuations of nutrients in the body. Topics include Students anthropometric measurements: Body Mass Index (BMI), Basal Metabolic Rate (BMR) and Physical Activity Level (PAL); nutritional disorders resulting from deficiencies and excesses e.g. Blindness, Marasmus, Kwashiorkor and Obesity and other macronutrient deficiencies such as Rickets and Anaemia. Balanced ration for each group of people. Students will

acquire knowledge in the areas of preservation of nutrients, processing, packaging, GMPs & HACCP, food laws, food toxicology, intolerances and allergies. The role of nutrition with respect to HIV/AIDS will be covered.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5x marked practicals). Exam: 60% (1 x2hr paper)

Module Title: FRUITS AND VEGETABLES TECHNOLOGY	
Code:	AFST 3682
NQF Level	6
NQF Credits	*12*
Contact hours	Three hours of lectures per week, 03 hrs practicals every two week. Duration of 14 weeks.
PrerequisiteNONE	
Compulsory/ElectiveCompulsory	
Semester Offered	2

Module Content:
Students acquaint themselves with types of fruits and vegetables, their definitions, differences, uses, nutrition and economic importance including structure, composition and maturation of fruits and vegetables. They also analyse quality, handling procedures in order to extend shelf life of fresh produces and processed products. Students also learn processing and preservation of juices, concentrates, carbonated beverages, fermentation of wines, ciders, pickles, sauerkraut and drying, freezing, canning techniques. They evaluate quality and shelf life of processed fruits and vegetable products including packaging and labeling. They learn how to apply good manufacturing practices (GMPs) and Hazard analysis critical control points (HACCP).

Assessment strategies:
Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper)

Module Title: FOOD TECHNOLOGY	
Code	AFST 3602
NQF Level	6
NQF Credits	*8*
Contact hours	Two hours of lectures per week, three hours practicals every two week. Duration of 14 weeks.
Prerequisite None	
Compulsory/Elective Compulsory	
Semester Offered	2

Module Content
This course will introduce students to food industry in Namibia and SADC region on principles of food handling; food processing and preservation; food packaging and labeling. Impact of food technology on traditional foods and diet; influence of food technology on the culture and civilization of food consumption in Namibia; implications of population growth on the advancement of food technology. Food laws and quality management systems.

Assessment strategies
Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Exam: 60% (1 x 2hr paper)

Module Title: FOOD BIOTECHNOLOGY	
Code	AFST 3692
NQF Level	*7*
NQF Credits	*12*
Contact hours	Three hours of lectures per week, 03 hours practicals every two week. Duration of 14 weeks.
Prerequisite	
Compulsory/Elective	Compulsory

Semester Offered 1

Module Content:
The course includes topics such as Food biotechnology, an overview; importance, advances, trends and implications. Genetic engineering techniques; restriction enzymes, DNA cloning-cell transformation and transfection, Enzyme engineering and immobilization techniques. Downstream processing, Fermentations. Scale up operations. Biosafety risk assessment and risk management.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 3 hour paper)

H.2.3 THIRD YEAR MODULES

Module Title: FIELD ATTACHMENT 1

Code	AACA3701
NQF level	7
NQF credits	8
Contact hours	None
Prerequisite	None
Compulsory/elective	Compulsory
Semester offered	1

Module Content:
The module is designed to expose students to practical experience of actual operations on food-industries research and quality assurance institution. It enables students to observe and participate in food processing, quality control and management of operations.

Assessment strategies:
Final assessment 100% (Attachment report and oral presentation).

Module Title: FOOD CHEMISTRY

Code	AFST 3781
NQF Level	7
NQF Credits	12
Contact hours	Three hours of lectures per week, three hours practicals every two week. Duration of 14 weeks.
Prerequisite	Biochemistry AASC 3612:
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course is intended to provide students with knowledge on water chemistry in food processing and technology. The chemistry of important carbohydrates in foods: monosaccharides, oligosaccharides, polysaccharides, related compounds and sensory properties. Amino acid and protein chemistry in foods: Sensory properties of amino acids and protein. Animal and plant proteins: Texturised proteins. Lipid chemistry as applied to foods: free fatty acids, fats, glycerides phospholipids, glycolipids, waxes and cutins. Emulsions, emulsifiers and Flavour reversion. The role of minerals in foods and food processing. Major minerals and trace elements in food processing. The fat-soluble vitamins and water-soluble vitamins in foods and food processing. Aroma compounds; Food tastes and off-flavours. Nature, function and utilization of enzymes in food industry. Food additives including flavour enhancers; colouring agents; sugars and sweeteners; antioxidants. Surface-active agents; Thickening agents; Humectants; Anti-caking agents; Bleaching agents; Clarifying agents; Propellants and protective gases. Food texture, texture profile and measurement.

Assessment strategies:
Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Exam: 60% (1 x 2hr paper)

Module Title: FOOD MICROBIOLOGY

Code	AFST 3791
NQF Level	7
NQF Credits	12
Contact hours	Three hours of lectures per week, 03 hours practicals every two week. Duration of 14 weeks s

Prerequisite	General Microbiology AFST 3681:
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course is intended to provide students with in depth knowledge on microorganisms of interest in food. The laboratory techniques used in the isolation, enumeration and identification of microorganisms in food. Kinetics of multiplication of microorganisms. Microbiological principles of food processing and preservation. Food poisoning and intoxication. Sampling and sampling plans. Indices of sanitation in food. Biochemical reactions of microorganisms in food.

Assessment strategies:
Continuous Assessment: 40% (minimum 2 tests, 1 assignment and 3 practicals). Exam: 60% (1 x 2 hr paper)

Module Title: PRODUCT DEVELOPMENT AND SENSORY EVALUATION

Code	AFST 3701
NQF Level	7
Notional Hours	80
NQF Credits	8
Contact hours	Two hours of lectures per week, three hours practicals every two week. Duration of 14 weeks.
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course includes key concepts such as the process of product development, legislation and labeling of food products. Marketing issues relating to the identification of product niche markets and product criteria, market research, evaluation and trends are also covered. Further, the application of problem diagnosis for product refinement is covered. With regard to sensory evaluation, topics covered include physiological and psychological foundations, senses, scales and ratings, time-intensity scaling. Also included are: application of sensory evaluation, types of panels, types of tests and their specific functions when conducting statistical analysis and during interpretation of data, and the application of a SACCP system.

Assessment strategies:
Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper)

Module Title: FOOD PROCESSING TECHNOLOGY

Code	AFST 3791
NQF Level	7
NQF Credits	12
Contact hours	Two hours of lectures per week, 03 hours practicals every two week. Duration of 14 weeks.
Prerequisite	AFST 3602 Food Technology
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course includes issues such as handling of raw materials, food preparation processes e.g. size reduction, extrusion , preservation techniques e.g. pasteurization, sterilization, refrigeration, dehydration.

Assessment Strategies:
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination60% (1 x 2 hour paper)

Module Title: MEAT SCIENCE AND TECHNOLOGY

Code	AFSC 3781
NQF Level	7
NQF Credits	12
Contact hours	Three hours of lectures per week, 03 hours practicals every two week. Duration of 14 weeks

Prerequisite	AFST 3602: Food Technology
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course is intended to provide students with knowledge on meat industry in Namibia and the SADC region. Structure and composition of meat. Meat proteins and their functionality. Handling of slaughter animals. Slaughtering techniques. Selected topics related to animal anatomy. Grading and pricing of carcasses. Slaughterhouse hygiene. Carcass composition and characteristics and meat quality. Wholesale and retail of meat cuts. Meat processing, equipment and handling: meat packaging, meatstorage, chilling of meat, freezing of meat, smoking of meat, curing of meat, luncheon meats, sausages, sausage casings, meat fermentation. Quality factors and shelf life of processed meat products.

Assessment strategies:
Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper)

Module Title: FOOD TOXICOLOGY	
Code	AFST 3702
NQF Level	*7*
NQF Credits	8
Contact hours	Two lecture hours / week for 14 weeks; 03 practical hours alternate weeks for 14 weeks.
Prerequisite	FST 3781 Food Chemistry
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This course includes issues such as types of toxicity, toxicity measurements, biochemical aspects of toxicity, natural toxic constituents of foods, food spoilage and food borne diseases, manifestations of toxic effects and their remedies, food plant sanitation and hygiene, food inspection and legislation in Namibia.

Assessment Strategies:
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)

Module Title: FOOD ANALYSIS AND INSTRUMENTATION	
Code	AFST 3722
NQF Level	*7*
NQF Credits	8
Contact hours	Two lecture hours / week for 14 weeks; 03 practical hours alternate weeks for 14 weeks.
Prerequisite	Food Chemistry AFST 3781
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This course builds on concepts and principles of providing students with skills and dispositions regarding food analysis and instrumentation. Key concepts covered in the module include the scope of food analysis, analytical methods and procedures, assessment and validation of analytical data. The course explores issues on the importance of precision, accuracy, sensitivity, specificity, standard deviation, co-efficient of variation, good laboratory practice and quality assurance, health and safety when conducting food analysis. The module exposes the student to concepts and theories of AOAC, conventional analytical methods; analytical techniques: titrimetry, gravimetry; separation techniques: chromatography, electrophoresis; introduction to analytical spectroscopy: atomic spectroscopy, molecular spectroscopy and radiochemical methods.

Assessment strategies:
Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper)

Module Title: PRINCIPLES OF FOOD ENGINEERING	
Code	AFSC 3782
NQF Level	*7*

NQF Credits Contact Hours Prerequisite	12 *Three hours lectures per week for 14 weeks; 03 hours practical alternate week for 14 weeks.*
Compulsory/Elective	None
Semester Offered	Compulsory 2

Module Content:
This course covers: dimensions and units, unit operation calculations, heat and mass balance, heat and mass transfer, heat exchangers, fluid dynamics, rheology, psychrometrics and refrigeration calculations.

Assessment Strategies:
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)

H.2.4 FOURTH YEAR MODULES

Module Title: RESEARCH PROJECT	
Code	AFST 3810
NQF Level	8
NQF Credits	16
Contact Hours	Equivalent to 1 hour per week for 14 weeks.
Prerequisite	ACSC 3792: Research Methods
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The course includes writing of research proposal in Food Science and Technology field, carrying out research under supervision of lecturer, analyzing data and report presentation and research project write-up.

Assessment Strategies:
Oral Presentations 20% (10% x 2 presentations) Project Write-up80%

Module Title: FIELD ATTACHMENT II	
Code	AACA 3801
NQF Level	8
NQF Credits	6
Contact hours	None
Prerequisite	AACA3701: Field Attachment I
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The module is designed to expose students to practical experience of actual operations in food industries and research institutions. It enables students to observe and participate in food processing, management of operations and quality control.

Assessment strategies:
Final assessment 100% (Attachment report, oral presentations, and confidential reports by field supervisors).

Module Title: QUALITY MANAGEMENT SYSTEMS	
Code	AFST 3841
NQF Level	8
NQF Credits	8
Contact hours	Two lectures per week for 14 weeks
Prerequisite	AFST 3602: Food Technology
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course is intended to provide students with knowledge on the basic principles of quality management; Good Manufacturing Practices (GMPs); Food Safety; Food Hygiene and Sanitation; Food laws and regulations; Codex Alimentarius; Hazard Analysis Critical Control Point (HACCP); ISO 9001:2000, ISO 22000, ISO/IEC 17025, ISO 14 001; World Organization for Animal Health (OIE) and World Organization for Plant Health. Cleaner productions and food risk

assessment and/or analysis.

Assessment Strategies:
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)

Module Title: DAIRY SCIENCE AND TECHNOLOGY	
Code	AFST 3881
NQF Level	8
NQF Credits	12
Contact hours	Three lectures per week for 14 weeks; 03 hours Practical every alternate week for 14 weeks.
Prerequisite	Food Processing Technology AFSC 3791; Food Microbiology AFST 3791:
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Students acquaint themselves with the knowledge of udder anatomy, milk synthesis, secretion, milk let down assisted by hormones (oxytocin and adrenalin), clean production, collection, transportation, preservation and quality assessment (chemical, physical and microbiological). They also learn how to process milk into various products, handling, packaging, storage, quality assurance and distribution of pasteurized milks (toned, recombined and reconstituted milks), cream, butter, fermented milk products, cheeses, ice cream, condensed/evaporated milk and milk powders. Marketing aspects of milk and dairy products are included.

Assessment strategies:
Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper).

Module Title: APPLIED FOOD ENGINEERING	
Code	AFST 3891
NQF Level	8
NQF Credits	12
Contact hours	Three lectures per week for 14 weeks; 03 hrPractical every alternate week for 14 weeks.
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course includes: Applied aspects of process and auxiliary equipment selection and operation of equipment for heating, cooling, pressure and vacuum development and fluid transport. Basic aspects of process control are also covered as well as advanced preservation technologies. Emerging Food Engineering technologies are discussed as well as their implication on future food processing. Aspects of computer modeling in food technology are covered.

Assessment Strategies:
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)

Module Title: FOOD PACKAGING, STORAGE AND DISTRIBUTION	
Code	AFST 3861
NQF Level	8
NQF Credits	8
Contact hours	Two lectures per week for 14 weeks; 03 hours Practical for 3 hours every alternate week for 14 weeks.
Prerequisite	AFST 3602 Food Technology; AFST 3791 Post Harvest Technology
Compulsory/Elective	Compulsory
Semester Offered	1

ModuleContent:
Students will acquaint themselves with essentials and importance of packaging, functions of packaging, types of packaging, methods of manufacturing packaging materials, their chemical and physical effects on food. They also learn the properties of packaging materials such as permeability to water, air and microbes including methods of prevention such as lamination and lacquering of packaging materials, shelf life and storage of packaging materials. They are also taught new packaging technologies to prevent food spoilage; aseptic packaging, free oxygen scavenging packaging, types of oxygen absorbers, gas-exchange packaging, vacuum packaging, alcohol generating agent, labeling and distribution of products.

Assessment strategies
Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practical). Examination: 60% (1 x 2hr paper).

Module Title: SEA FOODS TECHNOLOGY	
Code	AFST 3862
NQF Level	8
NQF Credits	8
Contact hours	Two lectures per week for 14 weeks; 03 hours Practical for every alternate week for 14 weeks.
Prerequisite	AFST 3602 Food technology
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This course covers the fishing industry in Namibia and the concepts and principles involved in Fish-catching technology. The course focuses on the composition and chemistry of seafood components. The course exposes the students to the concepts and theories involved in processing surimi from fatty fish, Fish protein hydrolysates/ concentrates, Fish-meal and Fish-oil. Seafood processing by-products will also be covered. The course focuses on the Quality of seafoods e.g. freshness quality of seafoods, the uses of sensory assessment of fish and Seafoods and preservation of seafood quality. The topics of microbiological quality of seafoods e.g. virus, bacteria and parasites and marine toxins will be covered. Students are further exposed to principles and applications of Quality control and management in seafood.

Assessment strategies:
Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper)

Module Title: CEREAL SCIENCE AND TECHNOLOGY	
Code	AFST 3882
NQF Level	8
NQF Credits	12
Contact hours	Three lectures per week for 14 weeks;03 hours Practical for every alternate week for 14 weeks.
Contact hours	
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This course focuses on the types of cereals, their differences, uses and economic importance. The Physico-chemical composition and nutritional value of cereals grains are explored. Key concepts of quality assessment of cereal grains, grain handling and storage are covered in this course. Students are exposed to principles and applications involved in milling of different cereals e.g. Dry milling of maize, wet milling of maize, milling of wheat and milling of rice. The issues of flour quality, starch and its uses will be covered. These concepts are applied to the rheology of wheat flour dough and processing and characterization of cereal products. The course exposes the student to concepts involved in Baking technology e.g. bread, cakes, and biscuits; Breakfast cereals e.g. cornflakes, weetabix, puff products; Pasta Products e.g. spaghetti, macaroni and noodles. Key concepts, theories and applications in Brewing technology e.g. malting, malt milling, yeast growth kinetics, fermenter design, wort preparation and fermentation to beer, beer ageing and Quality assurance and control will be covered.

Assessment strategies
Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2 hr paper).

Module Title:	EDIBLE FATS AND OILS TECHNOLOGY
Code	AFSC 3802
NQF Level	8
NQF Credits	8
Contact hours	Three lectures per week for 14 weeks;03 hours Practical for every alternate week for 14 weeks.
Prerequisite	AFST 3781: Food Chemistry
Compulsory/Elective	Compulsory

Semester Offered 2

Module Content:
The module includes a comprehensive Lipid chemistry review including the structure of common chemical reactions and simple physical properties. The module exposes the student to concepts and theories of seed decortications and simple decorticators, graters, pulverisers, heaters, roasters, expellers and presses. The issues relating to establishing a small scale and commercial extraction of fats and oils, Oil refinery, Oil storage and packaging will be covered. The module also focuses on the importance of Shelf life, Side reactions during processing and food preparation. The module introduces students to Oil products e.g. cooking oil, margarine, lard, butter and salad oils. Product utilization and quality control is explored in this module.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests,1 assignment and 4 marked practicals) Examination 60% (1 x 2 hour paper)

Module Title: PLANT EQUIPMENT AND MANAGEMENT

Code	FST 3822
NQF Level	8
NQF Credits	8
Contact hours	Two lecture hours per week for 14 weeks; 03hours Practical every alternate week for 14 weeks.
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The course includes: food processing plant layout, water/ waste water treatment, electrical power installation and safety, steam generation and utilization, Plant maintenance, plant records and accounts.

Assessment Strategies:
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)

I. B.SC. FISHERIES AND AQUATIC SCIENCES (HONS) [17BSFA]

All modules listed below, except English Communication and Study Skills, English for Academic Purposes and Contemporary Social Issues, will be offered by Faculty of Science. English Communication and Study Skills, English for Academic Purposes, Contemporary Social Issues and Computer Literacy are University Core Modules taken by all First Year University of Namibia students.

1.I PROGRAMME SCHEDULE

Course code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 1 Semester 1					
UCLC 3509	Computer Literacy	5	8	C	
ULCE 3419	English Communication and Study Skills	4	16	C	
UCSI 3580	Contemporary Social Issues	5	8	C	
SBLG 3511	Introduction to Biology	5	16	C	
SPHY 3501	Physics for Life Sciences I	5	8	C	
SMAT 3511	Basic Mathematics	5	16	C	
Total Credits Semester 1					72
Year 1 Semester 2					
ULEA 3519	English for Academic Purposes	5	16	C	
SCHM 3532	Chemistry for Life Sciences	5	16	C	
SBLG 3512	Diversity of Life	5	16	C	
SMAT 3512	Pre-calculus	5	16	C	
Total credits Semester 2					64
TOTAL CREDITS YEAR 1					136

Year 2 Semester 1					
AAEC 3681	Principles of Microeconomics	6	12	C	None
AAEC 3691	Rural Sociology	6	12	C	None
AASC 3681	Genetics	6	12	C	None
ACRS 3681	Biostatistics	7	12	C	SMAT 3511 Basic Mathematics
AFAS 3691	Aquatic Ecology	6	12	C	None
AFST 3681	General Microbiology	6	12	C	None
AFAS 3601	Ichthyology I	6	8	C	None
Total Credits Semester 1					80
Year 2 Semester 2					
AAEC 3682	Production Economics	6	12	C	None
AFAS 3682	Introduction to Aquaculture	6	12	C	None
AASC 3612	Biochemistry	6	16	C	None
AFAS 3692	Aquatic Chemistry	6	12	C	None
AFAN 3682	Natural Resource Economics	6	12	C	None
Total credits Semester 2					64
TOTAL CREDITS YEAR 2					144

Year 3 Semester 1					
AACA 3701	Field Attachment I	7	8	C	None
AFAP 3781	Physical Oceanography	6	12	C	None
AFAS 3781	Aquaculture and Fisheries products	7	12	C	None
AFAF 3781	Ichthyology II	7	12	C	AFAS 3682: Introduction to Aquaculture and AFAS 3602: Ichthyology I
AFAS 3791	Fisheries Management I	7	12	C	AFAS 3602: Ichthyology I and AFAN 3682: Natural Resource Economics

AAEC 3781	Farm Planning and Management	7	12	C	None
Total Credits Semester 1					68
Year 3 Semester 2					
AFAS 3782	Basic Aquaculture Engineering	7	12	C	AFAS 3682: Intro to Aquaculture, AFAS 3692: Aquatic Chemistry, AFAS 3691: Aquatic Ecology and AFAS 3602: Ichthyology I
AFAS 3792	Fisheries Management II	7	12	C	AFAS 3602: Ichthyology I and AFAN 3682: Natural Resource Economics
AFAS 3712	Integrated Coastal Zone Management	7	16	C	AFAS 3691: Aquatic Ecology
AFAA 3782	Aquaculture Nutrition and Feed Manufacturing	7	12	C	None
ACSC 3792	Research Methods	7	12	C	ACRS 3681: Biostatitsics
Total credits Semester 2					64
TOTAL CREDITS YEAR 3					132

Year 4 Semester 1					
AFAS 3810	Research Project	8	16	C	ACSC 3792: Research Methods
AFAS 3811	Biological Oceanography	8	16	C	AFAS 3781 Physical Oceanography, and FAS 3692 Aquatic Chemistry
AACA 3801	Field Attachment II	8	8	C	None
AFAS 3831	Fish Pathology	8	16	C	AFST 3681 General Microbiology and AFAS 3682: Introduction to Aquaculture
AFAS 3891	Fisheries Economics	8	12	C	AFAN 3682: Natural Resource Economics, AFAF 3781: Fisheries Management I and AFAF: 3782 Fisheries Management II
Total Credits Semester 1					68
Year 4 Semester 2					
AFAS 3810	Research Project	8	16	C	ACSC 3792: Research Methods
AENE 3882	Environmental Impact Assessment	8	12	C	AFAS 3712: Integrated Coastal Zone Management
AFAS 3812	Fish Population Dynamics	8	16	C	ACSC 3792: Research Methods
AFAS 3832	Aquaculture Management	8	16	C	AFAS: 3682: Introduction to Aquaculture, AFAS 3782 : Basic Aquaculture Engineering and AFAA 3782: Aquaculture Nutrition and Feed Manufacturing
Total credits Semester 2					60
TOTAL CREDITS YEAR 4					128
		TOTAL CREDITS FOR THE PROGRAMME			540

I.2 MODULE DESCRIPTORS

I.2.1 FIRST YEAR MODULES

CLC3509 COMPUTER LITERACY

Module title:	COMPUTER LITERACY
Code:	CLC3509
NQF level:	5
Contact hours:	1 lecture theory and 1 lecture practical per week for 14 weeks
Credits:	8
Module assessment:	Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%
Prerequisites:	University Entry

Module Content:

The module covers the following topics. Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system: File Management, working with multiple programs, using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge. Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the workbook. Databases: creating tables, relationships, queries, forms and reports. Presentation software: slide layout and master, animations, auto-content wizard and templates. Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

LCE3419 ENGLISH COMMUNICATION & STUDY SKILLS

Module title:	ENGLISH COMMUNICATION AND STUDY SKILLS
Code:	LCE3419
NQF Level:	4
Contact hours:	4 hours per week for 14 weeks
Credits:	16
Module Assessment:	Continuous assessment (60%): two tests (reading and writing), two reading assignments, one oral presentation Examination (40%): one three hour examination paper
Pre-requisites:	None

Module Content:

This module is aimed at assisting students in the development of their reading, writing and speaking and listening skills, in order to cope with studying in a new academic environment and in a language which may not be their first language. The module also focuses on study skills that students need throughout their academic careers and beyond. The module serves as an introduction to university level academics, where styles of teaching and learning differ from those at secondary schools in that more responsibility is placed on the student. The module therefore, focuses on the skills that students need throughout their academic careers and beyond.

CSI 3580 CONTEMPORARY SOCIAL ISSUES

Code	CSI 3580
NQF Level	5
Contact hours	Equivalent to 1 hour per week for two semesters (Online)
NQF Credits	8
Prerequisite	None (University Core Module)
Compulsory/Elective	Compulsory
Semester Offered	1 & 2 (Year Module)

Module Descriptor (Rationale of the module):

The module, Contemporary Social Issues (CSI3580), is designed to encourage behavioural change among UNAM students and inculcate the primacy of moral reasoning in their social relations and their academic lives. In providing students with critical and analytical thinking the module enables students to grow and develop into well rounded citizens, capable of solving contemporary social challenges experienced in their communities and societies. The teaching of the module takes three dimensions: the intellectual, the professional and the personal dimensions. The intellectual dimension is fostered through engaging students with subject knowledge, independent learning and module assessment. The professional dimension, on the other hand, is fostered through exposing students to real life situations of case studies and practical exercises that draws attention to

social issues that attract ongoing political, public and media attention and/or debate. Finally, the professional dimension is fostered through group work, online discussions and class participation.

SBLG 3511: INTRODUCTION TO BIOLOGY	
Module title:	INTRODUCTION TO BIOLOGY
Code:	SBLG 3511
Course Equivalent:	Biology 1A
NQF level:	4
Contact hours:	4 lectures/ week for 14 weeks and one 3-hour practical session per week.
Credits:	16
Module assessment:	Continuous assessment (40%): Theory (not less than 3 tests and 2 assignments), 40%. Practicals (not less than 10 marked assignment), 60%. Examination (60%): 3 hour examination paper.
Prerequisites:	NSCC (Biology C or better)

Module Content:

It will consider organization of life, chemical basis of life, carbohydrates, proteins, nucleic acids, lipids and fats, water, cell structure and function, prokaryotic and eukaryotic cells, ultra-structure of plant and animal cells, cytoskeleton, membrane structure and function, cell communication, mitosis, meiosis, cell reproduction, cell cycle, and cell death. The following topics will be covered: Introduction to systems of classification, taxonomy and binomial nomenclature, including the five kingdoms and the three domein system. Definitions and categories/groups within the five kingdoms, evolution by natural selection (microevolution vs macroevolution), phylogeny and evolutionary relationships in five kingdoms. The course content will also include genes, chromosomes, genomes, Mendelian genetics, extensions to Mendelian genetics, chromosome theory of inheritance, linkage and cross-over, recombination, sex determination. The course content will also cover an introduction to Ecology: Definitions, history, scales in ecology, application of ecology. Conditions and Resources: Environmental conditions, animals and their resources, plants and their resources.

SPHY 3501: PHYSICS FOR LIFE SCIENCES I	
Module title:	PHYSICS FOR LIFE SCIENCES I
Code:	SPHY3501
NQF level:	4
NPSC:	N/A
Contact hours:	28 Lectures and 14 Practical Sessions/Tutorials
Credits:	8
Module assessment:	Continuous Assessment (50%) and 1 x 3-hour Exam Paper (50%). Continuous Assessment will consist of class tests, tutorial tests/assignments and practical reports.
Pre-requisites:	None

Module Content:

This module is to introduce Life science students to physics concepts and applications that will be useful to them in their undergraduate studies and carrier.

The course will cover the following topics:

Units and significant figures; Motion in one dimension, average velocity, acceleration, freely falling bodies; Vectors and scalars, addition and subtraction of vectors in one and two dimensions, multiplication of vectors, component method of vector addition; Projectiles; Force and weight, Newton's laws and applications, free-body diagrams, friction, motion on inclined planes; Uniform circular motion, period and frequency of motion, centripetal force, banking of curves; Newton's law of Universal gravitation, gravity near the Earth's surface, satellites; Kepler's laws; Work done by a constant force, kinetic energy, work-energy theorem, potential energy, conservation of Mechanical energy, power; Momentum, impulse, conservation of energy and momentum in collisions, elastic and inelastic collisions in one dimension.

H.5.1.6	SMAT 3511: BASIC MATHEMATICS
Module name:	BASIC MATHEMATICS
Code:	SMAT 3511
NQF level:	5
Contact hours:	4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits:	16
Module Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite:	NSSC Mathematics

Module Content:

Sets: notations and diagrams to represent sets, subset, empty set, equality of sets, intersection, union, complement. Algebraic expressions: simplification, expansion, polynomials, reminder and factor theorem, partial fractions. Trigonometry: trigonometric functions, basic trigonometric identities. The absolute value, linear equations, linear inequalities, quadratic equations, the quadratic formula, quadratic inequalities. Functions: domain, codomain,

image, preimage, even function, odd function. Sequences: the general term, the geometric sequence, the arithmetic sequence. The Binomial Theorem.

H.5.1.7	LEA3519 ENGLISH FOR ACADEMIC PURPOSES
Module title:	ENGLISH FOR ACADEMIC PURPOSES
Code:	LEA3519
NQF level:	5
Contact hours:	4 periods per week for 14 weeks
Credits:	16
Module assessment:	Continuous assessment (60%): 2 tests (reading and writing), 1 academic written essay,1 oral presentation Examination (40%) : One three hour examination paper
Prerequisites:	None

Module Content:

This module develops a student's understanding, and competencies regarding academic conventions such as academic reading, writing, listening and oral presentation skills for academic purposes. Students are required to produce a referenced and researched essay written in formal academic style within the context of their university studies. Students are also required to do oral presentations based on their essays. The reading component of the course deals with academic level texts. This involves students in a detailed critical analysis of such texts. The main aim is therefore, to develop academic literacy in English.

SCHM 3532: CHEMISTRY FOR LIFE SCIENCES	
Module Title:	CHEMISTRY FOR LIFE SCIENCES
Code:	SCHM3532
NQF Level:	5
Contact Hours:	56 hours of lectures, 42 hours of practical sessions.
Credits:	16
Module Assessment:	CA: 50% (minimum 3 tests 80%, laboratory component 20%, tutorial assignments 10%). Final Exam: 50%; (1 x 3 hour exam paper)
Pre-requisites:	None

Module Content:

Classification of Matter: Mixtures and Pure substances; Physical States of Matter; Physical and Chemical Properties. Extensive and Intensive properties.

Measurements: Units, Significant figures; Precision and Accuracy, Factor Label Method. Atomic structure and the Periodic table; Electron configuration; Physical and Chemical properties as predicted from groups. Ionic compounds and Molecular compounds: Writing chemical formulae and naming of ionic and molecular compounds. Average Atomic Mass. The Mole Concept; Percent Composition, Empirical formula and Molecular formula. Stoichiometry: limiting reagent, percent yield. Solutions: electrolytes and non-electrolytes, aqueous solutions, ionic equations; concentrations: percent concentration; molarity, molality; dilution of solutions; structure and solubility. Types of bonds; Lewis structures; Resonance structures; Molecular geometry: the VSEPR model, Polarity of molecules. Acid-base equilibrium: properties of acids and bases; relations of acids and bases, self ionisation of water; strengths of acids and bases; the pH scale; hydrolysis of salts; buffers; acid-base titration. Introduction to organic chemistry: organic compounds; structural formulae and conformations; functional groups; Classes of hydrocarbons: alkanes, cycloalkanes: alkanes; alkenes and alkynes; oxidation and reduction; addition reactions; stereo-isomerism. Alcohols, phenols, thiols, ethers: organic compounds of oxygen; common alcohols and phenols. Carboxylic acids and esters, amines and amides: Introduction to carbohydrates, lipids and porphyrins.

SBLG 3512: DIVERSITY OF LIFE	
Module title:	DIVERSITY OF LIFE
Code:	SBLG 3512
Course Equivalent:	NSSC (/HIGH GRADE) Biology
NQF level:	5
Contact hours:	4 lecture periods / week for 14 weeks and one three hour practical session per week
Credits:	16
Module assessment:	Continuous assessment: Theory (not less than 3 tests and 2 Assignments) 40% Practicals (not less that 10 marked assignments) 50% Examination: 60% (1 x 2 hour examination paper)
Prerequisites:	NSCC (Biology C or better)

Module Content:

This module is designed to give students a detailed understanding of the diversity of life. It gives students the broader appreciation of biodiversity in the different ecological habitats. The course shall describe diagnostic characteristics of principle taxonomic categories for each phylum. Coverage of each Phylum shall follow a phylogenetic (evolutionary) approach as well as introduce broad ecological and physiological principles. Various aspects of reproduction and development shall be highlighted. This module prepares students to understand subsequent

courses such as Introduction to Ecology and Microbiology, Population Ecology, Comparative physiology, Biogeography, Plant and Animal Form and Function

Topics covered will include viral, bacterial, fungal, algal, animal and plant diversity. It then considers the characteristics and life cycles of the following important algae, animal and plant groups: Chlorophyta, Phaeophyta, Rhodophyta, Chrysophyta, Euglenophyta, Pyrrophyta, Cryptophyta, Protostomate phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostomate phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chodrichthyes, Actinopterygii, Actinistia, Dipnoi, Amphibia, Reptilia, Aves, Mammalia) bryophytes, seedless vascular plants, gymnosperms, and the angiosperms. Concepts such as Homology and analogy; body symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered.

Examples from Namibia shall be used where possible and applicable. The course content shall be supplemented with appropriate weekly practical sessions in the laboratory and in the field.

SMAT 3512: PRE-CALCULUS

Module name:	PRE-CALCULUS
Code:	SMAT 3512
NQF level:	5
Contact hours:	4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits:	16
Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite:	NSSC Mathematics

Module Content:

Functions: one-to-one and onto functions, horizontal line test, composition of functions, inverse of a function. Introduction to exponential and logarithmic functions. Limit of a function: definition, left and right limits, infinite limits, limits at infinity, continuity in terms of limits. Differentiation: rate of change, derivative of a function, rules of differentiation, increasing and decreasing functions and graph sketching. Integration: antiderivatives, the definite integral, area under a graph. Trigonometry: further trigonometric identities, area of a sector and segment of a circle, derivatives and integrals of trigonometric functions.

(Although the above information has been compiled as accurately as possible, the Faculty of Agriculture and Natural Resources cannot be held responsible for any errors and/or omissions which may occur in the above module descriptors of modules offered by other Departments.)

I.2.2 SECOND YEAR MODULES

Module title: PRINCIPLES OF MICROECONOMICS

Code:	AAEC 3681
NQF level:	6
Contact hours	Lectures: 3x 1hr L/wk for 14 weeks (42hrs)
NQF Credits:	12
Prerequisites:	None
Compulsory/Elective	Compulsory
Semester Offered:	1

Module Content:

The course includes issues such as: introduction to the concept of scarcity, consumer theory, choices under uncertainty, theory of production, cost and output, the theory of the firm under perfect competition, supply and demand analysis, market structures (competitive markets, monopolistic, monopoly and oligopoly), general equilibrium analysis and efficiency, externalities, and public goods.

Assessment Strategies

Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)

Module Title: RURAL SOCIOLOGY

Code	AAEC 3691
NQF level	6
Contact hours	Lectures: 3x 1hr L/wk for 14 weeks (42hrs)
NQF Credits	12
Prerequisites:	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

This module investigates the basic sociological concepts and their application to agricultural progress and rural development planning; the significance of rural sociology to agricultural extension and rural development; differences between rural and urban population; culture and culture change, social interaction and social structures; groups and organization, deviance, social class and stratification; Social institutions families; religions; rural/urban migration and environment; social change in global perspective.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)

Module Title: PRODUCTION ECONOMICS

Course Code	AAEC 3682
NQF Level	*6*
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs)
NQF Credits	*12*
Prerequisite	Co-requisite: AAEC 3681: Principles of Microeconomics
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The course includes issues such as: production functions, cost of production, optimum resource allocation, profit maximization, isoquants, product-product relationships, economies of size and scale, technical change, and decision making under risk and uncertainty.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hr paper)

Module Title: GENERAL MICROBIOLOGY

Course Code	AFST 3681
NQF Level	*6*
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	*12*
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course provides a student with a general overview of microbiology including their environment, classifications, their morphology, structures and chemical composition. The biology of bacteria, fungi, algae, protozoa and viruses. Effect of antibiotics on microorganisms, important pathogens of plants and animals. The role of microorganisms in general industries, food industries and in the soils. Concept of microbiology with special reference to microscopy, staining procedure, sterilization, aseptic, pure culture techniques and media preparation.

Assessment Strategies
Continuous Assessment 40% (minimum 2 tests, 2 assignments and 4 practicals). Examination: 60% (1 x 2 hr paper)

Module Title: GENETICS

Code	AASC 3681
NQF Level	*6*
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	*12*
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This module covers Extension of Mendelian analysis and ratio – incomplete dominance, co-dominance, multiple alleles, gene interactions, pleiotropy, epistasis, lethal genes; Chromosome (Physical structure, Packaging, Karyotype and Variations); The Cell Cycle; Mitosis and its genetic significance; Meiosis and its genetic significance; Sex determination; Sex linkage and general examples of sex-linked inheritance; The molecular structure of DNA – the

double helix model; DNA replication in prokaryotes and eukaryotes; Gene expression (Transcription and Translation); Regulation of gene expression – The *Lac* operon; Mutations (types, causes, detection and significance). The module also introduces students to basic molecular biology concepts. It examines molecular organization of the genomes (prokaryotes and eukaryotes) and molecular structure of genes; it introduces DNA based technology such as Polymerase Chain Reaction (PCR), DNA extraction, electrophoresis, sequencing, genetic engineering and animal cloning.

Assessment Strategies
Continuous Assessment: 40% (2 assignments, 2 tests and at least 5 marked practicals). Examination: 60% (1 x2 hr paper).

Module Title: BIOCHEMISTRY

Code	AASC 3612
NQF Level	*6*
Contact hours:	Lectures: 4x 1hr/wk for 14 weeks (56hrs); Practical's: 1 x 3hr/wk for 14 weeks (42hrs
NQF Credits	*16*
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Course Content:
Under this course the students will learn about: Physical biochemistry: Acids, bases, buffers, pH, ionic strength, molarity; water (structure and ionization). Structural biochemistry: Structure and function of macromolecules (carbohydrates, proteins and lipids), Vitamins, Coenzymes and Cofactors. Enzymology: Enzymes as organic catalysts; Enzyme nomenclature; Factors affecting activities of enzymes; Enzyme kinetics - The Michaelis-Menten equation; The Lineweaver-Burk plot; Enzyme inhibition; Allosterism. Bioenergetics and thermodynamics: Free Energy, Laws of Energy, Activation Energy, Transition States, Endergonic and exergonic reactions. Metabolism: Catabolism and Anabolism; Carbohydrate catabolism (Glycolysis, Alcohol and lactic acid. Metabolism, Tricarboxylic acid cycle or the TCA cycle; Electron transport chain and oxidative phosphorylation); Regulation of carbohydrate metabolism; Gluconeogenesis; Synthesis of the disaccharides (lactose and sucrose); Synthesis of polysaccharides (starch and glycogen); Lipid metabolism (β-oxidation, malonly CoA); Integration of carbohydrate and fat metabolism; Amino acids and protein metabolism; Urea cycle; The Cori cycle; Pentose phosphate pathway; Glyoxylate cycle in oily seeds. Spectrophotometry: Fundamental laws of spectrophotometry and absorbance.

Assessment Strategies
Continuous Assessment: 40% (minimum 2 assignments, 2 tests and at least 5 marked practicals). Examination: 60% (1 x3 hr paper)

Module Title: AQUATIC ECOLOGY

Code	AFAS 3691
NQF Level	6
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Course Content:
Abiotic parameters influencing productivity of aquatic systems. Diversity, structure and functioning of the various community structures: phytoplankton, zooplankton and benthos; direct and interact interactions between the biotic and abiotic components of the aquatic systems. Functional webs. Influence of competition. Predation and symbiosis and commensalisms on community structure. Reproduction tactics, growth, survival and fecundity of producers and consumers.

Assessment Strategies
Continuous Assessment: 40% (minimum 2 assignments, 2 tests and at least 5x marked practicals). Examination: 60% (1 x2 hr paper)

Module Title: INTRODUCTION TO AQUACULTURE

Code	AFAS 3682
NQF Level	6
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12

Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Course content
History of aquaculture. Types of aquaculture systems and global aquaculture production statistics. Culturable aquaculture species. Site selection for aquaculture practices. Impact of aquaculture systems on the environment and regulations governing aquaculture practices. Environmental factors affecting aquaculture productivity: water quality, soil types, aquatic macrophytes. Pond designs and stocking. Introduction to aquaculture nutrition and feed formulations. Aquaculture diseases and management. Broodstock management and larval rearing. Aquaculture development in Namibia.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, 1 marked assignment and 3 practicals); Examination: 60% (1 x 2 hr paper)

Module Title:	ICHTHYOLOGY I
Code	AFAS 3601
NQF Level	6
Contact hours	Lectures: 2 x 1hr/wk for 14 weeks (28hrs); Practical's: 1 x 2hr alternate for 14 weeks (14hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Introduction to fish biosystematics, phylogeny and classification. Fish evolution; major groups of extinct fish species. External anatomy and variations of fish body forms; morphometric indices, identification and description of major groups of living fish species; agnatha (myxinoidei and petromyzontoidei), chondrichthyes and osteichthyes. Fish skin, colouration and camouflage. Fish scale formation and identification. Use of scale and Otolith in fish aging. Fish migration. Namibia marine and freshwater fish diversity.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests and 3 marked assignments); Examination: 60% (1 x 2 hr paper)

Module Title:	AQUATIC CHEMISTRY
Course Code	AFAS 3692
NQF Level	6
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Introduction to water chemical structure. Chemical composition of water bodies. Chemical and physical parameters: pH, salinity, alkalinity and carbon dioxide; total alkalinity and hardness; acidity; dissolved gasses and interaction with atmosphere; decomposition of organic matter; Nutrients and nutrient cycles: phosphorus, nitrogen, sulphur, iron and manganese; silicon and other micro-nutrient constituents. Physical – chemical interactions in oceanic and estuarine environment; Marine system pollution scenario. Irradiance/UVR and heat flux. Instrumentation and methods of measurement of water quality parameters.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals);
Examination: 60% (1 x 2 hr paper).

Module Title:	BIOSTATISTICS
Code	ACRSC 3681
NQF Level	6
Contact hours	3 lecture hours / week for 14 weeks; 3 tutorial / practical hours alternate weeks for 14
NQF Credits	12
Prerequisite	SMAT 3511 Basic Mathematics

Compulsory/Elective	Compulsory
Semester Offered	2

Module Content
Definition of statistics, descriptive and inferential statistics. Qualitative and quantitative data, primary versus secondary data. Sampling and sample size determinations, and replications. Presentation of data: tables, charts, graphs. Measures of central tendency: mean, mode, median. Measures of dispersion: standard deviation, coefficient of variation, standard error. Probability, Bayes' theorem, combinations and permutations, Binomial, Poisson, and Normal distributions, T-test and F- distribution mean comparisons, Analysis of variance, analysis assumptions. Single and multiple factor experiments, correlation and linear regression, transformations. Research process: research problem formulation, research objectives, hypothesis formulation. Basic experimental designs: completely randomized, randomized complete block, Latin square, Split plot.

Assessment Strategies
Continuous assessment (40%): at least three assessments; Examination (60%): 1 x 2 hr paper

Module Title:	NATURAL RESOURCE ECONOMICS
Code	AFAN 3682
NQF Level	6
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content
Natural resource economics: Renewable and non-renewable resources; natural- and man-made capital: Conservation and development. Sustainability: Resource scarcity and population growth; ecocentric vs. anthropocentric approach; Resource use; the precautionary use of user-pay principle; Economic growth and sustainable development. Brundtland report. Market failures: public goods, externalities. Valuing natural resources: surrogate market techniques, travel time, contingency valuation methods, non-use values; opportunity costs.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests and 3 marked assignments); Examination: 60% (1 x 2 hr paper)

I.2.3 THIRD YEAR MODULES

Module Title:	PHYSICAL OCEANOGRAPHY
Code	AFAP 3781
NQF Level	7
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Physical properties of sea water; What drives oceans? Global temperature and salinity distribution. Coastal processes: accumulation, fresh water runoff, sediment transport. Tides and tidal mechanisms. Eddy diffusion and turbulence. Waves and Tsunamis. Coriolis and Ekman transport. Statics (sea at rest) and Dynamics (wind driven and geostrophical currents, vertical water movement, rings and meanders). The Benguela Current system. Environmental conditions and the Fisheries. Physical and oceanographic instrumentation.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, 1 assignment and 3 practicals); Examination: 60% (1 x 2 hr paper)

Module Title:	Aquaculture and Fisheries Products
Code	AFAS 3781
NQF Level	7
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)

NQF Credits	12
Prerequisite	AFAS 3682: Introduction to Aquaculture
Compulsory/Elective	
Semester Offered	1

Course content
Aquaculture and Fisheries Products; Fish from farm/sea to the table; storage and slaughter techniques; Harvesting techniques; Processing technologies and preservation methods i.e. smoking, freezing, canning and drying; Transport and logistics; Packaging ; Nutritional composition; Product Development and value addition; Product Quality and Marketing; Food safety and health ; Quality evaluation; Quality Management Systems.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 practicals); Examination: 60% (1 x 2 hr paper)

Module Title:	ICHTHYOLOGY II
Code	AFAF 3781
NQF Level	7
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	AFAS 3682: Introduction to Aquaculture
Compulsory/Elective	
Semester Offered	1

Module Content:
Introduction to fish biology and internal anatomy. Respiration: structure and function of gills, mechanism of gaseous exchange, adaptation for air breathing in lungfishes. Digestive: structure and functions of alimentary canal, food and feeding habits. Excretion: structure and functions of excretory organs, osmoregulation and thermoregulation. Skeleton, muscle and swimming mechanism. Reproduction: structure and functions of gonads, gamete formation and reproductive strategies. Fish endocrinology and hormonal control. Introduction to fish genetics.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper)

Module Title: FIELD ATTACHMENT I

Code	ACA 3701
NQF Level	*7*
Contact hours	Six weeks of Field Attachment
NQF Credits	*8*
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content:
At the end of the Second year, students will be attached to selected institutions for hands-on-experience in selected area of subject specialization. Academic staff will pay field visits to students to discuss with them and their supervising officers on site the knowledge obtained and areas of exposure needing improvement.

Assessment Strategies
40 % report presentation at a seminar; 60 % Field report. Subject to satisfactory attendance and good conduct during attachment.

Module Title: FARM PLANNING AND MANAGEMENT

Code	AAEC 3781
NQF Level	*7*
NQF Credits	*12*
Contact Hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
Prerequisite	AAEC 3682: Production Economics
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The course includes issues such as: management of farm records; machinery; land; labor; and capital, farm business planning, enterprise budgeting, agricultural risk management strategies. Students will be exposed to business planning using spreadsheets.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper)

Module Title: FISHERIES MANAGEMENT I	
Code	AFAS 3791
NQF Level	7
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	FAS 3602: Ichthyology I, FAN 3682: Natural Resource Economics
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Introduction to theories of organization, history of fisheries management, management and decision making, fisheries management authorities (state owned, participatory/community based or co-management); fisheries management plans (design and implementation), fisheries regulations (input, output and technical regulations) enforcement of fisheries legislation (monitoring, control and surveillances; other participatory methods); management costs; characteristics of subsistence artisanal vs. industrial and commercial fisheries; livelihood approaches to fisheries, lesson learned from other countries including (SADC)

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper)

Module Title: FISHERIES MANAGEMENT II	
Code	AFAS 3792
NQF Level	7
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	AFAS 3602: Ichthyology I, AFAN 3682: Natural Resource Economics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Fisheries development and sustainability, fisheries and Marine Protected Areas (MPA), combating illegal, unreported and unregulated fishing (IUU), sustainable fisheries management approaches: ecosystem approach to fisheries, robust management, adaptive management, precautionary approach to fisheries; fish and seafood marketing and trade;. regional fisheries management, law of the sea.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper)

Module Title: INTEGRATED COASTAL ZONE MANAGEMENT	
Code	AFAS 3712
NQF Level	7
Contact hours	Lectures: 4x 1hr/wk for 14 weeks (56hrs); Practical's: 1 x 3hr for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	AFAS 3691: Aquatic Ecology
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Potential impacts by climate change and direct human interference on coastal systems. Impact assessment: scooping of habitats, focusing and validation of communities and species, identification and evaluation of impacts. Monitoring. ICZM strategies: coordinated retreat, adaptation (sustainability), protection. Ecological and sociological implications. Internal functioning of companies; company decision making and the influence of externally set conditions with emphasis on Namibian based companies.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper).

Module Title:	BASIC AQUACULTURE ENGINEERING
Code	AFAS 3782
NQF Level	7
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	AFAS 3682: Introduction to Aquaculture, AFAS 3692: Aquatic Chemistry, AFAS 3691: Aquatic Ecology, AFAS 3602: Ichthyology I
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content
Principles of site selection. Water transport: pipes and pipe parts, types of pumps. Water quality and water treatment. Heating and Cooling. Aeration and oxygenation. Aquaculture recirculating systems. Pond, cage tanks and raceway systems, their construction principles and layout. Fish transportation and size grading systems. Instrumentation and automation in aquaculture.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper).

Module Title:	RESEARCH METHODS
Course Code	ACSC 3792
NQF Level	7
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	ACSC 3692: Biostatistics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Students will be exposed to more advanced statistical concepts and research methods above those covered in Biostatistics. Comparison between parametric and non-parametric statistics. Non-parametric statistics: goodness of fit tests; tests of association, Chi Square tests; paired comparisons, Wilcoxon's tests; rank correlation; Multivariate methods: multiple regression, discriminant analysis, canonical analysis, multidimensional scaling, principal component analysis. Review of experimental designs with emphasis to livestock, crop and game animal experimentation. Review of procedures for implementing research projects and presentation of research results with emphasis to practical field situations and case studies. Introduction to Statistical Computer packages

Assessment Strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (1 x 2 hr paper)

Module Title:	AQUACULTURE NUTRITION AND FEED MANUFACTURING
Code	AFAA 3782
NQF Level	7
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Advantages/disadvantages of natural versus artificial diets; Basic components of artificial diets; Macro- and Micro Nutrients; proteins, carbohydrates, lipid/fats, energy and mineral/vitamins, amino acids, fatty acids, carotenoids; Use of biotechnology in feed enhancement; Nutritional requirements of fish at different life stages and different species. Nutrient digestion and pathways; Sources of feed stuffs/nutrients and binders; Feed formulation models; Least Cost production; Feed manufacturing techniques; Feed stability in water; Assessment of feed performance and fish growth performance.

Assessment Strategies

Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper).

I.2.4 FOURTH YEAR MODULES

Module Title:	RESEARCH PROJECT
Code	AFAS 3810
NQF Level	8
Contact hours	Consultation: 1 x 1hr/wk for 28 weeks (28 hrs)
NQF Credits	32
Prerequisite	ACSC 3792: Research Methods
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content:
Students carry out independent study of a current topic in natural resources and agriculture. The course include participation in meetings organized by the coordinator, work with a faculty advisor to develop a research project, formulate hypotheses, design and carry out preliminary experiments and collect data and test the hypotheses. Students will carry out independent library research, begin experimental work, prepare a written report and make a presentation to other students the proposal and final report. The student will submit a final report written following Guidelines for Scientific Writing.

Assessment Strategies
Continuous assessment (100%) consisting of research proposal write up and presentation of proposal in a seminar, presentation of empirical findings in a second seminar, and grading of the final report.

Module Title:	FIELD ATTACHMENT II
Code	AACA 3801
NQF Level	8
Contact hours	Six weeks of Field Attachment
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This module is designed to further expose students to the realities of the fishing industry operations in Namibia and beyond. They are expected to observe and participate in different facets of production, processing, marketing, extension and assist with management functions e.g. supervision of general work force and problem solving. Academic staff will pay field visits to students to discuss with them and their supervising officers on site the knowledge obtained and areas of exposure needing improvement.

Assessment Strategies
An attachment report and an oral presentation constitute the total assessment mark: 40% (Field Attachment Seminar Presentations). 60% (Field attachment Reports)

Module Title:	FISHERIES ECONOMICS
Code	AFAS 3891
NQF Level	8
Contact hours:	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr/wk alternate for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	AFAN 3682: Natural Resource Economics, AFAF 3781: Fisheries Management I, AFAF 3792: Fisheries Management II
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Role of economics in fisheries management. Production technology and efficiency. Catch and cost structure. Producer's surplus and resource rent. Profitability and efficiency parameters. Marketing functions and consumption. Maximum sustainable yield (MSY) versus maximum economic yield (MEY) Welfare economics.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper).

Module Title:	FISH PATHOLOGY
Code	FAS 3831
NQF Level	8
Contact hours	Lectures: 4 x 1hr/wk for 14 weeks (56rs); Practical's: 1 x 3hr/wk for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	SFST 3681: General Microbiology, AFAS 3682: Introduction to Aquaculture
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
General basic pathology and fish immune/defense system. General and basic parasitology, parasite specificity and parasite development cycle. Infectious diseases: viral, bacterial and fungal diseases. Invasive diseases: protozoan infection, mixosporidian infection, crustacean parasites, platyhelminthes infection of fish. Non- infectious diseases. Diseases of unknown etiology. Basic histopathology. Fish disease diagnosis, treatment and prophylaxis.. Biosecurity and animal welfare.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 10 marked practicals); Examination: 60% (1 x 3 hr paper).

Module Title:	ENVIRONMENTAL IMPACT ASSESSMENT
Code	AENE 3882
NQF Level	8
Contact hours:	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	AFAS 3712: Integrated Coastal Zone Management
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Definitions: impact assessment, Environmental studies, Environmental Impacts of Human Activities on Natural Resources; impact on atmosphere, impact on water bodies, impact on wildlife, impact on forests; Environmental considerations in Physical planning. Impact identification, monitoring and mitigation; methods of identifying impacts, methods of monitoring environmental impacts, types of mitigation actions. Formal Environmental Impact Assessment: Origins and significance of formalized approach; historical context and rationale; major issues in formal EIA process; procedure of formal EIA process, common methodologies and examples o their application, Choosing an appropriate methodology. Policy and Framework in Namibia: monitoring and quality control, role of Departmental Affairs; EIA in Namibia.

Assessment strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper).

Module Title:	BIOLOGICAL OCEANOGRAPHY
Code	FAS 3811
NQF Level	8
Contact hours:	Lectures: 4x 1hr/wk for 14 weeks (56hrs); Practical's: 1 x 3hr/wk for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	AFAP 3781: Physical Oceanography, AFAS 3692: Aquatic Chemistry
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Abiotic factors: Properties of sea water and sediment – sea water reactions. Dissolved nutrients, nutrient cycling and chemical – biological interactions. Biotic factors: Inhabitants of the pelagic biota (bacteria, algae, zooplankton, fish). Primary production, -regulation and regional aspects. Energy transfer and food chain processes. Pelagic – benthic interactions. Microbiology of oceans. Types of biotopes: polar, temperate and tropical systems. Marine system carrying capacity. Sampling gear and methods of species biomass assessment. Marine remote sensing. Oceanographic instrumentation and methods of measurement.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 10 marked practicals); Examination: 60% (1 x 3 hr paper).

Module Title:	FISH POPULATION DYNAMICS
Code	AFAS 3812
NQF Level	8
Contact hours:	Lectures: 4x 1hr/wk for 14 weeks (56hrs); Practical's: 1 x 3hr/wk for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	ACSC 3692: Biostatistics, ACSC 3792: Research Methods
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
An overview of fishing technology, design and choice of vessel and gear technology, fish aggregating- and selective devices, Impact of fishing gear on environment. Concepts in Fisheries science, estimation of age and growth parameters, estimation of mortality, gear selectivity, sampling, exponential decay model, stock recruitment relationship, non-age and age structured models, reference points, and projection model.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 10 marked practicals); Examination: 60% (1 x 3 hr paper).

Module Title:	AQUACULTURE MANAGEMENT
Code	AFAS 3832
NQF Level	8
Contact hours:	Lectures: 4x 1hr/wk for 14 weeks (56hrs); Practical's: 1 x 3hr/wk for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	AFAS 3682: Introduction to Aquaculture, AFAS 3792: Basic Aquaculture Engineering, AFAS 3781: Aquaculture Nutrition and Feed Manufacturing
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Broodstock, hatchery, water quality management. Live feed production. Selection breeding. Broodstock conditioning. Hygiene requirements on the farm. Bio-security. General Human Resources. Financial projections of aquaculture enterprises.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 10 marked practicals); Examination: 60% (1 x 3 hr paper).

J. B.SC. INTEGRATED ENVIRONMENTAL SCIENCE (HONS) (Ogongo Campus) [17BSIE]

All modules listed below, except English Communication and Study Skills, English for Academic Purposes and Contemporary Social Issues, will be offered by Faculty of Science. English Communication and Study Skills, English for Academic Purposes, Contemporary Social Issues and Computer Literacy are University Core Modules taken by all First Year University of Namibia students.

J.1 PROGRAMME SCHEDULE

Course Title	Course Code	NQF Level	Credits	Compulsory	Elective	Pre-requisite
Year 1						
Computer Literacy	UCLC 3509	5	8	Yes	No	
English Communication and Study Skills	ULCE 3419	4	16	Yes	No	
Contemporary Social Issues	UCSI 3580	5	16	Yes	No	
Introduction to Biology	SBLG 3511	4	16	Yes	No	
Basic Mathematics	SMAT 3511	5	16	Yes	No	
English for Academic Purposes	ULEA 3519	5	16	Yes	No	
Chemistry for Life Sciences	SCHM 3532	5	16	Yes	No	
Diversity of Life	SBLG 3512	5	16	Yes	No	
Pre-calculus	SMAT 3512	5	16	Yes	No	
Credits Year 1			136			

Year 2						
Principles of Microeconomics	AAEC 3681	6	12	Yes	No	
Rural Sociology	AAEC 3691	6	12	Yes	No	None
Genetics	AASC 3681	6	12	Yes	No	None
Ecology	AIES 3681	6	12	Yes	No	None
Environmental Science	AIES 3691	6	12	Yes	No	None
Biostatistics	ACRS3681	6	12	Yes	No	None
General Microbiology	AFST 3681	6	12	Yes	No	None
Principles of Macroeconomics	AAEC 3692	6	12	Yes	No	None
Biochemistry	AASC 3612	6	16	Yes	No	CHM 3532 (Chemistry for Life Sciences)
Soil Sciencefor Crop Production	ACRS 3682	6	12	Yes	No	None
Plant Physiology	AIES 3682	6	12	Yes	No	None
Natural Resource Economics	AFAN 3682	6	12	Yes	No	None
Climatology and Hydrology	AIES 3622	6	8	Yes	No	None
Credits Year 2			156			

Year 3						
Field Attachment I*	AACA 3701	7	8	Yes	No	None
Dryland Plants	AIED 3781	7	12	Yes	No	None
Principles of Wildlife Management	AIEP 3781	7	12	Yes	No	None
Geo-informatics	AIES 3791	7	12	Yes	No	None
Agroforestry	AIEA 3781	7	12	Yes	No	None
Nature Conservation	AIEN 3792	7	12	Yes	No	None
Natural Resource Governance	AIEN3782	7	12	Yes	No	None
Community Based Resource Mgt.	AIES 3702	7	8	Yes	No	None
Research Methods	ACSC 3792	7	12	Yes	No	CRS 3681 (Biostatistics)
Agricultural Extension	AAEC 3712	7	16	Yes	No	AAEC 3791(Rural Sociology)
Credits Year 3			126			None

Year 4						
Forestry Option						
Field Attachment II*	AACA 3801	8	8	Yes	No	ACA 3701 (Field Attachment I)
Research Project (Forestry)	AFOR 3810	8	32	Yes	No	ACSC 3792 (Research Methods)
Silviculture	AFOR 3881	8	12	Yes	No	AIES 3681(Ecology) and AIES 3682 (Plant Physiology)
Forest Protection	AFOR 3891	8	12	Yes	No	None
Forest Mensuration	AFOF 3881	8	12	Yes	No	None
Forest Inventory	FOR 3882	8	12	Yes	No	None
Forest Economics & Marketing	AFOR 3812	8	16	Yes	No	None
Forest Management	AFOR 3892	8	12	Yes	No	None
Project Planning and Management	AAEC 3881	8	12	Yes	No	None
Credits Year 4			126			
Total Credits			544			

Environmental Science Option						
Field Attachment II	AACA 3801	8	8	Yes	No	ACA 3701 (Field Attachment I)
Research Project (Environmental Science)	AENV 3810	8	32	Yes	No	ACSC 3792 (Research Methods)
Environment & Development	AENV 3881	8	12	Yes	No	None
Environmental Pollution Control	AENV 3891	8	12	Yes	No	None
Watershed Management	AENV 3801	8	8	Yes	No	None
Project Planning and Management	AAEC 3881	8	12	Yes	No	AAEC 3691 (Principles of Microeconomics)
Management of Arid and Semi-Arid Lands	AENV 3882	8	12	Yes	No	None
Environmental Planning and Management	AENP 3882	8	12	Yes	No	None
Environmental Impact Assessment	AENE 3882	8	12	Yes	No	AIES 3782 (Natural Resource Governance)
Environmental Education	AENE 3892	8	12	Yes	No	None
Credits Year 4			130			
Total Credits			548			

J.2 MODULE DESCRIPTORS

J.2.1 FIRST YEAR MODULES

CLC3509 COMPUTER LITERACY

Module title:	COMPUTER LITERACY
Code:	CLC3509
NQF level:	5
Contact hours:	1 lecture theory and 1 lecture practical per week for 14 weeks
Credits:	8
Module assessment:	Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%
Prerequisites:	University Entry

Module Content:
The module covers the following topics. Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system: File Management, working with multiple programs, using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge. Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the workbook. Databases: creating tables, relationships, queries, forms and reports. Presentation software: slide layout and master, animations, auto-content wizard and templates. Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

LCE3419 ENGLISH COMMUNICATION & STUDY SKILLS

Module title:	ENGLISH COMMUNICATION AND STUDY SKILLS
Code:	LCE3419
NQF Level:	4
Contact hours:	4 hours per week for 14 weeks
Credits:	16
Module Assessment:	Continuous assessment (60%): two tests (reading and writing), two reading assignments, one oral presentation Examination (40%): one three hour examination paper
Pre-requisites:	None

Module Content:
This module is aimed at assisting students in the development of their reading, writing and speaking and listening skills, in order to cope with studying in a new academic environment and in a language which may not be their first language. The module also focuses on study skills that students need throughout their academic careers and beyond. The module serves as an introduction to university level academics, where styles of teaching and learning differ from those at secondary schools in that more responsibility is placed on the student. The module therefore, focuses on the skills that students need throughout their academic careers and beyond.

CSI 3580 CONTEMPORARY SOCIAL ISSUES

Code	CSI 3580
NQF Level	5
Contact hours	Equivalent to 1 hour per week for two semesters (Online)
NQF Credits	8
Prerequisite	None (University Core Module)
Compulsory/Elective	Compulsory
Semester Offered	1 & 2 (Year Module)

Module Descriptor (Rationale of the module):

The module, Contemporary Social Issues (CSI3580), is designed to encourage behavioural change among UNAM students and inculcate the primacy of moral reasoning in their social relations and their academic lives. In providing students with critical and analytical thinking the module enables students to grow and develop into well rounded citizens, capable of solving contemporary social challenges experienced in their communities and societies. The teaching of the module takes three dimensions: the intellectual, the professional and the personal dimensions. The intellectual dimension is fostered through engaging students with subject knowledge, independent learning and module assessment. The professional dimension, on the other hand, is fostered through exposing students to real life situations of case studies and practical exercises that draws attention to social issues that attract ongoing political, public and media attention and/or debate. Finally, the professional dimension is fostered through group work, online discussions and class participation.

SBLG 3511: INTRODUCTION TO BIOLOGY

Module title:	INTRODUCTION TO BIOLOGY
Code:	SBLG 3511
Course Equivalent:	Biology 1A
NQF level:	4
Contact hours:	4 lectures/ week for 14 weeks and one 3-hour practical session per week.
Credits:	16
Module assessment:	Continuous assessment (40%): Theory (not less than 3 tests and 2 assignments), 40%. Practicals (not less than 10 marked assignment), 60%. Examination (60%): 3 hour examination paper.
Prerequisites:	NSCC (Biology C or better)

Module Content:
It will consider organization of life, chemical basis of life, carbohydrates, proteins, nucleic acids, lipids and fats, water, cell structure and function, prokaryotic and eukaryotic cells, ultra-structure of plant and animal cells, cytoskeleton, membrane structure and function, cell communication, mitosis, meiosis, cell reproduction, cell cycle, and cell death.

The following topics will be covered: Introduction to systems of classification, taxonomy and binomial nomenclature, including the five kingdoms and the three domein system. Definitions and categories/groups within the five kingdoms, evolution by natural selection (microevolution vs macroevolution), phylogeny and evolutionary relationships in five kingdoms. The course content will also include genes, chromosomes, genomes, Mendelian genetics, extensions to Mendelian genetics, chromosome theory of inheritance, linkage and cross-over, recombination, sex determination. The course content will also cover an introduction to Ecology: Definitions, history, scales in ecology, application of ecology. Conditions and Resources: Environmental conditions, animals and their resources, plants and their resources.

SMAT 3511: BASIC MATHEMATICS

Module name:	BASIC MATHEMATICS
Code:	SMAT 3511
NQF level:	5
Contact hours:	4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits:	16
Module Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite:	NSSC Mathematics

Module Content:

Sets: notations and diagrams to represent sets, subset, empty set, equality of sets, intersection, union, complement. Algebraic expressions: simplification, expansion, polynomials, reminder and factor theorem, partial fractions. Trigonometry: trigonometric functions, basic trigonometric identities. The absolute value, linear equations, linear inequalities, quadratic equations, the quadratic formula, quadratic inequalities. Functions: domain, codomain, image, preimage, even function, odd function. Sequences: the general term, the geometric sequence, the arithmetic sequence. The Binomial Theorem.

LEA3519 ENGLISH FOR ACADEMIC PURPOSES

Module title:	ENGLISH FOR ACADEMIC PURPOSES
Code:	LEA3519
NQF level:	5
Contact hours:	4 periods per week for 14 weeks
Credits:	16
Module assessment:	Continuous assessment (60%): 2 tests (reading and writing), 1 academic written essay,1 oral presentation Examination (40%) : One three hour examination paper
Prerequisites:	None

Module Content:

This module develops a student's understanding, and competencies regarding academic conventions such as academic reading, writing, listening and oral presentation skills for academic purposes. Students are required to produce a referenced and researched essay written in formal academic style within the context of their university studies. Students are also required to do oral presentations based on their essays. The reading component of the course deals with academic level texts. This involves students in a detailed critical analysis of such texts. The main aim is therefore, to develop academic literacy in English.

SCHM 3532: CHEMISTRY FOR LIFE SCIENCES

Module Title:	CHEMISTRY FOR LIFE SCIENCES
Code:	SCHM3532
NQF Level:	5
Contact Hours:	56 hours of lectures, 42 hours of practical sessions.
Credits:	16
Module Assessment:	CA: 50% (minimum 3 tests 80%, laboratory component 20%, tutorial assignments 10%). Final Exam: 50%; (1 x 3 hour exam paper)
Pre-requisites:	None

Module Aims:

This module is designed for students that have insufficient background in chemistry and for non-chemistry majors .It is an introduction to topics in general and organic chemistry, and biochemistry. The following will be covered:

Module Content:

Classification of Matter: Mixtures and Pure substances; Physical States of Matter; Physical and Chemical Properties. Extensive and Intensive properties.

Measurements: Units, Significant figures; Precision and Accuracy, Factor Label Method. Atomic structure and the Periodic table; Electron configuration; Physical and Chemical properties as predicted from groups. Ionic compounds and Molecular compounds: Writing chemical formulae and naming of ionic and molecular compounds. Average Atomic Mass. The Mole Concept; Percent Composition, Empirical formula and Molecular formula. Stoichiometry: limiting reagent, percent yield. Solutions: electrolytes and non-electrolytes, aqueous solutions, ionic equations; concentrations: percent concentration; molarity, molality; dilution of solutions; structure and solubility. Types of bonds; Lewis structures; Resonance structures; Molecular geometry: the VSEPR model, Polarity of molecules. Acid-base equilibrium: properties of acids and bases; relations of acids and bases, self ionisation of water; strengths of acids and bases; the pH scale; hydrolysis of salts; buffers; acid-base titration. Introduction to organic chemistry: organic compounds; structural formulae and conformations; functional groups; Classes of hydrocarbons: alkanes, cycloalkanes: alkanes; alkenes and alkynes; oxidation and reduction; addition reactions; stereo-isomerism. Alcohols, phenols, thiols, ethers: organic compounds of oxygen; common alcohols and phenols. Carboxylic acids and esters, amines and amides: Introduction to carbohydrates, lipids and porphyrins.

SBLG 3512: DIVERSITY OF LIFE

Module title:	DIVERSITY OF LIFE
Code:	SBLG 3512
Course Equivalent:	NSSC (/HIGH GRADE) Biology
NQF level:	5
Contact hours:	4 lecture periods / week for 14 weeks and one three hour practical session per week
Credits:	16
Module assessment:	Continuous assessment: Theory (not less than 3 tests and 2 Assignments) 40% Practicals (not less that 10 marked assignments) 50% Examination: 60% (1 x 2 hour examination paper)
Prerequisites:	NSCC (Biology C or better)

Module Content:

This module is designed to give students a detailed understanding of the diversity of life. It gives students the broader appreciation of biodiversity in the different ecological habitats. The course shall describe diagnostic characteristics of principle taxonomic categories for each phylum. Coverage of each Phylum shall follow a phylogenetic (evolutionary) approach as well as introduce broad ecological and physiological principles. Various aspects of reproduction and development shall be highlighted. This module prepares students to understand subsequent courses such as Introduction to Ecology and Microbiology, Population Ecology, Comparative physiology, Biogeography, Plant and Animal Form and Function

Topics covered will include viral, bacterial, fungal, algal, animal and plant diversity. It then considers the characteristics and life cycles of the following important algae, animal and plant groups: Chlorophyta, Phaeophyta, Rhodophyta, Chrysophyta, Euglenophyta, Pyrrophyta, Cryptophyta, Protostomate phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostomate phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chodrichthyes, Actinopterygii, Actinistia, Dipnoi, Amphibia, Reptilia, Aves, Mammalia) bryophytes, seedless vascular plants, gymnosperms, and the angiosperms. Concepts such as Homology and analogy; body symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered.

Examples from Namibia shall be used where possible and applicable. The course content shall be supplemented with appropriate weekly practical sessions in the laboratory and in the field.

SMAT 3512: PRE-CALCULUS

Module name:	PRE-CALCULUS
Code:	SMAT 3512
NQF level:	5
Contact hours:	4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits:	16
Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite:	NSSC Mathematics

Module Content:

Functions: one-to-one and onto functions, horizontal line test, composition of functions, inverse of a function. Introduction to exponential and logarithmic functions. Limit of a function: definition, left and right limits, infinite limits, limits at infinity, continuity in terms of limits. Differentiation: rate of change, derivative of a function, rules of differentiation, increasing and decreasing functions and graph sketching. Integration: antiderivatives, the definite integral, area under a graph. Trigonometry: further trigonometric identities, area of a sector and segment of a circle, derivatives and integrals of trigonometric functions.

(Although the above information has been compiled as accurately as possible, the Faculty of Agriculture and Natural Resources cannot be held responsible for any errors and/or omissions which may occur in the above module descriptors of modules offered by other Departments.)

J.2.2 SECOND YEAR MODULES

Module Title: PRINCIPLES OF MICROECONOMICS

Code:	AAEC 3681
NQF level:	6
Contact hours	Lectures: 3x 1hr L/wk for 14 weeks (42hrs)
NQF Credits:	12
Prerequisites:	None
Compulsory/Elective	Compulsory
Semester Offered:	1

Module Content:

The course includes issues such as: introduction to the concept of scarcity, consumer theory, choices under uncertainty, theory of production, cost and output, the theory of the firm under perfect competition, supply and demand analysis, market structures (competitive markets, monopolistic, monopoly and oligopoly), general equilibrium analysis and efficiency, externalities, and public goods.

Assessment Strategies

Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)

Module Title: PRINCIPLES OF MACROECONOMICS

Code:	AAEC 3682
NQF level:	6
Contact hours	Lectures: 3x 1hr L/wk for 14 weeks (42hrs)
NQF Credits:	12
Prerequisites:	None
Compulsory/Elective	Compulsory
Semester Offered:	2

Module Content:

The course includes issues such as: price indices, inflation, real and nominal values, national accounting, determination of aggregate demand and supply, consumption, investment, and savings; it also presents fiscal and monetary policies, government spending, taxation, budget deficits, interest rates, money and banking and balance of payments, employment and business cycles. It provides an overview of the position of the agriculture and fishing sectors in the national economy.

Assessment Strategies

Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)

Module Title:	RURAL SOCIOLOGY
Code	AAEC 3691
NQF level	6
Contact hours	Lectures: 3x 1hr L/wk for 14 weeks (42hrs)
NQF Credits	12
Prerequisites:	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This module investigates the basic sociological concepts and their application to agricultural progress and rural development planning; the significance of rural sociology to agricultural extension and rural development; differences between rural and urban population; culture and culture change, social interaction and social structures; groups and organization, deviance, social class and stratification; Social institutions families; religions; rural/urban migration and environment; social change in global perspective.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)

Module Title:	GENETICS
Code	AASC 3681
NQF level	6
Contact hours	Lectures: 3x 1hr L/wk for 14 weeks (42hrs); Practicals: 1 x 3hr Practical alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisites	None
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
This module covers Extension of Mendelian analysis and ratio – incomplete dominance, co-dominance, multiple alleles, gene interactions, pleiotropy, epistasis, lethal genes; Chromosome (Physical structure, Packaging, Karyotype and Variations); The Cell Cycle; Mitosis and its genetic significance; Meiosis and its genetic significance; Sex determination; Sex linkage and general examples of sex-linked inheritance; The molecular structure of DNA - the double helix model; DNA replication in prokaryotes and eukaryotes; Gene expression (Transcription and Translation); Regulation of gene expression – The *Lac* operon; Mutations (types, causes, detection and significance). The module also introduces students to basic molecular biology concepts. It examines molecular organization of the genomes (prokaryotes and eukaryotes) and molecular structure of genes; it introduces DNA based technology such as Polymerase Chain Reaction (PCR), DNA extraction, electrophoresis, sequencing, genetic engineering and animal cloning.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5x marked practicals).
Exam: 60% (1 x 2 hr paper).

Module Title:	ECOLOGY
Code	AIES 3681
NQF level	6
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42 hrs); Practicals: 1 x 3 hrs alternate for 14 weeks (21hrs)
NQF Credits	12
Prerequisites	None
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
Ecological concepts.Physical, chemical and biological parameters of the environment.Population characteristics; Sex ratio, age distribution, growth rate, Population processes, growth models; density dependent and independent population regulation. Estimating population size, life-table analysis, survivorship. Ecosystem processes: Trophic levels, Biomass, Nutrient cycling. Community ecology: Classification of communities (biogeoclimatic classification applied to Namibia),Diversity and its measurements. Conservation guilds (keystone, flagship and umbrella species).Habitat utilization.Dynamics (ecological succession) and stability.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3hr paper)

Module Title:	ENVIRONMENTAL SCIENCE
Code	AIES 3691
NQF level	6
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42 hrs); Practicals: 1 x 3 hrs alternate for 14 weeks (21hrs)
NQF Credits	12
Prerequisites	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
The concepts of; environment, natural resources, demography and land use. Major environmental concerns including pollution, soil erosion and degradation in crop and livestock production systems (Namibian context).Effects ofagrochemicals, desertification and methods of control, natural and man-made hazards.Effects of; human population growth, industrialization and urbanization on the environment.Energy sources and their environmental impacts.Waste management.Climate change and the environment.

Assessment Strategies
Continuous assessment 40% (At least three assessments) Examination 60% (1 x 3 hour paper)

Module Title:	GENERAL MICROBIOLOGY
Code	AFST 3681
NQF Level	*6*
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42 hrs): Practicals: 1 x 3 hrs alternate for 14 weeks (21hrs
NQF Credits	*12*
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course provides a student with a general overview of microbiology including their environment, classifications, their morphology, structures and chemical composition. The biology of bacteria, fungi, algae, protozoa and viruses.Effect of antibiotics on microorganisms, important pathogens of plants and animals.The role of microorganisms in general industries, food industries and in the soils.Concept of microbiology with special reference to microscopy, staining procedure, sterilization, aseptic, pure culture techniques and media preparation.

Assessment Strategies
Continuous Assessment 40% (minimum 2 tests, 2 assignments and 4 practicals). Examination: 60% (1 x 3 hr paper)

Module Title:	BIOCHEMISTRY
Code	AASC 3612
NQF Level	*6*
Contact hours	Lectures: 4x 1hr L/wk for 14 weeks (56hrs); Practicals: 1 x 3hr Prac/wk for 14 weeks (42hrs)
NQF Credits	*16*
Prerequisite	Chemistry for Life Sciences (CHM 3532)
Compulsory/Elective	Compulsory
Semester Offered	*2*

Module Content:
Under this course the students will learn about Physical biochemistry including acids, bases, buffers and pH; Structural biochemistry - learning about the Structure and function of carbohydrates, proteins and lipids. Bioenergetics and Thermodynamics (Free energy, Laws of energy, Endergonic and exergonic reactions); Enzymology (Enzymes as organic catalysts Enzyme nomenclature Enzyme kinetics Factors affecting activities of enzymes The Michaelis-Menten equation The Lineweaver-Burk plot Enzyme inhibition Competitive inhibition Non competitive inhibition Enzyme activity regulation Allosterism Cofactors); Vitamins and coenzymes (Water-soluble vitamins Fat-soluble vitamins); Metabolism (Anabolism and catabolism overview Carbohydrate catabolism Glycolysis Alcohol and lactic acid fermentation Cori cycle Gluconeogenesis Synthesis of the disaccharides lactose and sucrose Synthesis of polysaccharides starch and glycogen Regulation of carbohydrate metabolism Metabolic disorders in carbohydrate metabolism Pentose phosphate pathway Tricarboxylic acid cycle Glyoxylate cycle in oily seeds Photosynthesis Electron transport system and oxidative phosphorylation Fat metabolism Integration of carbohydrate and fat metabolism); Electrophoresis.

Assessment Strategies
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5x marked practicals).Exam: 60% (1 x 3 hr paper)

Module Title:	CLIMATOLOGY AND HYDROLOGY
Code	AIES 3622
NQF level	6
Contact hours	Lectures: 2x 1hr/wk for 14 weeks (28hrs); Practicals: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	8
Prerequisites	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Introduction to Climatology concepts; weather, meteorology, climate, climatology and atmosphere.Weather systems and weather forecasting; weather parameters, world weather systems, Namibia weather conditions, weather forecasting.Climate; climatic data, climatic classifications, climatic zones of the world, climatic zones of Namibia, Climate change.Hydrology; parameters and their measurement.Hydrologic cycle; elements and their estimation. Groundwater hydrology-aquifers, water table and aquifer recharge.

Assessment Strategies
Continuous Assessment: 40% (At least three assessments); Examination: 60% (1 x 2 hr paper)

Module Title:	NATURAL RESOURCE ECONOMICS
Code	AFAS 3682
NQF level	6
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisites	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Natural resource economics: Renewable and non-renewable resources; natural- and man-made capital: Conservation and development. Sustainability: Resource scarcity and population growth; ecocentric vs. anthropocentric approach; Resource use; the precautionary use of user-pay principle; Economic growth and sustainable development. Brundtlandreport. Market failures: public goods, externalities. Valuing natural resources: surrogate market techniques, travel time, contingency valuation methods, non-use values; opportunity costs.

Assessment Strategies
Continuous Assessment: 40% (at least three assessments); Examination: 60% (1 x 3 hr paper)

Module Title:	PLANT PHYSIOLOGY
Code	AIES 3682
NQF level	6
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42 hrs); Practicals: 1 x 3 hrs alternate for 14 weeks (21hrs)
NQF Credits	12
Prerequisites	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Growth and development in plants; development of plant organs, growth hormones, flowering physiology, seed physiology and dormancy.Photosynthesis.Respiration.Plant water relations.Mineral absorption and utilization. Factors affecting plant growth and distribution. Stress physiology.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	SOIL SCIENCE FOR CROP PRODUCTION
Code	ACRS 3682
NQF Level	6
Contact hours	03 Lecture hours / week for 14 weeks; 02 Practical hours / week for 14 weeks
Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

Definition of soil. Soil formation. Soil as a triphasic system: texture, soil organic matter, soil organisms and nutrient cycles. Clay minerals, soil colloids and cation exchange capacity; Soil structure. Bulk density. Soil moisture, soil water potential and movement in saturated and unsaturated soils; field capacity and water holding capacity. Basics of soil fertility and plant nutrition: macro- and micro-nutrients and their functions, pH and nutrient availability. Soil classification: soil profile, horizons, and influence of environmental factors. Common soil classification systems: USDA (soil taxonomy) and FAO classification systems. Major soil types

Assessment Strategies

Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

J.2.3 THIRD YEAR MODULES

Module Title:	DRYLAND PLANTS
Code	AIED 3781
NQF level	7
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42 hrs); Practicals: 1 x 3 hr alternate for 14 weeks (21hrs)
NQF Credits	12
Prerequisites	None
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:

Introduction to plant taxonomy; scope of plant taxonomy,classification,nomenclature, identification and herbarium practice. Taxonomy, botanical characteristics and ecology of key exotic and indigenous plant species in Namibiaincluding; timber and fuel-wood plants, fruit and food plants, fodder plants and medicinal plants (emphasis on grasses, shrubs and trees). Non-woody woodland products. Forest product development.

Assessment strategies

Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	PRINCIPLES OF WILDLIFE MANAGEMENT
Code	AIEP 3781
NQF level	7
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 3hrs alternate for 14 weeks (21hrs)
NQF Credits	12
Prerequisites	None
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:

An introduction to basic principles used in the management of wildlife populations, their habitats and their human users. General concepts in: ecological processes; population dynamics and structure; sampling in wildlife; life history patterns, biotic and abiotic factors structuring wildlife populations and endangered species.Home range and territoriality; coloniality; mating systems; hierarchy. Response of wildlife to humans.Plant-herbivore system.Herbivore-carnivore system.Predation of domestic animals by wild animals. Nutritional ecology (anatomy and physiology; feeding ecology; diet composition and analysis; nutritional value of plants; plant chemicals and toxins; management of toxic plants and affected game; grazing and browsing capacity; mineral deficiencies and supplementary feeding; nutrition in captivity). Animals and their characteristics.Management techniques of wildlife.Ranch (habitat) management.Genetic management.Wildlife management and rural development.

Assessment strategies

Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title: FIELD ATTACHMENT I

Code	AACA 3701
NQF Level	*7*
Contact hours	Six weeks of Field Attachment
NQF Credits	*6*
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content:
Six weeks of field attachment; at the end of the second year, students will be attached to industries and institutions dealing with environmental/natural resource management selected to ensure that the objectives of on-site training are attained. An attachment report and oral presentation will constitute the total assessment mark. Students will be visited during their attachment on-site to check on the efficiency of attachment.

Assessment strategies:.50 % report presentation at a seminar; 50 % Field report. Subject to satisfactory attendance and good conduct during attachment.

Module Title:	AGROFORESTRY
Code	AIEA 3781
NQF level	7
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 3hrs alternate for 14 weeks (21hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
Introduction to agroforestry; definition and principles of agroforestry, integrated land-use system, need for agroforestry, causes and consequences of deforestation. Land-use systems and possible agroforestry intervention.Multi-purpose tree species and their uses.Agroforestry systems and practices including apiculture.Agroforestry demonstration plots.Ecological and economic interactions.Agroforestry development in

Module Title:	BIOSTATISTICS
Code	ACRS 3681
NQF Level	
Contact hours	3 lecture hours / week for 14 weeks; 3 tutorial / practical hours alternate weeks for 14
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Namibia and the SADC region – case studies.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Content:
Definition of statistics, descriptive and inferential statistics. Qualitative and quantitative data, primary versus secondary data. Sampling and sample size determinations, and replications. Presentation of data: tables, charts, graphs. Measures of central tendency: mean, mode, median. Measures of dispersion: standard deviation, coefficient of variation, standard error. Probability, Bayes' theorem, combinations and permutations, Binomial, Poisson, and Normal distributions, T-test and F- distribution mean comparisons, Analysis of variance, analysis assumptions. Single and multiple factor experiments, correlation and linear regression, transformations. Research process: research problem formulation, research objectives, hypothesis formulation. Basic experimental designs: completely randomized, randomized complete block, Latin square, Split plot.

Assessment Strategies
Continuous assessment (40%): at least three assessments; Examination (60%): 01 x 02 hour examination paper

Module Title:	NATURE CONSERVATION
Code	AIEN 3792
NQF level	7
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42 hrs); Practicals: 1 x 3 hr/wk alternate for 14 weeks (21 hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Concepts of nature conservation.Values and ethics of conservation.Species conservation.Extinction and Endangered Species.Key and Charismatic Species.Conservation Strategies.Conservation and Sustainable Development.Genetic conservation.Introductions and re-introductions.Nature Conservation in Urbanized and Agricultural Ecosystems.Environmental Impact Assessment (environmental impact of human activities on natural resources; environmental consideration in physical planning; impact identification, monitoring and mitigation; formal environmental assessment).Environmental Education. The economics of conservation.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	GEO-INFORMATICS
Code	AIES 3791
NQF level	7
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr alternate for 14 weeks (14hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Basic concepts, GIS data structures, processing and analysis techniques, basic cartography, map projections, introduction to GPS, basic aerial photograph interpretation. Use of GIS software. Use of GPS receiver. Display and manipulation of image files. Remote sensing for land use/land cover identification and vegetation monitoring.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	NATURE CONSERVATION
Code	AIEN 3792
NQF level	7
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr alternate for 14 weeks (14hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Principles of law with particular reference to environment, forestry and wildlife resources.Legal process governing environment and industrial pollution.Specific environmental acts and statutes dealing with environment, forestry and wildlife. Introduction to International environmental law and International Conventions; Policies: design, implementation, evaluation of policy impacts. Law enforcement in management of natural resources

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT
Code	AIES 3702
NQF level	7
Contact hours	Lectures: 2 x 1hr/wk for 14 weeks (28hrs); Practicals: 1 x 2hr alternate for 14 weeks (14hrs)
NQF Credits	8
Pre requisite	None

Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Rural development and livelihoods: concepts and principles. Principles of devolution, proprietorship, incentives, authority and responsibility over natural resources.Rural livelihood strategies.Local institutions for CBNRM; community forestry and conservancies:definition and approaches, aims and objectives,history, policy and strategies relevant to community forestry and conservancies. Technical and management alternatives to integrated forest management. Case studies on community forestry and conservancies.The role of governance, participation, communication and community capacity building on CBNRM.Natural resources monitoring and adaptive utilization.Enterprise development and benefit sharing.Management of conflicts over natural resources. Indigenous knowledge on conservation of natural resources

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 2 hr paper)

Module Title:	AGRICULTURAL EXTENSION
Code	AAEC 3712
NQF Level	7
Contact hours	Lectures: 4 x 1hrL/W for 14 weeks (56hrs); Practicals: 1 x 1hr Prac/W for 14 weeks(14 hrs)
NQF Credits	16
Prerequisite	AAEC 3691 Rural Sociology
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The course explore Extension concepts; principles and theories; compare Modern and Traditional Extension; agricultural extension as adult learning; extension methods; definition and importance of program extension; philosophy and principles of program development in extension; Comparing agricultural extension approaches (FSRE); Science and Indigenous knowledge systems and participatory appraisal techniques ; Social change and innovation; Attributes of Innovations and their rate of adoptions; Elements in diffusion of Innovations; Motivational theories; Community participation and involvement in extension, PRA methodologies and techniques; Improving the organisation and management of extension; establishing and strengthening farmer's organisations.

Assessment Strategies
Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 3 hour paper)

Module Title:	RESEARCH METHODS
Code	ACSC 3792
NQF Level	7
Contact hours	03 lecture hours / week for 14 weeks; 3 tutorial hours / practical hours alternate weeks for 14 weeks
NQF Credits	12
Co-requisite	ACSC 3692: BIOSTATISTICS
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Students will be exposed to more advanced statistical concepts and research methods above those covered in Biostatistics. Comparison between parametric and non-parametric statistics. Non-parametric statistics: goodness of fit tests; tests of association, Chi Square tests; paired comparisons, Wilcoxon's tests; rank correlation; Multivariate methods: multiple regression, discriminant analysis, canonical analysis, multidimensional scaling, principal component analysis. Review of experimental designs with emphasis to livestock, crop and game animal experimentation. Review of procedures for implementing research projects and presentation of research results with emphasis to practical field situations and case studies. Introduction to Statistical Computer packages

Assessment strategies
Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)

J.2.4 FOURTH YEAR COURSES: FORESTRY SPECIALIZATION

Module Title:	RESEARCH PROJECT (FORESTRY)
Code	AFOR 3810
NQF level	8
Contact hours	Consultation: 1 x 1hr/wk for 28 weeks (28 hrs)
NQF Credits	32
Pre requisite	ACSC 3792: Research Methods
Compulsory/Elective	Compulsory
Semester offered	1&2

Module Content:
Senior undergraduate students carry out independent study of a current topic in natural resources and agriculture. The course include participation in meetings organized by the coordinator, work with a faculty advisor to develop a research project, formulate hypotheses, design and carry out preliminary experiments and collect data and test the hypotheses. Students will carry out independent library research, begin experimental work, prepare a written report and make a presentation to other students the proposal and final report. The student will submit a final report written following Guidelines for Scientific Writing.

Assessment strategies
Continuous assessment: 100% (research proposal write up and presentation of proposal in a seminar, presentation of empirical findings in a second seminar, and grading of the final report).

Module Title:	SILVICULTURE
Code	AFOR 3881
NQF level	8
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr alternate for 14 weeks (14hrs)
NQF Credits	12
Pre requisite	AIES 3681: Ecology; AIES 3682: Plant Physiology
Compulsory/Elective	Compulsory
Semester offered	1

Module content:
Definitions and relations with other disciplines.Forest stand dynamics.. Forest plantations: plantation forestry in Southern Africa: justification and historical perspective. Planning of plantation: site selection, choice of species and provenances.Nursery practice.Seed collection, processing, storage and treatment.Forest establishment: site preparation, establishment methods:natural regeneration, coppicing, planting – direct seeding and transplanting. Forest tree maintenance: post planting problems, fertilization, irrigation, weed control, protection, pruning and thinning.Applicable silvicultural systems.Silviculture of selected indigenous and exotic species.Theory and practice of tree improvements

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	FOREST PROTECTION
Code	AFOR 3891
NQF level	8
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr alternate for 14 weeks (14hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
The concept of disease, biotic and abiotic causes of plant diseases: Introduction to plant pathogenic organisms with special reference to forest pathogens; Principles of plant infection, disease establishment and spread; Major plant pathogens in Southern Africa, their etiologies and methods of control; Plant quarantine procedures in Southern Africa. Biology, ecology and control (cultural, chemical and biological) of major forest insect pests and stem/wood borers; Useful forest insects. Forest Fire Management: causes, prevention and suppression.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	FOREST MENSURATION
Code	AFOR 3881
NQF level	8
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr alternate for 14 weeks (14hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
Introduction; importance of forest mensuration, scientific basis of measurement, Measurement scales. Precision, Accuracy and biases in measurements. Measurements of tree parameters: diameter, height, tree form/taper/stem analysis and bark thickness. Tree age and growth determination.Volume calculation estimations.Wood weight estimates, density and moisture content.Estimation of stand parameters; basal area, volume, stocking, species diversity, structure and composition. Stand growth and increment: CAI, PAI, MAI. Site quality assessment.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	FIELD ATTACHMENT II
Course Code	AACA 3701
NQF Level	*7*
Contact hours	Six weeks of Field Attachment
NQF Credits	*8*
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content
Six weeks of field attachment; at the end of the third year first semester, students will be attached to industries and institutions dealing with environmental/natural resource management selected to ensure that the objectives of off-site training are attained. An attachment report and oral presentation will constitute the total assessment mark. Students will be visited during their attachment on-site to check on the efficiency of attachment.

Assessment strategies:.50 % report presentation at a seminar; 50 % Field report. Subject to satisfactory attendance and conduct during attachment.

Module Title:	PROJECT PLANNING AND MANAGEMENT
Code	AGEC 3881
NQF level	8
Contact hours	Lectures: 3x 1hrL/W for 14 weeks (42hrs); Practicals: 1 x 1hr Prac/W for 14 weeks (14 hrs)
NQF Credits	12
Pre requisite	AAEC 3691 Principles of Microeconomics
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
The course includes topics such as: planning process, project cycle, logical framework, financial and economic analysis of project; Project feasibility and appraisal techniques (pay back period, the time value of money, Net Present Value, Benefit cost Ratio, and Internal Rate of Return), and sensitivity analysis; Project monitoring and evaluation, leadership, control, and the problems of identifying project costs and benefits and dealing with sustainability in project implementation

Assessment Strategies
Continuous assessment 60% (minimum 2 tests and 1 assignment) Examination 40% (1 x 3 hour paper)

Module Title:	FOREST INVENTORY
Code	AFOR 3882
NQF level	8
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr alternate for 14 weeks (14hrs)
NQF Credits	12

Pre requisite	AFOF 3881: Forest Mensuration
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Introduction to forest inventory.Purpose and planning of forest inventory. Sampling and samplings design;simple random sampling, systematic sampling, stratified sampling, cluster sampling, regression estimators, double and two stage sampling, point sampling. Types of forest inventory.Volume estimation of selected indigenous species.Assessment of other forest values.Data recording and processing in forest inventory.Recent developments in forest resource assessment.Introduction to remote sensing and its application in forest inventory.Interpretation of aerial photographs and forest classification.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	FOREST ECONOMICS AND MARKETING
Code	AFOR 3812
NQF level	8
Contact hours	Lectures: 4 x 1hr/wk for 14 weeks (56hrs); Practicals: 1 x 2hr/wk for 14 weeks (28hrs)
NQF Credits	16
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Forest economic concepts, economics of resource conservation.Peculiarities of forestry: production period, interest rates. Costing of forest operations and their analysis.Methods of input costing – private versus social costs and private versus social benefits.Depreciation methods and determination of maintenance costs.Techniques of appraising forest investments: NPV, IRR, CBR, Subsidies, taxes, interest rates, risks and uncertainties. Economics of forestry operation: choice of species, spacing, economics of pruning, thinning, extraction..Forest valuation: stumpage appraisal, valuation of forest land, forest rotation. Principles of shadow pricing, economies and diseconomies of scale in forestry operations.Maximum sustainable yield and maximum economic yield. Work-study procedures... Economics of forest conservation. Techniques of evaluating protected areas: recreation sites, national parks, community forests, conservancies, etc. Principles of marketing, market research and promotion.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	FOREST MANAGEMENT
Code	AFOR 3892
NQF level	8
Contact hours	Lectures: 4 x 1hr/wk for 14 weeks (56hrs); Practicals: 1 x 2hr/wk for 14 weeks (28hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Scope of forest management.Theory and practice of normal forest.Estimation of growth and yield: growing site index equations, yield models, current yield and future yields. Sustained yield. Rotation, allowable cut, cutting cycle. Sustainable exploitation of woodlands (community forests, concession areas, private woodlands (private farms).Transportation of wood materials, Ergonomics and work safety.Forest management plans; development, implementation, monitoring and evaluation.Forest organisation in Namibia.Administration of forest enterprises; records, personnel management, programs of work.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

J.2.5 FOURTH YEAR COURSES: ENVIRONMENTAL SCIENCE SPECIALIZATION

Module Title:	RESEARCH PROJECT (ENVIRONMENTAL SCIENCE)
Code	AENV 3810
NQF level	8
Contact hours	Consultation: 1 x 1hr/wk for 28 weeks (28 hrs)
NQF Credits	32
Pre requisite	ACSC 3792: Research Methods
Compulsory/Elective	Compulsory
Semester offered	1 and 2

Module Content:
Senior undergraduate students carry out independent study of a current topic in natural resources and agriculture. The course include participation in meetings organized by the coordinator, work with a faculty advisor to develop a research project, formulate hypotheses, design and carry out preliminary experiments and collect data and test the hypotheses. Students will carry out independent library research, begin experimental work, prepare a written report and make a presentation to other students the proposal and final report. The student will submit a final report written following Guidelines for Scientific Writing.

Assessment strategies
Continuous assessment: 100% (research proposal write up and presentation of proposal in a seminar, presentation of empiricalfindings in a second seminar, and grading of the final report).

Module Title:	FIELD ATTACHMENT II
Code	AACA 3701
NQF Level	7
Contact hours	Six weeks of Field attachment
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Content
Six weeks of field attachment; at the end of the third year, semester 1, students will be attached to industries and institutions dealing with environmental/natural resource management selected to ensure that the objectives of off-site training are attained. An attachment report and oral presentation will constitute the total assessment mark. Students will be visited during their attachment on-site to check on the efficiency of attachment.

Assessment strategies:.50 % report presentation at a seminar; 50 % Field report. Subject to satisfactory attendance and conduct during attachment.

Module Title:	ENVIRONMENT AND DEVELOPMENT
Code	AENV 3881
NQF level	8
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr/wk for 14 weeks (28hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
Concepts of development and underdevelopment. Measurements of development. Links between environment and development. Sustainable development; concepts, principles(Triple bottom line) and approaches. National approaches and tools for sustainable development; EIA, state of the environment reporting, national strategy.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	ENVIRONMENTAL POLLUTION AND CONTROL
Code	AENV 3891
NQF level	8
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr alternate for 14 weeks (14hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
The environment as a source and sink of resources and wastes.The concept of environmental degradation and pollution.The state of environmental pollution in Namibia.Classification of pollutants.Types of urban pollution.Measurement, dispersion and transportation of urban pollutants.Impact of urban pollution. Control strategies. Domestic/industrial water pollution; measurement, treatment and control.Agricultural pollutants and ecosystems. Use of environmentally friendly agrochemicals and fertilizers and alternative methods of pest control (biotechnology).

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	WATERSHED MANAGEMENT
Code	AENV 3801
NQF level	8
Contact hours	Lectures: 2 x 1hr/wk for 14 weeks (28hrs); Practicals: 1 x 2hr/wk for 14 weeks (28hrs)
NQF Credits	8
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	1

Module Content:
The watershed as a unit of resource-oriented planning and development.Principles and objectives of watershed management.Physical description of watersheds. Relationships between land use conditions and water delivery characteristics of watersheds. Management and development of water sources in Namibia; perennial and ephemeral rivers, underground water, role of river basin authorities.Water harvesting.Watershed analysis including;techniques, collection of field data and sources of information.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	MANAGEMENT OF ARID AND SEMI-ARID LANDS
Code	AENV 3882
NQF level	8
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr/wk for 14 weeks (28hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Characteristics of arid and semi-arid lands; concept of aridity, categories of drylands, characteristics of drylands, changes in drylands. Land use practices; traditional land use practices, crop production, pastoralism, game ranching, tourism and wildlife. Environmental management issues; desertification, land degradation, and prevention of land degradation.Types and methods of Interventions in management of drylands and their impacts.Reclamation and sustainable development of ASALS. Case studies in Namibia and the SADC region.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Course title:	ENVIRONMENTAL PLANNING AND MANAGEMENT
Code	AENP 3882
NQF level	8
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr/wk for 14 weeks (28hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Concepts of planning and management.Planning tools and processes: physical, human and institutional resources.Basic methods in planning and management of the environment. Environmental management plans: types, development, implementation, monitoring and evaluation.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	ENVIRONMENTAL IMPACT ASSESSMENT
Code	AENE 3882
NQF level	8
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr/wk for 14 weeks (28hrs)
NQF Credits	12
Pre requisite	AIES 3782: Natural Resource Governance
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
Definitions: impact assessment, Environmental studies, Environmental Impacts of Human Activities on Natural Resources; impact on atmosphere, impact on water bodies, impact on wildlife, impact on forests; Environmental considerations in Physical planning. Impact identification, monitoring and mitigation; methods of identifying impacts, methods of monitoring environmental impacts, types of mitigation actions. Formal Environmental Impact Assessment: Origins and significance of formalized approach; historical context and rationale; major issues in formal EIA process; procedure of formal EIA process, common methodologies and examples o their application, Choosing an appropriate methodology. Policy and Framework in Namibia: monitoring and quality control, role of Departmental Affairs; EIA in Namibia.

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	ENVIRONMENTAL EDUCATION
Code	AENE 3892
NQF level	8
Contact hours	Lectures: 3 x 1hr/wk for 14 weeks (42hrs); Practicals: 1 x 2hr/wk for 14 weeks (28hrs)
NQF Credits	12
Pre requisite	None
Compulsory/Elective	Compulsory
Semester offered	2

Module Content:
General principles of environmental education. Environmental awareness and ethics. Environmental educational institutions: nature history museums, herbaria, zoos and botanical gardens, national parks, reserves. Methods of environmental education.Publicizing and advertising environmental issues.Environmental education in primary and secondary schools in Namibia.Environmental education in media.Environmental education at regional and global level

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3hr paper)

K. B.SC. WILDLIFE MANAGEMENT & ECOTOURISM (HONS) [17BSWL]

All modules listed below, except English Communication and Study Skills, English for Academic Purposes and Contemporary Social Issues, will be offered by Faculty of Science. English Communication and Study Skills, English for Academic Purposes, Contemporary Social Issues and Computer Literacy are University Core Modules taken by all First Year University of Namibia students.

K.1 PROGRAMME SCHEDULE

Course code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 1 Semester 1					
UCLC 3509	Computer Literacy	5	8	C	
ULCE 3419	English Communication and Study Skills	4	16	C	
SBLG 3511	Introduction to Biology	4	16	C	
HGHE 3581	Fundamentals of Physical Geography	5	12	C	
SMAT 3511	Basic Mathematics	5	16	C	
Total Credits Semester 1					68
Year 1 Semester 2					
ULEA 3519	English for Academic Purposes	5	16	C	
UCSI 3580	Contemporary Social Issues	5	8	C	
SCHM 3532	Chemistry for Life Sciences	5	16	C	
SBLG 3512	Diversity of Life	5	16	C	
HGHE 3582	Fundamentals of Human Geography	5	12	C	
Total credits Semester 2					68
TOTAL CREDITS YEAR 1					136

Year 2 Semester 1					
AWLM 3601	Wildlife Management	6	8	C	
AWLM 3631	Ecotourism	6	16	C	
AWLM 3621	Wildlife Nutrition	6	8	C	
AWLM 3651	Systematic Botany	6	16	C	
AWLM 3681	Freshwater Ecology	6	12	C	
ACRS 3681	Biostatistics	6	12	C	None
Total Credits Semester 1					72
Year 2 Semester 2					
AWLM 3632	Wildlife Ecology	6	16	C	
AWLM 3682	Ornithology	6	12	C	
AWLM 3602	Mammalogy	6	8	C	
AWLM 3642	Wildlife Diseases	6	8	C	
AWLM 3612	Ecology of African Ecosystems	6	16	C	
AWLM 3662	Geo-informatics for Wildlife Management	6	8	C	CLC 3509: Computer Literacy
AWLE 3602	Ethnobotany	6	8	C	WLM3651 Systematic Botany
Total credits Semester 2					76
TOTAL CREDITS YEAR 2					148

Year 3 Semester 1					
AWLM 3701	Governance of Wildlife Resources	7	8	C	AWLM 3601: Wildlife Management
AWLM 3781	Wildlife Conservation	7	12	C	HGHE 3582: Fund. Phys. Geography
AWLM 3721	Ecological Methods in Wildlife Studies	7	8	C	AWLM 3632: Wildlife Ecology
AWLM 3741	National Parks & Game Reserves	7	8	C	AWLM 3781: Wildlife Conservation
AWLM 3712	Animal Behaviour	7	16	C	AWLM 3682: Ornithology; AWLM 3602: Mammalogy
AACA 3701	Field Attachment I	7	8	C	
Total Credits Semester 1					60
Year 3 Semester 2					
AWLM 3702	Genetic Conservation	7	8	C	AWLM 3781: Wildlife Conservation
AWLM 3722	Wildlife Survey & Monitoring Techniques	7	8	C	
AWLM 3742	Habitat Management	7	8	C	AWLM 3781: Wildlife

					Conservation; AWLM 3601: Wildlife Management
AWLM 3732	SystematicS of Birds and Mammals	7	16	C	AWLM 3682: Ornithology; AWLM 3602: Mammalogy
AWLM 3782	Herpetology & Terrarium	7	12	C	AWLM 3611: Wildlife Ecology
CSC 3792	Research Methods	7	12	C	ACRS 3681: Biostatistics
Total credits Semester 2					64
TOTAL CREDITS YEAR 3					124

Year 4 Semester 1					
AWLM 3801	Freshwater Ichthyology & Aquaculture	8	8	C	AWLM 3681: Freshwater Ecology
AWLM 3811	Entomology	8	16	C	SBLG 3512: Diversity of Life
AWLM 3821	Economics of Wildlife Resources	8	8	C	AWLM 3601: Wildlife Management
AWLM 3881	Environmental Impact Analysis	8	12	C	AWLM 3632: Wildlife Ecology
ACA 3801	Field Attachment II	8	8	C	
AWLM 3810	Research Project	8	16	C	CSC 3792: Research Methods
Total Credits Semester 1					66
Year 4 Semester 2					
AWLM 3802	Ecotourism Marketing and Travel Plan Development	8	8	C	
AWLM 3822	Wildlife in Agriculture Ecosystems	8	8	C	
AWLM 3882	Biogeography	8	12	C	AWLM 3662: Geo-Informatics for WLM
AWLM 3841	Digital Wildlife Photography	8	8	C	
AWLM 3842	Environmental & Ecotourism Education	8	8	C	ACSI 3580: Contemporary Social Issues
AWLM 3810	Research Project	8	16	C	ACSC 3792: Research Methods
Total credits Semester 2					60
TOTAL CREDITS YEAR 4					126
	TOTAL CREDITS FOR THE PROGRAMME				534

K.2 MODULE DESCRIPTORS

K.2.1 FIRST YEAR MODULES

CLC3509 COMPUTER LITERACY

Module title: COMPUTER LITERACY
Code: CLC3509
NQF level: 5
Contact hours: 1 lecture theory and 1 lecture practical per week for 14 weeks
Credits: 8
Module assessment: Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%
Prerequisites: University Entry

Module Content:
The module covers the following topics. Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system: File Management, working with multiple programs, using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge. Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the workbook. Databases: creating tables, relationships, queries, forms and reports. Presentation software: slide layout and master, animations, auto-content wizard and templates. Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

LCE3419 ENGLISH COMMUNICATION & STUDY SKILLS

Module title:	ENGLISH COMMUNICATION AND STUDY SKILLS
Code:	LCE3419
NQF Level:	4
Contact hours:	4 hours per week for 14 weeks
Credits:	16
Module Assessment:	Continuous assessment (60%): two tests (reading and writing), two reading assignments, one oral presentation Examination (40%): one three hour examination paper
Pre-requisites:	None

Module Content:

This module is aimed at assisting students in the development of their reading, writing and speaking and listening skills, in order to cope with studying in a new academic environment and in a language which may not be their first language. The module also focuses on study skills that students need throughout their academic careers and beyond. The module serves as an introduction to university level academics, where styles of teaching and learning differ from those at secondary schools in that more responsibility is placed on the student. The module therefore, focuses on the skills that students need throughout their academic careers and beyond.

SBLG 3511: INTRODUCTION TO BIOLOGY

Module title:	INTRODUCTION TO BIOLOGY
Code:	SBLG 3511
Course Equivalent:	Biology 1A
NQF level:	4
Contact hours:	4 lectures/ week for 14 weeks and one 3-hour practical session per week.
Credits:	16
Module assessment:	Continuous assessment (40%): Theory (not less than 3 tests and 2 assignments), 40%. Practicals (not less than 10 marked assignment), 60%. Examination (60%): 3 hour examination paper.
Prerequisites:	NSCC (Biology C or better)

Module Content:

It will consider organization of life, chemical basis of life, carbohydrates, proteins, nucleic acids, lipids and fats, water, cell structure and function, prokaryotic and eukaryotic cells, ultra-structure of plant and animal cells, cytoskeleton, membrane structure and function, cell communication, mitosis, meiosis, cell reproduction, cell cycle, and cell death. The following topics will be covered: Introduction to systems of classification, taxonomy and binomial nomenclature, including the five kingdoms and the three domein system. Definitions and categories/groups within the five kingdoms, evolution by natural selection (microevolution vs macroevolution), phylogeny and evolutionary relationships in five kingdoms. The course content will also include genes, chromosomes, genomes, Mendelian genetics, extensions to Mendelian genetics, chromosome theory of inheritance, linkage and cross-over, recombination, sex determination. The course content will also cover an introduction to Ecology: Definitions, history, scales in ecology, application of ecology. Conditions and Resources: Environmental conditions, animals and their resources, plants and their resources.

HGHE 3581: FUNDAMENTALS OF PHYSICAL GEOGRAPHY

HGHE 3581 Fundamentals of Physical Geography

Proposed NQF Level:	5
Credits:	12
Contact Hours:	3 hours/weeks over 14 weeks = 42 contact hours

Module Content:

Students acquaint themselves with the essential foundations of Physical Geography, including common links to auxiliary disciplines and fields of study. The course presents structures, functions, processes and distributional patterns inherent in phenomena of "natural" environments, relating to climate, geomorphology, hydrology, soils and vegetation. The content focuses on the interrelationship of geo-ecosystems, including the human factor. With particular reference to Namibian conditions, the course offers fundamental applications of concepts inherent in the functioning of the atmo-, litho-, hydro- and biosphere.

Assessment: Continuous assessment 60% : Examination 40% (1 x 3 hour examination paper)

SMAT 3511: BASIC MATHEMATICS

Module name:	BASIC MATHEMATICS
Code:	SMAT 3511
NQF level:	5
Contact hours:	4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits:	16

Module Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination
Prerequisite:	paper). NSSC Mathematics

Module Content:
Sets: notations and diagrams to represent sets, subset, empty set, equality of sets, intersection, union, complement. Algebraic expressions: simplification, expansion, polynomials, reminder and factor theorem, partial fractions. Trigonometry: trigonometric functions, basic trigonometric identities. The absolute value, linear equations, linear inequalities, quadratic equations, the quadratic formula, quadratic inequalities. Functions: domain, codomain, image, preimage, even function, odd function. Sequences: the general term, the geometric sequence, the arithmetic sequence. The Binomial Theorem.

LEA3519 ENGLISH FOR ACADEMIC PURPOSES

Module title:	ENGLISH FOR ACADEMIC PURPOSES
Code:	LEA3519
NQF level:	5
Contact hours:	4 periods per week for 14 weeks
Credits:	16
Module assessment:	Continuous assessment (60%): 2 tests (reading and writing), 1 academic written essay,1 oral presentation Examination (40%) : One three hour examination paper
Prerequisites:	None

Module Content:
This module develops a student's understanding, and competencies regarding academic conventions such as academic reading, writing, listening and oral presentation skills for academic purposes. Students are required to produce a referenced and researched essay written in formal academic style within the context of their university studies. Students are also required to do oral presentations based on their essays. The reading component of the course deals with academic level texts. This involves students in a detailed critical analysis of such texts. The main aim is therefore, to develop academic literacy in English.

CSI 3580 CONTEMPORARY SOCIAL ISSUES

Code	CSI 3580
NQF Level	5
Contact hours	Equivalent to 1 hour per week for two semesters (Online)
NQF Credits	8
Prerequisite	None (University Core Module)
Compulsory/Elective	Compulsory
Semester Offered	1 & 2 (Year Module)

Module Descriptor (Rationale of the module):

The module, Contemporary Social Issues (CSI3580), is designed to encourage behavioural change among UNAM students and inculcate the primacy of moral reasoning in their social relations and their academic lives. In providing students with critical and analytical thinking the module enables students to grow and develop into well rounded citizens, capable of solving contemporary social challenges experienced in their communities and societies. The teaching of the module takes three dimensions: the intellectual, the professional and the personal dimensions. The intellectual dimension is fostered through engaging students with subject knowledge, independent learning and module assessment. The professional dimension, on the other hand, is fostered through exposing students to real life situations of case studies and practical exercises that draws attention to social issues that attract ongoing political, public and media attention and/or debate. Finally, the professional dimension is fostered through group work, online discussions and class participation.

SCHM 3532: CHEMISTRY FOR LIFE SCIENCES

Module Title:	CHEMISTRY FOR LIFE SCIENCES
Code:	SCHM3532
NQF Level:	5
Contact Hours:	56 hours of lectures, 42 hours of practical sessions.
Credits:	16
Module Assessment:	CA: 50% (minimum 3 tests 80%, laboratory component 20%, tutorial assignments 10%). Final Exam: 50%; (1 x 3 hour exam paper)
Pre-requisites:	None

Module Content:
Classification of Matter: Mixtures and Pure substances; Physical States of Matter; Physical and Chemical Properties. Extensive and Intensive properties.

Measurements: Units, Significant figures; Precision and Accuracy, Factor Label Method. Atomic structure and the Periodic table; Electron configuration; Physical and Chemical properties as predicted from groups. Ionic compounds and Molecular compounds: Writing chemical formulae and naming of ionic and molecular compounds. Average Atomic Mass. The Mole Concept; Percent Composition, Empirical formula and Molecular formula. Stoichiometry: limiting reagent, percent yield. Solutions: electrolytes and non-electrolytes, aqueous solutions, ionic equations; concentrations: percent concentration; molarity, molality; dilution of solutions; structure and solubility. Types of bonds; Lewis structures; Resonance structures; Molecular geometry: the VSEPR model, Polarity of molecules. Acid-base equilibrium: properties of acids and bases; relations of acids and bases, self ionisation of water; strengths of acids and bases; the pH scale; hydrolysis of salts; buffers; acid-base titration. Introduction to organic chemistry: organic compounds; structural formulae and conformations; functional groups; Classes of hydrocarbons: alkanes, cycloalkanes: alkanes; alkenes and alkynes; oxidation and reduction; addition reactions; stereo-isomerism. Alcohols, phenols, thiols, ethers: organic compounds of oxygen; common alcohols and phenols. Carboxylic acids and esters, amines and amides: Introduction to carbohydrates, lipids and porphyrins.

SBLG 3512: DIVERSITY OF LIFE

Module title:	DIVERSITY OF LIFE
Code:	SBLG 3512
Course Equivalent:	NSSC (/HIGH GRADE) Biology
NQF level:	5
Contact hours:	4 lecture periods / week for 14 weeks and one three hour practical session per week
Credits:	16
Module assessment:	Continuous assessment: Theory (not less than 3 tests and 2 Assignments) 40% Practicals (not less that 10 marked assignments) 50% Examination: 60% (1 x 2 hour examination paper)
Prerequisites:	NSCC (Biology C or better)

Module Content:

This module is designed to give students a detailed understanding of the diversity of life. It gives students the broader appreciation of biodiversity in the different ecological habitats. The course shall describe diagnostic characteristics of principle taxonomic categories for each phylum. Coverage of each Phylum shall follow a phylogenetic (evolutionary) approach as well as introduce broad ecological and physiological principles. Various aspects of reproduction and development shall be highlighted. This module prepares students to understand subsequent courses such as Introduction to Ecology and Microbiology, Population Ecology, Comparative physiology, Biogeography, Plant and Animal Form and Function

Topics covered will include viral, bacterial, fungal, algal, animal and plant diversity. It then considers the characteristics and life cycles of the following important algae, animal and plant groups: Chlorophyta, Phaeophyta, Rhodophyta, Chrysophyta, Euglenophyta, Pyrrophyta, Cryptophyta, Protostomate phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostomate phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chodrichthyes, Actinopterygii, Actinistia, Dipnoi, Amphibia, Reptilia, Aves, Mammalia) bryophytes, seedless vascular plants, gymnosperms, and the angiosperms. Concepts such as Homology and analogy; body symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered.

Examples from Namibia shall be used where possible and applicable. The course content shall be supplemented with appropriate weekly practical sessions in the laboratory and in the field.

(Although the above information has been compiled as accurately as possible, the Faculty of Agriculture and Natural Resources cannot be held responsible for any errors and/or omissions which may occur in the above module descriptors of modules offered by other Departments.)

K.2.2 SECOND YEAR MODULES

Module Title:	WILDLIFE ECOLOGY
Code	AWML 3632
NQF Level	6
Contact hours	lectures: 4 x 1hr/wk for 14 weeks (56hrs); practicals: 3 hr/week for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	none
Compulsory/elective	compulsory
Semester offered	1

Module Content:

Concept of ecology. Organism and its environment (adaptation, water and thermal balance, light, soil). Ecosystem ecology: energy flow, biomass, trophic levels, biogeochemical cycles. Major ecosystems of southern Africa, with special reference to Namibia. Community ecology: structure, stability, disturbance, diversity, patterns. Ecological succession. Properties of populations: distribution, densities, age and sex structure, mortality and natality, survival,

migration and immigration. Population regulation. Interspecific relationships: competition, predation, commensalism, amensalism, mutualism. Feeding niche. Life histories patters

Assessment strategies
Continuous assessment: 50% (at least 2 tests, practical assessments); Exam: 50% (1 x 3 hr paper).

Module Title:	WILDLIFE MANAGEMENT
Code	AWLM 3601
NQF Level	6
Contact hours	lectures: 2 x 1hr/wk for 14 weeks (28hrs); practicals: 1 x 2hr alternate for 14 weeks (14hrs)
NQF Credits	8
Prerequisite	none
Compulsory/elective	compulsory
Semester offered	1

Module Content:
An introduction to basic principles used in the management of wildlife populations, their habitats and their human users. General concepts in ecological processes; population dynamics and structure; life history patterns, biotic and abiotic factors structuring wildlife populations and endangered species. Response of wildlife to human. Plant-herbivore system. Herbivore-carnivore system. Predation of domestic animals and by domestic animals. Wildlife species and their characteristics: antelope and other smaller herbivores, large herbivores, predators, ostriches, combining wild and domestic herbivores. Game ranch planning: fences, water holes, roads. Wildlife management techniques. Harvesting, hunting and capturing wild animals. Handling and measuring trophies. Wildlife management and rural development.

Assessment strategies
Continuous assessment: 40% (at least three assessments); Exam: 60% (1 x 2 hr paper)

Module Title:	ECOTOURISM
Code	AWLM 3631
NQF Level	6
Contact hours	lectures: 4 x 1hr/wk for 14 weeks (56hrs); practicals: 3 hr/week for 14 weeks (42hrs)
NQF credits	16
Prerequisite	hghe3511: fundamentals of physical geography
Compulsory/elective	compulsory
Semester offered	1

Module Content:
Major goals of ecotourism; tourism and wildlife habituation; negative impact of wildlife tourism; field guiding practice; forms of ecotourism: angling, trophy-hunting, bird-watching, marine and coastline tourism, primitive camping; ecotourism internship; hospitality and ecotourism development.

Assessment strategies
Continuous assessment: 40% (at least three assessments, practical assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	SYSTEMATIC BOTANY
Code	AWLM 3651
NQF Level	6
Contact hours	lectures: 4 x 1hr/wk for 14 weeks (56hrs); practicals: 3 hr/week for 14 weeks (42hrs)
NQF credits	16
Prerequisite	none
Compulsory/elective	compulsory
Semester offered	1

Module Content:
Introduction to plant taxonomy. Plant anatomy and morphology. Taxonomic concepts, plant classification, nomenclature. Trees, shrubs, grass and herbs identification. Botanical keys: types and use. Specimen collection. Major plant families in southern Africa, with special reference to Namibia.

Assessment strategies
Continuous assessment: 50% (at least three tests, practical assessments); Exam: 50% (1 x 3 hr paper)

Module Title:	FRESHWATER ECOLOGY
Code	AWLM 3681
NQF Level	6
Contact Hours	Lectures: 3 X 1hr/Wk For 14 Weeks (42hrs); Practicals: 1 X 3hr Alternate For 14 Weeks (21hrs)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Abiotic parameters influencing productivity of aquatic ecosystems. Diversity, structure and functioning of various community structures: phytoplankton, zooplankton and benthos. Direct and indirect interactions between the biotic and abiotic components of the aquatic ecosystems. Intespecific relationships. Reproduction tactics, growth, survival and fecundity of producers and consumers. Aquatic ecosystems of Namibia and other SADAC countries. Management and conservation of aquatic habitats

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 3 hr paper)

Module Title:	ORNITHOLOGY
Code	AWLM 3682
NQF Level	6
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Ornithology as science. Anatomy and morphology. Eco-physiology. Distribution, demography and habitat selection. Territoriality versus coloniality. Avian communities. Reproductive biology and ecology. Breeding strategies (mating systems, brood parasitism, co-operative breeding). Feeding ecology. Biogeography. Migration. Bird conservation.

Assessment strategies
Continuous assessment: 40% (at least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	MAMMALOGY
Code	AWLM 3602
NQF Level	6
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Comparative anatomy and physiology. Distribution, numbers and habitat selection. Reproductive biology and ecology. Feeding ecology. Communication, orientation and echolocation. Life cycles. Climatic adaptations. Natural and human threats to habitats of mammal. Conservation strategies.

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	WILDLIFE NUTRITION
Code	AWLM 3622
NQF Level	6
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Anatomy and physiology of digestive system; digestion in herbivores; feeding ecology of wildlife species; diet composition and analysis; nutritional value of plants; plant chemicals and toxins; management of toxic plants and affected game; water quality and water requirements; mineral deficiencies and supplementary feeding; nutrition in captivity.

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	WILDLIFE DISEASE
Code	AWLM 3642
NQF Level	6
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
General principles. Recent advances of immunology. Viral, bacterial and protozoan diseases; ecto- and endoparasites (pathology, diagnosis, treatment and control). Epizootia and enzootia. Wildlife diseases investigation, preventive medicine. Physical and chemical restraint and anesthesia. Aspects of wildlife surgery.

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	ECOLOGY OF AFRICAN ECOSYSTEMS
Code	AWLS 3612
NQF Level	6
Contact Hours	Lectures: 4 X 1hr/Wk For 14 Weeks (56hrs); Practicals: 3 Hr/Week For 14 Weeks (42hrs)
NQF Credits	16
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Distribution of savanna biomes in Africa. Determinants of savanna structure and function: water, soil, nutrients, fire, herbivory. Vegetation of savanna: rich versus poor savanna. Energy flow and food web. Biodiversity of savanna. Tree-grass and predator-prey interactions. Competition and mutualistic relationships. Population models. Managing savanna. Distribution of desert and semidesert biomes in Africa. Determinants of desert and semidesert structure and function: water, soil, nutrients, herbivory. Animal adaptations to live in desert. Vegetation of desert and semidesert. Energy flow and food web. Biodiversity of desert and semidesert. Interspecific relationships. Population models. Managing desert and semidesert.

Assessment strategies
Continuous assessment: 40% (at least three assessments); Exam: 60% (1 x 3 hr paper)

Module Title:	GEO-INFORMATICS FOR WILDLIFE MANAGEMENT
Code	AWLM 3662
NQF Level	6
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	CLC3409: Computer Literacy; Hghe3511: Fundamentals Of Physical Geography
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content
Basic concepts, GIS data structures, processing and analysis techniques, basic cartography, map projections, introduction to GPS, basic aerial photograph interpretation. Use of GIS software. Use of GPS receiver. Display and manipulation of image files. Remote sensing for wildlife management, rangeland and vegetation monitoring.

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	BIOSTATISTICS
Code	ACRS 3681
NQF Level	7
Contact Hours	Lectures: 3x 1hr/Wk For 14 Weeks (42hrs); Practical's: 1 X 3hr Alternate Wk For 14 Weeks (21hrs)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Assessment Strategies
Continuous Assessment: 50% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 50% (1 x 2 hr paper).

Module Title:	ETHNOBOTANY
Code	AWLE 3602
NQF Level	7
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	AWLM 3651 SYSTEMATIC BOTANY
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Useful and toxic plants, their origin and history of plant use. Plant products and derivatives used in nutrition, medicine, building-construction, clothing. Potentials for new crop species. Utilization indigenous versus exotic plants.

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)

K.2.3 THIRD YEAR MODULES

Module Title:	GOVERNANCE OF WILDLIFE RESOURCES
Code	AWML 3701
NQF Level	7
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	Awlm 3601: : Wildlife Management;
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Philosophy and law; law and policies concerning regulation of commerce in wildlife; wildlife conservation and management within the legal and policy frameworks governing management of private, communal and state lands; regulation of human-wildlife interactions; tenure regimes and policy framework; constraints to wildlife conservations among resource-poor rural populations.

Assessment strategies:
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	WILDLIFE CONSERVATION
Code	AWLM 3781
NQF Level	7
Contact Hours	Lectures: 3 X 1hr/Wk For 14 Weeks (42hrs); Practicals: 1 X 3hr Alternate For 14 Weeks (21hrs)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Concepts of wildlife nature conservation. Values and ethics of wildlife conservation. Species conservation. Extinction and endangered species. Key and charismatic species. National and international forms of area protection for wildlife. Conservation strategies. In situ and ex situ wildlife conservation. Wildlife Conservation and sustainable development. Wildlife conservation in urbanized and agricultural ecosystems. The economics of wildlife conservation. National and international legislation on nature wildlife conservation

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 3 hr paper)

Module Title:	ECOLOGICAL METHODS IN WILDLIFE STUDIES
Code	AWLM 3721
NQF Level	7
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	Awlm3611: Wildlife Ecology
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Measuring species diversity, community similarities and niche width and overlap. Quantifying habitat selection. Determining diet composition, prey size and prey quality. Measuring the reproductive success. Determination of proximate causes of breeding failure. Measuring timing of reproduction and annual productivity. Methods of catching wildlife species: cage traps, nets, drugs; sexing, ageing, measuring and determining physical condition. Ringing and radio-tagging.

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	NATIONAL PARKS & GAME RESERVES
Code	AWLM 3741
NQF Level	7
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Co-Requisite	Awlm3781: Wildlife Conservation
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content
Role of national parks and game reserves. Principles of management in national parks and game reserves. A review of southern African national parks and game reserves, with special reference to Namibia.

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	ANIMAL BEHAVIOUR
Code	AWLM 3712
NQF Level	7
Contact Hours	Lectures: 3 X 1hr/Wk For 14 Weeks (42hrs); Practicals: 1 X 3hr Alternate For 14 Weeks (21hrs)
NQF Credits	16
Prerequisite	Awlm3682: Ornithology; Awlm3602: Mammalogy
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Simple and complex behaviour. Sign-stimuli, motivation. Conflict behaviour, orientation, learning, genes and behaviour. Anti-predator behavior. Instinct. Behavioural ecology. Feeding behaviour; Social and non-social behaviour; Aggression; Sexual behavior. Effects of environment on breeding. Ungulate and carnivore behavior.

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 3 hr paper)

Module Title:	GENETIC CONSERVATION
Code	AWLM 3702
NQF Level	7
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Co-Requisite	Awlm3781: Wildlife Conservation
Compulsory/Elective	Compulsory
Semester Offered	2

Module Cntent:
Introduction to genetic conservation. Genetics and extinction. Characterizing genetic diversity in single loci and by quantitative variation. Evolution in large population: natural selection and adaptation; mutation, migration and their interactions with selection. Evolution in small populations. Maintenance of genetic diversity. Effect of population size reduction: loss of genetic diversity in small populations, inbreeding depression, population fragmentation, genetically viable populations. Resolving taxonomic uncertainties and defining management units. Genetically modified food. Genetic management of wild and captive populations.

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	WILDLIFE SURVEY & MONITORING TECHNIQUES
Course Code	AWLM 3722
NQF Level	7
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
General principles of surveys and monitoring; the purpose of surveying and monitoring; an outline of basic techniques; Bird survey and monitoring techniques (census, atlas studies, territory mapping, line transects, point counts, mist netting, capture-mark-release-recapture, response to playback, timed species count, counting nests in colonies, leks, roosts and flocks, counting different groups of birds); mammal survey and monitoring techniques (census, atlas studies, mark-recapture methods, strip and line transects, counting dung, feeding signs, footprints, calls, breeding sites, hair tubes and hair catches, bat roosts, seal colonies; accuracy and precision of counts (sources of error and bias, environmental variables).

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	HABITAT MANAGEMENT
Code	AWLM 3742
NQF Level	7
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	Awlm3611: Wildlife Conservation; Awlm3601: Wildlife Management
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Habitat characteristic; habitat diversity, fragmentation, arrangement; changes to habitat (physical, biological, pollution); classification of plant communities; calculation plant biomass; assessing veld conditions; grazing management; bush encroachment; desertification; fire as ecological factor; determining carrying capacity (ecological, grazing and browsing); habitat enrichment and restoration

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	SYSTEMATICS OF BIRDS & MAMMALS
Code	AWLM 3732
NQF Level	7
Contact Hours	Lectures: 4 X 1hr/Wk For 14 Weeks (56hrs); Practicals: 3 Hr/Week For 14 Weeks (42hrs)
NQF Credits	16
Prerequisite	Awlm3682: Ornithology; Awlm3602: Mammalogy
Compulsory/Elective	Compulsory
Semester Offered	2

Module content
General taxonomy and nomenclature of birds and mammals. Phylogeny and origin of birds and mammals. Characteristic of avian and mammalian orders and families. Review of bird and mammals species, with special reference to southern African fauna: identification, biology and ecology of selected mammal species.

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 3 hr paper)

Module Title:	HERPETOLOGY & TERRARIUM
Code	AWLM 3782
NQF Level	7
Contact Hours	Lectures: 3 X 1hr/Wk For 14 Weeks (42hrs); Practicals: 1 X 3hr Alternate For 14 Weeks (21hrs)
NQF Credits	12
Prerequisite	Awlm3611: Wildlife Ecology
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Morphology and anatomy; ecophysiology; movements and orientation. Anuran vocal communication; communication and social behaviour. Mating systems and sexual selection. Reproduction and parental care. Life cycles. Snake bites. Phylogeny and origin of amphibians and reptiles. Characteristic of amphibian and reptile orders and families. Review of amphibian and reptile species, with special reference to southern African fauna: identification, biology and ecology of selected mammal species. Conservation of amphibians and reptiles. Terrarium: obtaining specimens, transporting and handling, enclosures, feeding, captive breeding.

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 3 hr paper)

Course Title:	RESERACH METHODS
Code	ACSC 3792
NQF Level	7
Contact Hours	Lectures: 3x1h For 14 Weeks (42 Hrs); Practicals: 1x3 Hr Alternate Wk For 14 Weeks (21 Hrs)
NQF Credits	12
Prerequisite	Acsc 3692: Biostatistics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Introduction/Review Of Basic Statistical Methods. Comparison Between Non-Parametric And Parametric Statistics. Non-Parametric Statistics: Goodness Of Fit Test, Test Of Association, Chi-Square Test, Paired Comparison, Wilcoxon's Test, Rank Correlation. Regression And Correlation. Multivariate Methods: Multiple Regression, Discriminant Analysis, Canonical Analysis, Multidimensional Scaling, Principal Component Analysis. Introduction To Statistical Computer Packages.

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 2 hr paper)

K.2.4 FOURTH YEAR MODULES

Module Title:	FRESHWATER ICHTHYOLOGY & AQUACULTURE
Code	AWLM 3801
NQF Level	8
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	Awlm3681: Freshwater Ecology
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Morphology, anatomy and physiology. Factors affecting fish distribution. Fish bahaviour. Feeding. Reproduction and growth. Migration and movements. Parasites and diseases. Traditional fishing, angling, subsistence fisheries, aquarium and ponds. Aquaculture: biological, engineering and economic factors involved in the establishment and operations of different freshwater aquaculture systems; systems and practices of aquaculture; impact of aquaculture on environment; nutrition, brood-stock management and larval.

Assessment strategies
Continuous assessment: 40% (at least two tests, practical assessments); Exam: 60% (1 x 2 hr paper)

Module Title:	ENTOMOLOGY
Code	AWLM 3811
NQF Level	8
Contact Hours	Lectures: 4 X 1hr/Wk For 14 Weeks (56hrs); Practicals: 3 Hr/Week For 14 Weeks (42hrs)
NQF Credits	16
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Morphology and functional anatomy of insects and arachnids. Movements and locomotion (gaint, jumping, swimming, burrowing, flying). Reproduction and metamorphosis. Camuflage and disruptive forms of illusion. Vocalisation: sound structure, sound function, sound structure). Insect constructions (tunnels, leaf mines, galls, paper and cotton nests, wax and silk, etc.). Insect migration. Insect societies (termites, ants, bees, wasps, etc.). Insect ecology. Role of insects and arachnids: agriculture, forestry, medicine, veterinary, food production. Pest control. Systematic of insects and arachnids, with special reference to Namibian fauna.

Assessment strategies
Continuous assessment: 50% (at least three tests, practical assessments); Exam: 50% (1 x 3 hr paper)

Module Title:	ECONOMIC OF WILDLIFE RESOURCES
Code	AWLM 3821
NQF Level	8
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	Awlm3601: Wildlife Management
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Typology of wildlife resources. Exploitation rates renewable resources, with emphasis on wildlife cropping. The concept of common property and free access resources. Wildlife on private and public lands. The economic of wildlife ranching. Wildlife species valuation in relation to tourists revenues; wildlife option values. Wildlife versus alternative land uses, e.g. agriculture, forestry and mining. Direct economic value of wildlife.

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	ENVIRONMENTAL IMPACT ANALYSIS
Code	AENE 3881
NQF Level	8
Contact Hours	Lectures: 3 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	12
Prerequisite	Awlm3611: Wildlife Ecology
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Definitions: impact assessment, environmental studies, environmental impact of human activities on natural resources. Impact on atmosphere, water bodies, vegetation and wildlife. Environmental considerations in physical planning. Impact identification, monitoring and mitigation. Methods of identifying impacts, monitoring environmental impacts, and types of mitigation actions. Formal Environmental Impact Assessment. Policy and framework in Namibia.

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	FIELD ATTACHMENT II
Code	ACA 3801
NQF Level	8
Contact Hours	6 Weeks
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Students will be attached to national parks, game reserves, conservancies and other wildlife agencies and tourist boards. An attachment report and oral presentation will constitute the total assessment mark.

Assessment strategies 50% report presentation at a seminar; 50% field report. Subject to satisfactory attendance and conduct during attachment.

Module Title:	ECOTOURISM MARKETING AND TRAVEL PAN DEVELOPMENT
Code	AWLM 3802
NQF Level	8
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Ecotourism marketing. Ecotourism Travel Pan Development. Ecotourism internship; impact of ecotourism on rural livelihood and poverty; enclave tourism and ecotourism.

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	WILDLIFE IN AGRICULTURAL ECOSYSTEMS
Code	AWLM 3822
NQF Level	8
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Pressures facing both farmers and wildlife in agricultural ecosystems; trade-offs between food production and wildlife conservation. Wildlife in agriculture ecosystems and rural sociology.

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	BIOGEOGRAPHY
Code	AWLM 3882
NQF Level	8
Contact Hours	Lectures: 3 X 1hr/Wk For 14 Weeks (42hrs); Practicals: 1 X 3hr Alternate For 14 Weeks (21hrs)
NQF Credits	12
Prerequisite	Awlm3662: Geo-Informatics For Wm
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Main concepts and rules of biogeography. Main biomes of the world, with special reference to Africa. Faunal regions and subregions of the world, with special reference to Africa. Dynamic biogeography. Geographical barriers and island biogeography. Climatic adaptations. Patterns of distributions.

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 3 hr paper)

Module Title:	DIGITAL WILDLIFE PHOTOGRAPHY
Code	AWLM 3841
NQF Level	8
Contact Hours	Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Equipment. Ethics and safety in wildlife photography. Flashing, shading and colouring. Macrophotography: insects, flowers. Underwater photography. Photography in zoological and botanical gardens. Composing pictures. Tonal ranges. Panoramic pictures. Focusing and scanning. Software picture preparations.

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	ENVIRONMENTAL & ECOTOURISM EDUCATION
Code	AENE 3842
NQF Level	8
Contact Hours	Lectures: 3 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
General principals of environmental education. Environmental awareness and ethics. Environmental educational institutions: nature history museums, zoological gardens, national parks, reserves. Methods of environmental education. Publicizing and advertizing environmental issues. Environmental education in primary and secondary schools. Environmental education in media.

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)

Module Title:	RESEARCH PROJECT
Code	AWLM 3810
NQF Level	8
Contact Hours	Individual Student Consultation For 28 Weeks: Equivalent To 1 Hr/Week
NQF Credits	16+16
Prerequisite	ACSC 3792: Research Methods
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Senior undergraduate students carry out independent study of a current topic in wildlife ecology. The course include participation in meetings organized by the coordinator, work with a faculty advisor to develop a research project, formulate hypothesis, design and carry out preliminary experiments and collect data and test the hypotheses. Students will carry out independent literature research, begin experimental work, prepare a written report and make a presentation to other students the proposal and final report. The student will submit a final report written following the Guide for Scientific Writing.

Assessment strategies
Continuous assessment: 100% (research proposal write up and presentation of proposal in a seminar, presentation of empirical findings in a second seminar, and grading of the final report).

L. BACHELOR OF VETERINARY MEDICINE (17BVET) – Six-year Programme

L.1 CRITERIA FOR ADMISSION

The minimum admission requirements into the Bachelor of Veterinary Medicine programme are as follows:
L.1.1 A Namibian Senior Secondary Certificate (NSSC) at NSSC-O (ordinary) or NSSC-H (higher level) with a minimum of 30 points in five subjects on the UNAM Evaluation Scale; or a recognized equivalent qualification.

In addition to the above, the following subjects and grades will be required:

i) English with a minimum B symbol or better at NSSC Ordinary Level, or a score of 3 or better at NSSC Higher Level.
ii) Biology (or Life Science) with a minimum B symbol or better at NSSC Ordinary Level, or a score of 3 or better at NSSC Higher Level.
iii) Mathematics with a minimum B symbol or better at NSSC Ordinary Level, or score of 3 or better on NSSC Higher level.
iv) Physical Science or Chemistry with a minimum B symbol or better at NSSC Ordinary Level, or a score of 3 or better at NSSC Higher Level.
v) Students with a score of C in English at NSSC Ordinary level and a minimum of 32 points on the UNAM Evaluation Scale will also be considered. Such students will be required to register for Communication and Study Skills.

(LCE3419) during the first semester of their first year of study.

L.1.2 Candidates with a three-year Diploma in Animal Health or Higher Diploma in Agriculture or related field with a combined average pass of 70% or higher from a recognized and accredited institution may also be granted admission to the Bachelor of Veterinary Medicine degree programme at the discretion of the Faculty of Agriculture and Natural Resources (FANR).

L.1.3 Candidates may also be admitted into the BVM programme through Mature Age provision if they meet the following conditions:
i) They should be at least 25 years old on the first day of the academic year in which admission is sought;
ii) They should have passed senior secondary school education;
iii) They should have proof of at least five years veterinary relevant work experience;
iv) They should pass all papers of the prescribed Mature Age Entry tests with a minimum of 60%.

L.1.4 Candidates who have successfully completed the entire first year of the BSc curriculum may also be admitted into the first year of the BVM programme if they have passed all basic science modules (i.e. Biology, Mathematics, Physical Science and Chemistry) with a minimum score of 60% in each of these modules. These students will be exempted from those first year modules already passed.
Meeting the minimum admission requirements does not necessarily ensure admission. Admission is based on the number of places available and is awarded on the basis at merit after a rigorous selection process. The Faculty reserves the right to interview candidates before admission.

L.2 ARTICULATION OPTIONS

This qualification will serve as an entry point to the MSc degree in Animal Science which is a related qualification.

L.3 MODE OF DELIVERY AND LOCATION

The Bachelor of Veterinary Medicine is a fulltime programme predominantly offered at the Neudamm Campus.

L.4 DURATION OF STUDY

The programme shall be completed in a minimum period of six (6) years and a maximum period of eight (8) years.

L.5 MINIMUM REQUIREMENTS FOR RE-ADMISSION

L.5.1 A student will not be re-admitted into the BVM programme if she/he has not passed at least:
104 credits by the end of the 1st year
208 credits by the end of the 2nd year
320 credits at the end of the 3rd year
392 credits at the end of the 4th year
488 credits at the end of the 5th year
584 credits at the end of the 6th year
682 credits at the end of the 7th year

L.5.2 Students who are not re-admitted into the BVM programme, may apply for transfer into other programmes in the Faculty of Agriculture and Natural Resources, provided that they meet the following minimum requirements for re-admission into the Faculty.

L.5.3 A student will not be re-admitted into the faculty if she/he has not passed at least:
48 credits by the end of the 1st year of which 16 must be non-UNAM core
120 credits by the end of the 2nd year
224 credits at the end of the 3rd year
328 credits at the end of the 4th year
432 credits at the end of the 5th year

L.6 ADVANCEMENT AND PROGRESSION RULES

L.6.1 To advance to the second year of the BVM programme a student must have passed at least 128 credits.
A student who has passed at least 104 (but less than 128) first year credits, will be allowed to register for a maximum of 48 second year credits (in addition to the failed modules) provided that the relevant pre-requisites have been passed.

L.6.2 To advance to the third year of the BVM programme a student must have passed all first year modules as well as at least 128 second year credits.
A student who has passed all first year modules and at least 64 (but less than 128) second year credits, will be allowed to register for a maximum of 48 third year credits (in addition to the failed modules) provided that the relevant pre-requisites have been passed.

L.6.3 To advance to the fourth year of the BVM programme a student must have passed all first, second and third year modules.
A student who did not pass all first and second year modules and / or passed less than 120 third year credits, will have to repeat all failed modules and will not be allowed to enroll for any fourth year modules.
If a student has passed all first and second year modules as well as at least 120 third year credits, such a student will be allowed to enroll for a maximum of 48 fourth year credits (in addition to the failed modules), excluding all clinical studies modules, provided that the relevant pre-requisites have been passed.

L.6.4 To advance to the fifth year of the BVM programme a student must have passed all first, second, third and fourth year modules.
A student who did not pass all first, second and third year modules and / or passed less than 102 fourth year credits, will have to repeat all failed modules and will not be allowed to enroll for any fifth year modules.
If a student has passed all first, second and third year modules as well as at least 102 fourth year credits, such a student will be allowed to enroll for a maximum of 20 fifth year credits (in addition to the failed modules), excluding clinical studies modules, provided that the relevant pre-requisites have been passed.

L.6.5 To advance to the final year of the BVM programme a student must have passed all first, second, third, fourth and fifth year modules. A student will not be allowed to carry any modules over to the sixth year of study as this involves clinical rotations.

L.6.6 A student will not be allowed to repeat the sixth year of study more than once.

No student will be allowed to register for a module for which the approved pre-requisite was not met.

L.7 MAXIMUM NUMBER OF CREDITS PER YEAR

A student will not be allowed to register for more than the following maximum credits per academic year:
Year 1: 152 credits
Year 2: 148 credits
Year 3: 152 credits
Year 4: 152 credits
Year 5: 162 credits
Year 6: 140 credits

L.8 REQUIREMENTS FOR QUALIFICATION AWARD

This qualification will be awarded to candidates credited with a minimum of 796 credits and who have met all the requirements of the curriculum.

L.9 PROGRAMME SCHEDULE

YEAR 1 (152 CREDITS)
Semester 1

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
PHY 3501	Physics for Life Science	5	02/28	21	8		
LEA 3519	English for Academic Purposes	5	04/56		16		
CSI 3580	Contemporary Social Issues	5	02/28		8		
BLG3511	Introduction to Biology	5	04/56	42	16		
MAT3511	Basic Mathematics	5	04/56	28	16		
BVB 3511	Veterinary Anatomy, Histology and Embryology	5	07/98		16		
Total Semester 1 credits: 76					76		

Semester 2

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3552	Veterinary Physiology I	5	04/56	42	16		
BVB 3512	Veterinary Anatomy	5	07/98		16		
BVB 3502	Veterinary Histology and Embryology	5	05/70		8		
CLC 3509	Computer Literacy	5	02/28		8		
BVB 3532	Veterinary Biochemistry	5	04/56	21	16		
BVM 3542	Veterinary Genetics	5	02/28	21	8		
Total Semester 2 credits: 76					76		

YEAR 2 (148 CREDITS)
Semester 1

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3601	Animal Ethology and Welfare	6	04/56	21	8		
BVC 3611	Veterinary Microbiology	6	02/28	21	16	BLG 3511	
BVM 3671	Applied Companion Animal Anatomy I	6	07/98		16	BVB 3511, BVB 3512, BVB 3502	
BVM 3611	Veterinary Physiology II	6	04/56	42	16	BVM 3552	
BVM 3651	Veterinary Parasitology I	6	04/56	42	16	BLG 3511	
Total Semester 1 credits: 72					72		

Semester 2

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3602	Veterinary Immunology and Vaccinology	6	02/28	21	8		BVM 3611
BVM 3672	Applied Production Animal Anatomy	6	7/98		16	BVB 3511, BVB 3512, BVB 3502	
BVM 3652	Veterinary Parasitology II	6	04/56	42	16	BLG 3511	
BVM 3612	Animal Nutrition and Pasture Science	6	04/56	21	16	BVM 3611, BVB 3532	
BVM 3622	Animal Production	6	02/28	21	8		
BVM 3642	Biometry	6	02/28	14	8	MAT 3511	
BVM 3609	Field Practical Training I: Laboratory	6	1 week		4		
Total Semester 2 credits: 76					76		

YEAR 3 (152 CREDITS)

Semester 1

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3760	General Surgery, Anaesthesiology and Diagnostic Imaging	7	02/28	21	8	BVM 3611, BVB 3511, BVB 3502, BVB 3512,BVM3552	BVM3700
BVM 3721	Herd Health Management and Economics I	7	02/28	21	8	BVB 3651, BVM 3622, BVM 3602	
BVM 3711	Infectious Diseases I	7	04/56	42	16	BVM 3611	
BVM 3700	Veterinary Pharmacology	7	02/56	21	8	BVM 3651, BVM 3652, BVM 3611 BVB 3512	
BVM 3740	Veterinary Toxicology	7	02/56	21	8	BVM 3611 BVB 3532	BVM3720
BVM 3781	Ethno-Veterinary Medicine	7	02/14		4		
BVM 3731	Veterinary Epidemiology I	7	04/56		16	BVM 3642	BVM 3711
BVM 3720	General Pathology	7	02/56	21	8	BVM 3652,	
Total Semester 1 credits: 76					76		

Semester 2

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3760	General Surgery, Anaesthesiology & Diagnostic Imaging	7	02/28	21	8	BVM 3611, BVB 3511,BVM3552, BVB 3502, BVB 3512	BVM3700
BVM 3722	Herd Health management and Economics II	7	02/28	21	8	BVB 3651, BVM 3622, BVM 3602	
BVM 3720	General Pathology	7	02/56	21	8	BVB 3511, BVB 3512, BVB 3502 BVM 3651, BVM3602, BVC BVM 3652 3611	
BVM 3700	Veterinary Pharmacology	7	02/56	21	8	BVM 3651, BVM 3652, BVM 3611 BVB 3512	BVM3731
BVM 3740	Veterinary Toxicology	7	02/28	21	8	BVM 3651, BVM 3652, BVM 3611 BVB 3512	BVM3720 BVM3700
BVM 3712	Infectious Diseases II	7	04/56	21	16	BVM 3601	BVM 3711
BVM 3732	Veterinary Epidemiology II	7	02/28	21	8	BVM 3642	BVM3712, BVM3731
BVC 3702	Fish and Bee Medicine	7	02/28	21	8	BVM 3642	
BVM 3709	Field Practical Training II: Game Reserve	7	1 week		4		
Total Semester 2 credits:					76		

YEAR 4 (152 CREDITS)

Semester 1

MODULE CODE	MODULE TITLE	NQF L	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3821	Clinical Pathology	8	02/28	21	8		
BVM 3800	Systemic Pathology	8	02/28	21	8	BVM 3720	
BVC 3801	Wildlife Clinical Studies I	8	05/70		8	BVM 3709	
BVM 3811	Veterinary Public Health I	8	04/56	21	16	BVM 3651, BVM 3652 BVM3720 BVM 3711, BVM 3712	
BVC 3831	Production Animal Clinical Studies I	8	07/98		16	BVM 3670, BVM3711,BVM3712, BVM3731,BVM3740	BVC 3832
BVC 3811	Companion Animal Clinical Studies I	8	07/98		16	BVC3611,BVM3602, BVM3652,BVM3700, BVM3740	BVC 3812 BVM 3821
Total Semester 1 credits: 72					72		

Semester 2

MODULE CODE	MODULE TITLE	NQF	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3812	Veterinary Public Health II	8	04/56	21	16	BVM 3752, BVM 3651, BVM 3652 BVM 3711, BVM 3712	BVM 3811
BVC 3812	Companion Animal Clinical Studies II	8	7/98		16	BVC3611,BVM 3602, BVM3652,BVM3700, BVM3740	BVC 3811
BVC 3802	Wildlife Clinical studies II	8	05/70		8	BVM 3701, BVM 3702	BVC 3801
BVM 3800	Systemic Patholog	8	02/28	21	8	BVM 3720	
BVC 3832	Production Animal Clinical Studies II	8	07/98		16	BVM 3670, BVM 3711,BVM3712, BVM3731,BVM3740	BVC 3831
BVM 3882	Research methodology	8			8	BVM3731, BVM3732	
BVM 3809	Field Practical Training III: Private and State Vet Clinic	8	10 days		4		
Total Semester 2 credits: 80					80		

YEAR 5 (162 CREDITS)

Semester 1

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVC 3851	Companion Animal Clinical Studies III	8	7/98		16	BVM 3821 BVC 3811 BVC 3812	BVC 3852
BVC 3871	Production Animal Clinical Studies III	8	7/98		16	BVC 3831, BVC 3832	BVC 3872
BVE 3800	Equine Clinical Studies	8	5/70		8	BVM 3701	
BVM 3871	Theriogenology I	8	7/98		16		BVM 3832
BVM 3880	Veterinary professional skills	8	2/56		4		
BVM 3861	Wildlife Clinical Studies III	8	05/70		8	BVC 3801, BVC 3802	
BVC 3880	Research Project	8	03/42			BVM 3882	
Total Semester 1 credits:					76		

Semester 2

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3822	Policy, Legislation and Jurisprudence	8	05/70		8		
BVC 3872	Production Animal Clinical Studies IV	8	7/98		16	BVC 3831,BVC 3832	BVC3871
BVC 3852	Companion Animal Clinical Studies IV	8	7/98		16	BVM3821 BVC3811 BVC3	BVC3851
BVM 3832	Theriogenology II	8	5/70		8		BVM 3871
BVE 3800	Equine clinical studies	8	5/70		8		
BVM 3880	Veterinary Professional skills	8	2/56		4		
BVC 3880	Research Project	8	03/42		30	BVM 3822	
TOTAL Semester 2 credits:						90	

YEAR 6 (140 CREDITS)

Semesters 1 & 2

MODULE CODE	MODULE TITLE	NQF LEVEL	Weeks	Credits	PRE-REQUISITES
BVC 3890	CLINICAL ROTATION	8	37	140	BVM V
Compulsory:	Small Animal Medicine, Small Animal Surgery, Equine medicine, Equine surgery,Anaesthesiology, diagnostic imaging, Outpatients, Pathology (UP)		12	40	
	Research Seminar		1	4	
	Production Animal Clinical Studies Neudamm Farm: vaccination, dehorn, castrate, including dairy and beef HH		2	8	
	Production Animal Clinical Studies Ambulatory clinic		1	4	
	Production Animal Clinical Studies Skills lab/wet lab		1	4	
	Theriogenology		2	8	
	Veterinary Public Health		2	8	
	Companion Animal Clinical Studies Mobile Clinic		1	4	
	Companion Animal Clinical Studies skills lab/wet lab		1	4	
	Companion Animal Clinical Studies surgery/anaesthetics		1	4	
	State Veterinary Practice		2	8	
	State Veterinary office: import-export permits/ traceability/epidemiology		1	4	
	Private Veterinary Practice		2	8	
Elective:	Exotic animals, Fish and Bee Medicine, Wildlife capture, Community veterinary clinic, Equine, Veterinary Laboratory, Nutrition, Semen freezing, Pigs, Poultry, own choice (selected from above compulsory module list)		3	12	
Total Semester 2 credits: 140				140	

The Sixth year of this programme will entail an intensive clinical rotation for 32 weeks, where each student will be exposed to various rotations under supervision of trained registered professional veterinarians and other experts in their fields to develop their practical skills and attain their "Day One Competencies" as recommended by the OIE and NVC.

Assessment Strategies:

Continuous assessment (for examination entrance):

1. Submission of completed clinical skills logbook.
2. Marking rubrics designed for each rotation (subminimum for each rotation 50%).

Examination: 4 theory papers:
1. Companion Animal Clinical Studies
2. Production Animal Clinical Studies
3. VPH and Pathology
4. Epidemiology and Regulatory Medicine

Examination: 3 practical exams:
1. Companion Animal,
2. Production Animal, and,
3. Veterinary Public Health and Pathology.

Subminimum for each paper, theory and practical: 40%.

Exam mark: 50% for theory papers; 50% for practical papers
Final mark: 50% Continuous assessment (logbook plus clinical rotations) and 50% Exam mark
Pass mark: 50%
TOTAL PROGRAMME CREDITS: 906

L.10 MODULE DESCRIPTORS

L.10.1 FIRST YEAR MODULES

PHY 3501 PHYSICS FOR LIFE SCIENCES

Module Title:	PHYSICS FOR LIFE SCIENCES
Code:	PHY 3501
NQF Level:	5
Contact hours:	Lectures: 2 x 1hr lectures / week for 14 weeks (28 hrs) Practicals: 1 x 3hr practical / alternate week for 14 weeks (21hrs)
NQF Credits:	8
Pre-requisites:	None
Co-requisite:	None
Compulsory/Elective:	Compulsory
Semester Offered:	1

Module Content:
Physics and Measurement: units and unit conversion, SI-unit system and non-metric systems, significant figures and scientific notation.
Vectors: vectors and scalars, operations with vectors in two dimensions, component method of vector operations
Motion 1 and 2 Dimensions: average velocity; acceleration; motion at constant acceleration; freely falling bodies; Projectiles; uniform circular motion
Newton's Laws of Motion: force and weight, Newton's first, second and third laws, applications of Newton's laws, free-body diagrams, friction, motion on inclined planes; centripetal force, banking of curves.
Gravitation: Newton's law of universal gravitation; gravity near the Earth's surface, satellites; Kepler's first, second and third laws.
Work, Energy and Power: work done by a constant force, kinetic energy, work-energy theorem, potential energy, conservation of mechanical energy, power.
Momentum: conservation of momentum; collisions in one dimension; impulse; conservation of energy and momentum in collisions; elastic and inelastic collisions in one dimension.

Assessment Strategies
Continuous assessment (tests, practicals and assignments): 50%.
Written examination (1 x 2-hour paper): 50%
Minimum mark to pass the module: 50%
The tests and examination will cover the module content.

This is an introductory biology Course that is designed to allow students to acquire a strong foundation into the biological sciences. The following topics will be covered: Basic techniques in biology such as microscopy, drawing, the scientific method and writing of scientific reports will be covered; Introduction to systems of classification (taxonomy and binomial nomenclature, including the five kingdoms and the three domain system); Organization of life (levels of organization): Molecule, organelle, cell, tissue, organ, organ system, organism, population, community, ecosystem (including the scales in ecology), biosphere; Chemical basis of life: carbohydrates, proteins, nucleic acids, lipids and fats, water; Cell biology: prokaryotic and eukaryotic cells, ultra-structure of plant and animal cells, cytoskeleton, membrane structure and function, cell cycle, cell division; Genes, chromosomes, genomes, Mendelian genetics, extensions to Mendelian genetics, chromosome theory of inheritance; Early theories on evolution, Evolution by natural selection (microevolution vs macroevolution), phylogeny and evolutionary relationships in five kingdoms. (Concepts such as homology and analogy; body symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered)

Emphasis will be focused on the following topics:
Cell structure
Chemistry of Life – Atoms, Interactions between atoms, chemical bonding
Water and the Biological System – Properties of water, water in biochemical reactions, acids, bases and salts
Carbon molecular diversity and organic molecules – carbon, lipids, amino acids & proteins, nucleotides & nucleic acids
Membrane structure and function – interactions with the environment, diffusion &
osmosis Introduction to cell communication – 3 stages of cell signalling & transduction
Concepts of early development of organisms & evolution–development of body structure, body cavities, principles of evolution, evidence for sources of variations
Mitosis and meiosis – structures of chromosomes, cell cycle, process of meiosis, meiosis and genetic variation
Introduction to Mendelian Genetics – Mendel's Laws, chromosomes and inheritance, Mendelian inheritance in humans, chromosomal differences

Assessment Strategies
Continuous assessment 40% (60 % - minimum of 2 tests and 40% - at least 10 graded practical-reports)
Examination: 60% (1 x 3 hour examination paper)

MAT 3511 BASIC MATHEMATICS

Module Title:	BASIC MATHEMATICS
Code:	MAT 3511
NQF Level:	5
Contact hours:	Lectures: 4 x 1hr / week for 14 weeks (56 hrs) Tutorials: 1 x 2hr / week for 14 weeks (28hrs)
NQF Credits:	16
Pre-requisites:	NSSC Mathematics
Co-requisite:	None
Compulsory/Elective:	Compulsory
Semester Offered:	1

Module Contents:
The module will cover the following chapters:
Sets: What is a set? Set notation, equality of sets, subsets, characterization of equality via the subset relation, empty set, power sets, Venn diagrams, intersection, union, complement, de Morgan's laws, set difference, symmetric difference, proofs of simple results on set equality.
Standard examples of sets: natural numbers, integers, rationals, real numbers, absolute value, intervals in R and a bit about cardinality of sets (examples of finite, infinite, countable, uncountable sets).
Algebraic expressions: Simplification, expansion, factorization, polynomials, remainder and factor theorem, quadratic polynomial, binomial expansions, Pascal's triangle and the Binomial Theorem. Rational expressions, partial fractions will also be discussed.
Equations and inequalities: Linear equations in one-variable, simultaneous linear equations, quadratic equations, simultaneous non-linear equations, Linear inequalities, non-linear inequalities.
Trigonometry: Trigonometric ratios, angle orientation in the xy-plane, graphs of trigonometric functions, trigonometric identities, justifying (proving) equality of relatively simple trigonometric expression, sum/difference, double angle, half angle and sum to product formulas.
Sequences: Definition, notation, obtaining the general term in sequences, arithmetic sequences, geometric sequences, and recursively defined sequences.

Assessment Strategies
Course Assessment: Continuous Assessment: 50% (minimum of 3 class tests).
Examination: 50% (1 x 3-hour paper).

BVB 3511 VETERINARY ANATOMY, HISTOLOGY AND EMBRYOLOGY

Module Title: VETERINARY ANATOMY, HISTOLOGY AND EMBRYOLOGY
Code: BVB 3501
NQF Level: 5
Contact Hours: 7 hrs of integrated theory and practicals / week each semester
NQF Credits: 16
Pre-requisites: None
Co-requisite: None
Compulsory / Elective: Compulsory
Semester Offered: 1

Module Aims:
This module aims to provide a fundamental overview of the structural and functional anatomy of the canine as a basis for understanding the anatomy of domestic animals commonly encountered in veterinary medicine. Emphasis is placed on gross, basic and early developmental anatomy, as well as histology of the basic vertebrate tissues of the animal body and the associated medical terminology using one of the following as the model animal (canine, bovine, ovine, equine, porcine, caprine). Topics: Osteology, Arthrology; myology of the musculo-skeletal system, microscopic (histological) and early embryonic development up to gastrulation and placentation.
Module Content:
The module will focus on general introductory macroscopic (gross), anatomy of the skeletal system of the model animal. Basic and early developmental anatomy, as well as histology of the basic vertebrate tissues will be completed.

Assessment Strategies:
Continuous Assessment: Minimum 2 assessments and at least 5 marked practical assessments
Examination: 1 x 2hr practical (50%) and 1 x 3hr theory paper (50%)

BVM 3552 VETERINARY PHYSIOLOGY I

Module Title: VETERINARY PHYSIOLOGY I
Code: BVM 3552
NQF Level: 5
Contact Hours: Lectures: 4 x 1hr / week each semester
Practicals: 1 x 3hr practical / week each semester
NQF Credits: 16
Pre-requisites: None
Co-requisite: None
Compulsory / Elective: Compulsory
Semester Offered: 2

Module Content:
The module will cover the following topics:
General introduction - organ systems: overview and integration, concept of feedback loop and Homeostasis and body system integration; physiology of nervous system and muscle – Organization, structures and functions of the nervous system, the central and peripheral nervous systems, the autonomic nervous system, somatic nervous system, neurophysiology, the somatosensory system: olfaction, taste, hearing and Equilibrium, vision; Physiology of movement: muscles, types of muscles, sliding filament theory of muscle contraction, excitation-contraction coupling, locomotion and movement coordination; physiology of the endocrine system, endocrine glands functions of the endocrine system, systemic effects of main hormones, the renin-angiotensin-system; endocrine versus nervous system regulation; reproductive system: genital glands, oestrus cycle, mammary gland; physiology of cardiovascular system; overview of cardiovascular function; blood: composition, properties and function of blood, blood circulation, physiology of lymph, medullar and synovial liquids, cardiac muscle, mechanism of cardiac contraction, heart beat and cardiac cycle, regulation of blood pressure and heart activity.

Assessment Strategies:
Continuous Assessment: minimum 3 assessments and at least 5 marked practical assessments
Examination: 1 x 3hr paper

BVB 3512 VETERINARY ANATOMY

Module Title: VETERINARY ANATOMY
Code: BVB 3512
NQF Level: 5
Contact Hours: 7 hours of integrated theory and practicals/ week each semester
NQF Credits: 16

Pre-requisites: None
Compulsory / Elective: Compulsory
Semester Offered: 2

Module Content:
The module will focus on general (introductory) and systemic macroscopic (gross), anatomy of the muscular, digestive, cardiopulmonary, urogenital (urinary and reproductive) nervous, haemopoietic, lymphoreticular, endocrine and integumentary systems as well as sensory organs of the model animal species. The gross anatomical, aspects of these systems will be covered using a regional approach for each topic.

Assessment Strategies:
Continuous assessment: Minimum 2 theory assessments and at least 7 marked practical assessments
Examination: 1 x 2hr practical examination (50%) and 1 x 3hr theory paper (50%).

BVB 3502 VETERINARY HISTOLOGY AND EMBRYOLOGY

Module Title: VETERINARY HISTOLOGY AND EMBRYOLOGY
Code: BVB 3502
NQF Level: 5
Contact Hours: 5 hours of integrated theory and practicals/ week each semester
NQF Credits: 8
Pre-requisites: None
Compulsory / Elective: Compulsory
Semester Offered: 2

Module Content:
The module will focus on general microscopic and developmental organonolgy of the, digestive, cardiopulmonary, urogenital (urinary and reproductive) nervous, haemopoietic, lymphoreticular, endocrine and integumentary systems as well as sensory organs of the domestic animals with some other relevant vertebrate examples

Assessment Strategies:
Continuous assessment: Minimum 2 theory assessments and at least 7 marked practical assessments
Examination: 1 x 2hr practical examination (50%) and 1 x 2hr theory paper (50%).

CLC 3509 COMPUTER LITERACY

Module Title: COMPUTER LITERACY
Code: CLC 3509
NQF Level: 5
Contact hours: Lectures: 1 x 2hr / week for 14 weeks (28 hrs)
NQF Credits: 8
Pre-requisites: None
Co-requisite: None
Compulsory/Elective: Compulsory
Semester Offered: 2

Module Contents:
The module covers the following topics.
Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system; File Management, working with multiple programs, and using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge. Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the work book. Databases: creating tables, relationships, queries, forms and reports.
Presentation software: slide layout and master, animations, auto-content wizard and templates.
Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

Assessment Strategies
Continuous Assessment: minimum 2 tests, 2 assignments, and practical reports (40%),
Examination consisting of a 2-hour paper (60%).

BVB 3532 VETERINARY BIOCHEMISTRY

Module Title:
Code:
NQF Level:
Contact Hours:

NQF Credits:
Pre-requisites:
Co-requisite:
Compulsory / Elective:
Semester Offered:

Module Content:

The module will focus on the following topics:

Enzymology: Enzymes as organic catalysts; enzyme nomenclature; factors affecting activities of enzymes; enzyme kinetics - the Michaelis-Menten equation; the Line weaver-Burk plot; enzyme inhibition; allosterism.

Bioenergetics and thermodynamics: free energy, laws of energy, activation energy, transition states, endergonic and exergonic reactions.

Metabolism: Catabolism and anabolism: carbohydrate catabolism (glycolysis, alcohol and metabolism of lactic acid, tricarboxylic acid cycle or the TCA cycle; electron transport chain and oxidative phosphorylation); regulation of carbohydrate metabolism; gluconeogenesis; synthesis of the disaccharides (lactose and sucrose); synthesis of polysaccharides (starch and glycogen); lipid metabolism (β-oxidation, malonly CoA); integration of carbohydrate and fat metabolism; amino acids and protein metabolism; urea cycle; the Cori cycle; pentose phosphate pathway. Metabolic diseases especially those related to the digestion in ruminants will also be discussed.

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 5 practical assessments
Examination: 1 x 3hr

BVM 3542 VETERINARY GENETICS

Module Title:	VETERINARY GENETICS
Code:	BVM 3542
NQF Level:	5
Contact Hours:	Lectures: 2 x 1hr / week for 14 weeks (28 hrs) Practicals: 1 x 3hr / alternate week for 14 weeks (21hrs)
NQF Credits:	8
Pre-requisites:	None
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:

This module introduces and presents principles and methods used in the study of veterinary genetics. The emphasis throughout is on application of concepts to solve problems. It covers the creation and use of genome assemblies and genetic maps; single-locus traits and disorders; chromosomal abnormalities; non-Mendelian familial disorders; immune-genetics; parentage tests; conservation genetics; Genetic basis of resistance to diseases; genetic and environmental control of inherited diseases; relationship and inbreeding; heritability; breed history and structure; selection and crossing; genetics of coat colours; genetic biotechnology; clinical genetics; applied population genetics, introduction to advanced genetic techniques in applied genetics.

Assessment Strategies:

Continuous Assessment: minimum 2 theory assessments and at least 3 marked practical assessment
Examination: 1 x 2 hr paper

L**.10.2 SECOND YEAR MODULES**

BVM 3621 ANIMAL ETHOLOGY and WELFARE

Module Title:	ANIMAL ETHOLOGY and WELFARE
Code:	BVM 3621
NQF Level:	6
Contact hours:	Lectures: 2 x 1hr / week Practicals: 1 x 3hr / altenate week
NQF Credits:	8
Pre-requisites:	None
Co-requisite:	None

Compulsory/Elective: Compulsory
Semester Offered: 1

Module Contents:
Animal Ethology: The module deals with the behavioural adaptations of domestic animals to their environment as well as appropriate animal restraining and handling practises. The module will cover a brief history of the study of animal ethology, the interpretation of animal behaviour, and the major types of behaviour in domestic animals.

Animal Welfare: The module covers different aspects of animal welfare science with reference to the Five Freedoms and OIE animal welfare recommendations. The behavioural factors that affect the welfare of animal will be highlighted. Animal husbandry issues such as housing, handling, and basic aspects of nutrition of animals will be discussed, with relevance to their impact on the welfare of animals. The module will also focus on the introduction to animal welfare ethics, influence of transport and the marketplace on animal welfare, ethics and principles of euthanasia. The current relevant Namibian animal protection and welfare legislation and the role of the welfare organisations will be assessed and evaluated. The module will further highlight the role veterinarians play in delivering services that enhance the welfare of animals.
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Assessment Strategies
Continuous Assessment: minimum 3 theory assessments and at least 3 marked practical assessments
Examination: 1 x 2hr paper

BVC 3611 VETERINARY MICROBIOLOGY

Module Title:	VETERINARY MICROBIOLOGY
Code:	BVC 3611
NQF Level:	6
Contact Hours:	Lectures: 4 x 1hr / week Practicals: 1 x 3hr / alternate week each
NQF Credits:	16
Pre-requisites:	BLG 3511
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
The module will cover the following:
General microbiology and bacteriology: Introduction and history of microbiology, morphology, structure, growth and nutrition of bacteria, classification and nomenclature of bacteria, microbial ecology, control of microorganisms, pathogenicity, virulence and infection; endotoxins and exotoxins; bacterial genetics, plasmids and antibiotic resistance.
Mycology: Introduction, morphology, growth, nutrition, reproduction in fungi, classification of fungi.
Virology: Introduction to viruses, general properties, replication, cultivation and purification of viruses, cell-virus interactions, viral genetics and interferon.
Diagnostic microbiology: Equipment, sterilization, disinfection and asepsis, staining, bacterial motility, preparation of culture media, aerobic and anaerobic cultivation, isolation of bacteria in pure culture, morphological and cultural characteristics, biochemical characteristics, antibiogram and slide culture technique for fungus.

Assessment Strategies:
Continuous Assessment: minimum 2 theory assessments and at least 5 marked practical assessments
Examination: 1 x 3 hr paper

BVM 3631 APPLIED COMPANION ANIMAL ANATOMY

Module Title:	APPLIED COMPANION ANIMAL ANATOMY
Code:	BVM 3631
NQF Level:	6
Contact Hours:	7 hours of integrated theory and practicals/ week each semester
NQF Credits:	16
Pre-requisites:	BVB 3511, BVB 3512, BVB 3502
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:

The module will focus on applied (clinical and topographic) of companion animals. Topics to be covered include: topographic anatomy of the head, neck, forelimb, hindlimb, thorax, abdomen and pelvis and perineum in dogs and horses. Knowledge gained in topographic anatomy of companion animals will be flagged as a basis for understanding subsequent veterinary medical studies such as pathology, local anaesthesia, medical imagery, surgery, therapeutics and clinical diagnostics of these species.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 2 practical assessments
Examination: 1 x 2hr practical examination (50%) and 1 x 3hr paper (50%)

BVM 3611 VETERINARY PHYSIOLOGY II

Module Title:	VETERINARY PHYSIOLOGY II
Code:	BVM 3611
NQF Level:	6
Contact Hours:	Lectures: 4 x 1hr / week each semester Practicals: 1 x 3hr / week each semester
NQF Credits:	16
Pre-requisites:	BVM 3552 (Veterinary Physiology I)
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
The following specific topics will be covered:
Physiology of digestive system: review of gastrointestinal tract (GIT), main functions of digestive system, accessory digestive organs and glands, digestive phenomenon of monogastric and polygastric animals; regulation of the gastrointestinal tract functions, poultry digestive system;
Physiology of the respiratory system: organizational structure and functions, review of gas Law, breathing mechanisms, ventilation, gases exchange in the lung and in the tissue, respiratory volumes and capacities, respiratory sounds, control of respiration;
Physiology of the excretory system: organizational structure and functions of the kidney, urine formation, glomerular filtration rate, secretion and excretion of metabolites, control of water and electrolytes. Regulation of acid base balance and temperature regulation in health and disease situations–
Functions of the skin: endothermic, poikilothermic and homoeothermic animals, body temperature regulation, animal physiological response to cold and hot environment, animal adaptation to hot climate, water and mineral balance.

Assessment Strategies:
Continuous Assessment: minimum 2 theory assessments and at least 7 marked practical assessments
Examination: 1 x 3hr paper

BVM 3651 VETERINARY PARASITOLOGY I

Module Title:	VETERINARY PARASITOLOGY I
Code:	BVM 3651
NQF Level:	6
Contact Hours:	Lectures: 4 x 1hr / week each semester Practicals: 1 x 3hr / week each semester
NQF Credits:	16
Pre-requisites:	BLG 3511
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
In this module the veterinary ectoparasites (Biting flies, ticks and mites, and mosquitoes and fleas) relevant to Namibia and Southern Africa will be studied. Veterinary Entomology will cover the morphology and biology of various arthropod ectoparasites, and concentrate on the lifecycle, diagnosis and control of selected species. Particular attention will be paid to the effects of chemical anti-parasitic drugs on the environment, and ways to minimise this will be studied. The role and importance of biological control methods will also be discussed. The role of arthropods as vectors will be covered as well as vector control and the economic importance of parasitic diseases. Veterinary acarology will focus on ticks and mites as well as the diseases they cause.

Assessment Strategies:
Continuous Assessment: Minimum 3 theory assessments and at least 5 marked practical assessments

Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%)

BVM 3602 VETERINARY IMMUNOLOGY AND VACCINOLOGY

*M*odule Title:	VETERINARY IMMUNOLOGY AND VACCINOLOGY
Code:	BVM 3602
NQF Level:	6
Contact Hours:	Lectures: 2 x 1hr / week each semester Practicals: 1 x 3hr practical / alternate week each semester
NQF Credits:	8
Pre-requisite:	None
Co-requisites:	BVM 3601
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:

The module will cover the following topics: History and definition of concepts, types of immunity , tissues, organs and cells of the immune system, antigens and immunogenicity, antibodies and their interactions, Immune dysfunction including: autoimmunity and autoimmune diseases, immune response to bacterial, fungal, viral and parasitic infections; relationship between immunology and vaccinology, the general principles of immunization and vaccines, types of vaccines, composition and development, factors affecting vaccine efficacy; vaccine preventable diseases, vaccination policy and immunization schedules with reference to Namibia.

The practical sessions will introduce students to blood collection and serum processing, applications of immunology: immuno-serological reactions, vaccination and other immunization techniques, as well as serological diagnosis of common animal diseases encountered in Namibia.

Assessment Strategies:

Continuous Assessment: minimum 2 theory assessments and at least 3 marked practical assessments
Examination: 1 x 2hr paper

BVM 3632 APPLIED PRODUCTION ANIMAL ANATOMY

Module Title:	APPLIED PRODUCTION ANIMAL ANATOMY
Code:	BVM 3632
NQF Level:	6
Contact Hours:	7 hours of integrated theory and practicals/ week each semester
NQF Credits:	16
Pre-requisites:	BVB 3511, BVB 3512, BVB 3502
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:

The module will focus on applied (clinical and topographic) of production animals. Topics to be covered include: topographic anatomy of the head, neck, forelimb, hindlimb, thorax, abdomen and pelvis and perineum in ruminants and pigs. The anatomy of birds will be treated separately using a systems approach to highlight anatomical adaptations for flight, oviposition. Aspects of avian anatomy relevant to restraint and surgical/medical interventions will also be given priority. Knowledge gained in topographic anatomy of production animals will be flagged as a basis for understanding subsequent veterinary medical studies such as pathology, local anaesthesia, medical imagery, surgery, therapeutics and clinical diagnostics of these species.

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 2 practical assessments
Examination: 1 x 2hr practical examination (50%) and 1 x 3hr paper (50%)

BVM 3652 VETERINARY PARASITOLOGY II

Module Title:	VETERINARY PARASITOLOGY II
Code:	BVM 3652
NQF Level:	6
Contact Hours:	Lecture: 4 x1hr / week each semester Practical: 1 x 3 hrs / week each semester
NQF Credits:	16
Pre-requisites:	BLG 3511
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
Students will be introduced to the general protozoology, as well to major protozoa and rickettsiae of veterinary importance in Namibia, and more broadly in southern Africa. The following topics will be specifically covered: Types and classes of protozoa as well as selected genera and species of rickettsiae, their life cycles and ways of reproduction; types of hosts and vectors, role and importance of the intermediate host; the complex relationship between parasite, intermediate host and final host; mode of transmission of protozoa and rickettsiae, methods of dissemination of the infective stages, pathogenesis, diagnosis, control and prevention of protozoan and rickettsial diseases of veterinary importance. Furthermore, veterinary ectoparasites (e.g., mosquitoes, biting flies, fleas, lice, ticks and mites) relevant to Namibia and southern Africa will be studied. The module will cover the morphology and biology of various arthropod ectoparasites and concentrate on the life cycle, diagnosis and control of selected species. An emphasis will be put on the relevance of ectoparasites as vectors and/or intermediate hosts of protozoan/rickettsial diseases and economic importance as well as impact on humans will be discussed. Particular attention will be paid to the effects of chemical anti-parasitic drugs on the environment, and ways to minimise this will be studied. The role and importance of biological control methods will also be discussed.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 5 marked practical assessments
Examination: 1 x 2 hrs practical examination (40%) and 1 x 3 hrs theory paper (60%)

BVM 3612 ANIMAL NUTRITION AND PASTURE SCIENCE

Module Title:	ANIMAL NUTRITION AND PASTURE SCIENCE
Code:	BVM 3612
NQF Level:	6
Contact Hours:	Lecture: 4 x1hr / week each semester Practical: 1 x 3 hrs / alternate week each semester
NQF Credits:	16
Pre-requisites:	BVB 3512, BVB 3502
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
This module acquaints students with animal nutrition including key concepts and terminologies and the role of animal nutrition. It exposes students to different topics relating to animal nutrition of various production and companion animals. This includes laboratory feeds analysis and feed evaluation; general comparison of plants and other sources of nutrients, animal feeds; plants as feed sources with special focus on nutritive values, availability, affordability; feed fractions and their nutritional implications; digestibility and degradability experiments; different techniques used for feed analysis ; use of feed value estimates; mineral and vitamin nutrition; forage and hay quality; utilization of rangelands by herbivores; management options; concept of rotational grazing. Application of appropriate measures towards preservation of nutritive value of pastures, hay and forages; feed formulation based on animal nutritional requirements; the concept of palatable and non-palatable pastures adapted to the Namibian climatic conditions; establishment of perennial and annual pastures; natural and planted pastures, utilization and management. The module will further cover nutritional imbalance disorders including metabolic diseases and their management.

Assessment Strategies:
Continuous Assessment: minimum 2 theory assessments and at least 3 marked practical assessments
Examination: 1 x 3hr paper

BVM 3622 ANIMAL PRODUCTION

Module Title:	ANIMAL PRODUCTION
Code:	BVM 3622
NQF Level:	6
Contact Hours:	Lecture: 1x 2hrs / week each semester Practicals: 1 x 3hrs / alternate week each semester
NQF Credits:	8
Pre-requisites:	None
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
The module will cover the following topics: the origins of livestock and their distribution in Africa, especially in the southern Africa region; livestock breed characteristics (cattle, pigs, goats and sheep) farmed in Namibia; the

importance of livestock for the Namibian economy; livestock production systems applied in Namibia; livestock and livestock by-products markets, marketing channels; identification and traceability (NamLITS), and transportation, Namibia's livestock trade and trading partners; opportunities and challenges in the livestock industry particularly in Namibia.

Assessment Strategies:
Continuous Assessment: minimum 2 theory assessments and at least 3 marked practical assessments
Examination: 1 x 2 hr paper

BVM 3642 BIOMETRY

Module Title	BIOMETRY
Code:	BVM 3642
NQF Level:	6
Contact Hours:	Lectures: 2 x 1hr / week each semester Tutorials: 1 x 1hr / week each semester
NQF Credits:	8
Pre-requisites:	MAT 3511
Co-requisite	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
The following topics will be covered in this module:
Introduction to biometry, types of data, random sampling; hypothesis testing; central tendency and variance; single samples, power analysis and data transformation; probability; inferences for one sample; summarizing and describing data; the two sample problem; contingency tables; introduction to non-parametric methods; the analysis of count data; analysis of variance; analysing proportion data; large data sets;
Statistics: Descriptive, inferential; variables; qualitative versus quantitative; Data types: Primary versus secondary, categorical versus discrete, continuous; Sources of data: Population versus sample; types of measurements: Nominal, ordinal, Interval, ratio scales;
Presentation of data: Tabular forms and graphical methods: histograms, pie charts, bar charts, frequency polygons, ogives, stem-and-leaf plots, box –and-whiskers plots; Measures of central tendency: Z notation, mean, median, mode, quartiles, percentiles; Measures of dispersion: Variance, standard deviation, range, inter-quartile range, skewness and kurtosis; Identification of outliers: Use of scientific calculators and computer software for statistical manipulation, Application of statistical analysis in biological research.

Assessment Strategies:
Continuous Assessment: minimum 2 theory assessments
Examination: 1 x 2hr paper

BVM 3609 FIELD PRACTICAL TRAINING I: LABORATORY

Module Title:	FIELD PRACTICAL TRAINING I: LABORATORY
Code:	BVM 3609
NQF Level:	6
Contact hours:	1 week
NQF Credits:	4
Pre-requisites:	None
Co-requisite:	None
Compulsory/Elective:	Compulsory
Semester Offered:	1 or 2

Module Contents:
Students will visit registered veterinary diagnostic laboratories to participate in daily activities and management of operations.

Assessment Strategies
Continuous Assessment: 100%

L.10.3 THIRD YEAR MODULES

BVM 3700 VETERINARY PHARMACOLOGY

Module Title:	VETERINARY PHARMACOLOGY
Code:	BVM 3700

NQF Level:	7
Contact Hours:	Lectures: 4 x 1hr lectures per/ week each semester Practicals: 1 x 3hrs / alternate week each semester
NQF Credits:	16
Pre-requisites:	BVB 3512, BVM 3611, BVM 3651, BVM 3652
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
The Pharmacology section will cover basic pharmacotherapeutic principles, pharmacodynamics, and pharmacokinetics. The classification of drugs and legal requirements for storing, dispensing, prescribing and disposing of veterinary drugs as well as biosafety and biosecurity considerations. The following topics will addressed: functional pharmacology, chemotherapeutics, and systemic drugs acting on the various organ systems.

Assessment Strategies:
Continuous Assessment: Minimum 3 theory assessments
Examination: 1 x 3 hr theory paper

BVM 3721 HERD HEALTH MANAGEMENT AND ECONOMICS I

Module Title:	HERD HEALTH MANAGEMENT AND ECONOMICS I
Code:	BVM 3721
NQF Level:	7
Contact Hours:	Lecture: 1x 2hrs / week each semester Practicals: 1x3 hrs/ alternate week each semester
NQF Credits:	8
Pre-requisites:	BVB 3671, BVM 3622, BVM 3602
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
Herd Health Management: The module will cover aspects of herd health, production and reproduction management programs in beef cattle. Emphasis will be given to monitoring and management of herd dynamics and nutrition in cattle
Animal Health Economics : The module will cover the importance of animal diseases in efficiency of animal production, consumers' perceptions of animals and animal products, and global trade; analyse economic problems using basic methods such as partial budgeting, cost-benefit analysis and decision analysis; detail the critical steps in systems analysis and choose appropriate modelling types and techniques. The module will also cover implementation and evaluation of animal health programs, and policy development and implementation processes.
Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments
Examination: 1 x 2hr theory paper

BVM 3711 INFECTIOUS DISEASES I

Module Title:	INFECTIOUS DISEASES I
Code:	BVC 3711
NQF Level:	7
Contact Hours:	Lectures: 4 x 1hr lectures /week each semester Practicals: 1 x 3hr practical / week each semester
NQF Credits:	16
Pre-requisites:	BVM 3611 Introduction to Veterinary Microbiology
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
The module will cover the overview on virology, viral diseases, pathogenesis of viral diseases, diagnosis, treatment and control of viral diseases, virus families and associated diseases. Prions and prion diseases will also be discussed.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments
Examination: 1 x 3hr theory paper

BVM 3740 VETERINARY TOXICOLOGY

Module Title:	VETERINARY TOXICOLOGY
Code:	BVM3740
NQF Level:	7
Contact Hours:	Lectures: 2 x 1hr lectures /week each semester Practicals: 1 x 3hr practical / week each semester
NQF Credits:	8
Pre-requisites:	BVB3532, BVM3611
Co-requisite:	BVM3720
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:

Toxicology will cover the study of the nature, effects and detection of various types of poison and poisoning, and the treatment of poisoning. This module will include identification relevant toxic plants of importance in the livestock industry in Namibia, their identification, habitat, and phenology, effects on various species, economic importance, and treatment.

Assessment Strategies
Continuous Assessment: Minimum 2 theory assessments and at least 2 marked practical assessments
Examination: 1 x practical examination to identify toxic plants and other poisons (40%) and 1 x 3hr theory paper (60%)

*B*VM 3781 ETHNO-VETERINARY MEDICINE

Module Title:	ETHNO-VETERINARY MEDICINE
Code:	BVM 3781
NQF Level:	7
Contact Hours: Lectures:	1hr lecture/ week Practicals/Tutorials: 4 practical sessions including tutorials
NQF Credits:	4
Pre-requisites:	None
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
This module covers traditional animal health care which encompasses the knowledge, skills, methods, practices, and beliefs about animal health care found among members of a particular community. This module is specifically intended to expose the students to the practices of the indigenous disease-prevention and treatment methods carried out by farmers, traditional healers particularly in communal areas in Namibia. Available information will be provided on treatment of animal diseases according to whether they conform to standard veterinary practice or close equivalents, or could be supported by scientific knowledge, or judged by traditional healers to be effective.

The following topics will be covered: Indigenous Knowledge Systems (IKS) as related to the use and application of herbal and traditional medicines, identification, collection and preparation of medicinal plants. The practical part of this module will focus on the collection and identification and classification of herbal/medicinal plants, identification and profiling of medicinal plant extracts.

This module will also cover ethno-veterinary practices-contemporary relevance and conservation of bioresources, ethno-botany and pharmacognosy, Traditional Medicine Systems (TMS) and the practice of ethno-veterinary medicine as related to the different farming systems in developing countries and particularly in the communal areas in Namibia.

Documentation of Local Health Traditions (LHTs). Pharmacological basis of ethno-veterinary medicine, PRA and Assessment of Local health traditions, functional herbal remedies for primary health care of livestock, Use of plant products in animal production and health as applied in Namibia.

Assessment Strategies:
Continuous Assessment: minimum 2 theory assessments and at least 3 marked practical assessments/tutorials. No examination will be written for this module.

BVC 3702 FISH AND BEE MEDICINE

Module Title:	FISH AND BEE MEDICINE
Code:	BVC 3702
NQF Level:	7
Contact Hours:	Lectures: 2 x 1hr lectures per week each semester Practicals: 1x3 hrs/ alternate week each semester
NQF Credits:	8
Pre-requisites:	BVM 3642
Co-requisite:	None
Compulsory / Elective:	Compulsory

Semester Offered: 1

Module Content:
Fish medicine: This module will acquaint students with an overview of fish anatomy followed by fish husbandry as well as the aetiology, diagnosis, pathology, pathogenesis, chemotherapy, control, and management of infectious and non-infectious diseases of fish.

Bee medicine: This module will acquaint students with knowledge of honey bee husbandry as well as the aetiology, diagnosis, pathology, pathogenesis, control, and management of infectious and non-infectious diseases of bees.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments
Examination: 1 x 2hr paper

BVM 3760 GENERAL SURGERY, ANAESTHESIOLOGY AND DIAGNOSTIC IMAGING

Module Title	GENERAL SURGERY, ANAESTHESIOLOGY AND DIAGNOSTIC IMAGING
Code:	BVM 3760
NQF Level:	7
Contact Hours:	4 x 1hr / week Practicals: 1 x 3hr practical / week
NQF Credits:	16
Pre-requisites:	BVM 3611, BVM 3552, BVB3511, BVB3502, BVB3512
Co-requisites:	BVM 3700
Compulsory / Elective:	Compulsory
Semester Offered:	1 & 2

Module Content:
General anaesthesiology: This introductory module in veterinary anaesthesiology will focus on the anaesthetist's role for the safe anaesthetic management of patients using injectable and inhalation anaesthetics. This requires an understanding of patient evaluation, selection and knowledge of premedication, induction and maintenance anaesthetic drugs as well as anaesthetic equipment, monitoring depth of anaesthesia and physiologic function. Species specific differences with regards to drug and equipment choices/requirements will be discussed.

Introduction to surgery: This introductory module will cover the basic principles of modern veterinary surgery, including asepsis, suture materials, suture patterns, haemostasis and surgical instrumentation. This module will also include bandaging.

Veterinary diagnostic imaging: Introductory lectures will focus on radiographic and ultrasonographic equipment, radiation safety, production of diagnostic quality radiographs and ultrasound images. Basic principles of interpretation of radiographs and ultrasonographs will be covered.

Assessment Strategies:
Continuous Assessment: Minimum of two theoretical assessments and 3 marked practical assignments per semester
Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%) at the end of semester 2.

BVM 3722 HERD HEALTH MANAGEMENT AND ECONOMICS II

Module Title:	HERD HEALTH MANAGEMENT AND ECONOMICS II
Code:	BVM 3722
NQF Level:	7
Contact Hours:	Lecture: 1x 2hrs / week each semester Practicals: 1x3 hrs/ alternate week each semester
NQF Credits:	8
Pre-requisites:	BVB 3651, BVM 3622, BVM 3602
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
Herd Health Management: The module will cover aspects of herd health, production and reproduction management programs in dairy cattle and small stock. Emphasis will be given to dry period, milk production, herd fertility, udder health, lactation and nutrition in dairy cattle. Metabolic disease conditions and mastitis will be emphasized. Similarly, the flock health, nutrition and production management of small stock will also be discussed. Biosecurity measures and the containment of diseases will be discussed.

Economical aspects of the dairy herd and productivity schemes, record keeping and gynaecological herd health will be emphasized. Different parlour types and milking machines will be covered.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments
Examination: 1 x 2hr theory paper

BVM 3720 GENERAL PATHOLOGY

Module Title:	GENERAL PATHOLOGY
Code:	BVM 3720
NQF Level:	7
Contact Hours:	Lecture: 2 x 1hr / week Practicals: 1 x 3 hr practical every other week
NQF Credits:	16
Pre-requisites:	BVB 3512, BVM 3651, BVM 3652, BVM 3602, BVM 3652, BVB3511, BVB3502, BVC3611
Co-requisites:	
Compulsory / Elective:	Compulsory
Semester Offered:	1 & 2

Module Content:
This module will cover common post mortem changes, disease detection/diagnosis after somatic death, cell responses to different grades of stimuli/injuries (cellular adaptation), cellular/tissue lesions and death, lesions due to disturbance of growth and cell differentiation, degenerative lesions and necrosis, lesions due to circulatory disturbances, hypersensitivity and aberrant immunological reactions. Practical training will expose the student to techniques used in a post mortem examination. In addition will students will be required to attend necropsies.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory and 3 practical assessments per semester
Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%)

BVM 3712 INFECTIOUS DISEASES II

Module Title:	INFECTIOUS DISEASES II
Code:	BVM 3712
NQF Level:	7
Contact Hours:	Lecture: 1x 4hrs / week each semester Practicals: 1x3 hrs/ week each semester
NQF Credits:	16
Pre-requisites:	BVC 3601
Co-requisite:	BVM 3711
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
The module will focus on bacterial pathogenesis and host defences, staining of bacteria, culture media and culturing and isolation of bacteria, selective and non-selective isolation of pathogenic bacteria, biochemical tests. Furthermore, emphasis will be placed on pathogenic bacteria with regards to clinical signs, transmission, vectors and aetiology of disease, diagnosis and treatment with particular emphasis on notifiable and tropical diseases.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments
Examination: 1 x 3hr theory paper

BVM 3732 VETERINARY EPIDEMIOLOGY II

Module Title:	VETERINARY EPIDEMIOLOGY II
Code:	BVM 3732
NQF Level:	7
Contact Hours:	Lectures: 2 x 1hr lectures per week each semester
Tutorials:	Tutorials: 1 x 3hr / alternate week each semester
NQF Credits:	8
Pre-requisites:	BVM3642
Co-requisite:	BVM 3712, BVM3731
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
This module covers the theoretical and practical application of methods used in designing epidemiological studies, data and information management, applying concepts of monitoring and surveillance including principles of risk based surveillance. Introduction to risk analysis and its application to veterinary medicine will be covered. Planning, designing, managing and implementing disease control, prevention, eradication programmes at different levels including contingency planning, awareness, and communication and extension methods. The One Health Concept will be introduced. Introduction to principles of livestock economics and their application in policy, strategy, programme and project formulation including disease control management. The application of principles of economics to enterprise management, investment analysis and animal health care and veterinary delivery systems will be covered.
Assessment Strategies:
Continuous Assessment: minimum 3 assessments
Examination: 1 x 2hr paper

BVM 3709 FIELD PRACTICAL TRAINING II: GAME RESERVES

Module Title:	FIELD PRACTICAL TRAINING II: GAME RESERVES
Code:	BVM 3709
NQF Level:	7
Contact hours:	1 weeks
NQF Credits:	4
Pre-requisites:	None
Co-requisite:	None
Compulsory/Elective:	Compulsory
Semester Offered:	2

Module Contents:
Students will visit registered conservancies or game reserves to participate in daily activities and management of operations.

Assessment Strategies
Continuous Assessment: 100%

L.10.4 FOURTH YEAR MODULES

BVM 3821 CLINICAL PATHOLOGY

Module Title:	CLINICAL PATHOLOGY
Code:	BVM 3821
NQF Level:	8
Contact Hours:	7 hours per week of integrated learning and instruction (Lectures and Practicals) each semester
NQF Credits:	8
Pre-requisites:	
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
This module will cover laboratory testing of animal species in the fields of hematology, clinical biochemistry, diagnostic cytology, immunology and urinalysis.

Theoretical and practical training with emphasis on the skills required to take samples of blood and other body fluids from live animals or during post mortem examinations, including peritoneal, thoracic, and intra cardiac fluid, urine, and pus; and to analyse these samples using appropriate laboratory methods. In addition, different techniques of performing biopsies of healthy and diseased tissue and tumours will be taught.

Preparation of diagnostic samples including special staining techniques, separating and preserving different fractions of blood samples, and fixing or diluting samples for later use or for transportation will be covered.

Specific techniques will include complete blood count, coagulation testing, biochemistry of blood enzymes, as well as designing and performing pre-screening panel tests such as a pre-surgical panel, geriatric panel, neonatal panel.

Setting up and maintenance of blood banks and colostrum banks for various species will also be covered.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments

Examination: 1 x 2hr theory paper (50%) and 1 x 1hr practical exam (50%)

BVC 3800 SYSTEMIC PATHOLOGY

Module Title:	SYSTEMIC PATHOLOGY
Code:	BVM 3800
NQF Level:	16
Contact Hours:	Lectures: 1 x 2hr lectures per week Practicals: 1x3 hrs/ alternate week
NQF Credits:	8
Pre-requisites:	BVM 3720 General Pathology
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1 & 2

Module Content:
This module will emphasize diseases affecting body systems, specifically the cardiovascular, reproductive, digestive, urinary, musculoskeletal, cutaneous, respiratory, endocrine, haemopoietic, hepatobiliary and neurological systems with regards to the following: major and common malformations affecting the system and their characteristic features, degenerative lesions and their gross and microscopic pictures, inflammatory lesions and their gross and microscopic pictures, tissue lesions due to diseases affecting the system, special lesions peculiar to the systems, parasites found in the system and their effects, neoplasms especially primary neoplasms affecting the system.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments per semester
Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%).

BVC 3801 WILDLIFE CLINICAL STUDIES I

Module Title:	WILDLIFE CLINICAL STUDIES I
Code:	BVC 3801
NQF Level:	7
Contact Hours:	3 or 5 (alternately) hours of integrated learning and instruction (Lectures and Practicals) per week each semester
NQF Credits:	8
Pre-requisites:	BVM 3709
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
This module will provide an overview to wildlife veterinary science as it relates to both conservation and the wildlife industry. It will cover the major infectious diseases of wildlife and the transmission of these diseases both within wildlife and to domestic animals and man. The module will examine control measures for transmissible wildlife diseases from a One Health perspective including the effect of habitat loss and limited nutrition , fencing, movement control, vaccination and Commodity Based Trade (as it relates to wildlife). Wildlife trade, both legal and illegal, will be examined and its potential veterinary impact on wildlife, domestic animals and humans will be examined.

A basic understanding of the biological principles underpinning wild animal conservation and management, will be presented together with an awareness of current problems in wildlife disease with implications for wildlife conservation and welfare. Emerging infectious diseases as a serious hazard both for wild animal species and for the domestic animal and human populations will be discussed. Wildlife nutrition, veldt management and basic wild animal behaviour will be covered, while the principles of game ranch management, tourism, hunting, live sales and game meat production will be examined.

The relevance of disease control and treatment in game ranching and breeding facilities will be compared to that in the free-ranging situation, where risks need to be quantified while control and treatment may not be appropriate or practical. The role of disease in the ecosystem and its effects on population dynamics will be presented, together with the impact of certain veterinary actions may have on biodiversity and the ecology interface. Basic wildlife pathology, similarities and differences to domestic animal pathology will be presented. Field post mortem examination, sample collection, preservation and processing will be covered. Additionally the module will cover how to undertake statistically-meaningful epidemiological surveys within wildlife including specimen sampling for infectious disease screening.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments

Examination: 1 x 2hr theory paper (50%) and 1 x 1 hr practical exam (50%)

BVM 3811 VETERINARY PUBLIC HEALTH I

Module Title:	VETERINARY PUBLIC HEALTH I
Code:	BVM 3811
NQF Level:	8
Contact Hours:	Lecture: 1x 4hrs / week each semester Practicals: 1x3 hrs/ alternate week each semester
NQF Credits:	16
Pre-requisites:	BVM 3651 BVM 3652 BVM 3720 BVM 3711 BVM 3712
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
This module will provide students with an overview of the role of the veterinary professional with respect to the protection of the health of the public. Principles of Hazard Analysis and Critical Control Points (HACCP) and methods used to evaluate the risk of disease transmission, basic principles of food safety control (red meat, poultry meat, milk and eggs). The module will provide students with a comparative overview of the most important zoonotic, waterborne and food borne diseases.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments
Examination: 1 x 3hr theory paper (60%) and 1 x 2hr Practical exam (40%)

BVC 3831 PRODUCTION ANIMAL CLINICAL STUDIES I

Module Title:	PRODUCTION ANIMAL CLINICAL STUDIES I
Code:	BVC 3831
NQF Level:	8
Contact Hours:	7 hours /week of integrated learning and instruction (Lectures and Practicals) each semester
NQF Credits:	16
Pre-requisites:	BVM 3670, BVM 3711, BVM3712, BVM3731, BVM3740
Co-requisite:	BVC3832
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
The module will cover health, breeding, husbandry, disease diagnosis and treatment of pigs and poultry.

Pigs: nutrition and related disorders as well as diagnosis and treatment of important parasitic and infectious diseases and other miscellaneous conditions in pigs. Applied surgical techniques will be covered. A problem solving approach on a herd basis strives to improve the health status and production effectiveness of intensive and extensive piggeries from a holistic and cost-effective viewpoint.

Poultry: Poultry flock health and management programmes, including vaccination programs, aspects of housing and production systems, nutrition and nutritional diseases will be studied. Diagnosis and treatment of parasitic and infectious diseases of importance in the industry will be covered. Avian anatomy will also be studied in this module.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 7 marked practical assessments
Examination: 1 x 3hrs theory paper (60%) and 1 x 2 hr practical exam (40%)

BVM 3801 VETERINARY PROFESSIONAL SKILLS

Module Title:	VETERINARY PROFESSIONAL SKILLS
Code	BVM 3801
NQF Level	8
Contact hours	Lectures: 2 x 1hr lectures per /week each semester
NQF Credits	8

Pre-requisite C0-	None
requisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Concepts of animal health consultation; stress and its management; effective communication skills (basic communication and consultation skills based on a predominantly relationship-centred style, being able to apply and identify effective clinical interviewing techniques); business budgeting skills, identifying sources and symptoms of stress and practicing stress management techniques). This module also covers business management including personal and business finance, marketing and teamwork, communication and professionalism. Staff management and budgeting, and control of finances will be a major section of this module. Veterinary ethics, interpersonal communication, interpersonal skills as well as client relationship will also be discussed.

Assessment Strategies:
Continuous Assessment: 100 % (Minimum 3 assessments)

BVC 3811 COMPANION ANIMAL CLINICAL STUDIES

Module Title:	COMPANION ANIMAL CLINICAL STUDIES
Code:	BVC 3811
NQF Level:	8
Contact Hours:	Lecture: 1 x 1 hr / week
NQF Credits:	4
Pre-requisites:	BVM 3602, BVM 3652, BVM 3700, BVC3611, BVM3740
Co-requisite:	BVC3812, BVM3821
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
This is a multi-disciplinary module where applied clinical pathology, diagnostic imaging, anaesthesiology and medicine are integrated to introduce the student to a holistic approach to the diagnosis and treatment of cage birds. Course material will provide students with an understanding of the pathophysiology, diagnosis, clinical management and best treatment options of the most important disease processes affecting the various organ systems of cage birds.

Assessment Strategies:
Continuous Assessment: 100 % (Minimum 2 assessments)

BVM 3812 VETERINARY PUBLIC HEALTH II

Module Title:	VETERINARY PUBLIC HEALTH II
Code:	BVM 3812
NQF Level:	8
Contact Hours:	Lectures: 4x 1hr lectures per week each semester Practicals: 1x3 hrs / week each semester
NQF Credits:	16
Pre-requisites	BVM 3752, BVM 3651, BVM 3652, BVM 3711, BVM 3712
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
This module should provide the students with a broad understanding of veterinary public health programmes. It includes environmental health, food safety and inspection, as well as biological waste management. It further covers development and enforcement of laws and regulations impacting animal-derived food processing industries and food consumers (e.g. traceability and ante- and post-mortem inspection and certification requirements, with emphasis on meat inspection. Pathological conditions associated with the transport of food animals and meat inspection, Hygiene in abattoirs, Health implications of emergency and causality slaughter. The module outlines approaches to microbiological and physical foodborne hazard identification, testing and sampling; and foodborne hazard prevention and control). Animal welfare standards at abattoirs will also be covered. Ante-mortem inspection of ruminants and pigs and inspection of poultry and aquatic foods (fish) for human consumption.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 5 marked practical assessments
Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%)

BVC 3812 COMPANION ANIMAL CLINICAL STUDIES II

Module Title:	COMPANION ANIMAL CLINICAL STUDIES II
Code:	BVC 3812
NQF Level:	8
Contact Hours:	7 hours / week of integrated learning and instruction (Lectures and Practicals) each semester
NQF Credits:	16
Pre-requisites:	BVC3611, BVM 3602, BVM3652, BVM3700, BVM3740
Co-requisites:	BVC3811
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
This is a multi-disciplinary module where applied clinical pathology, diagnostic imaging, anaesthesiology, medicine and surgery are integrated to equip the student with a holistic approach to the diagnosis and treatment of companion animal patient including horses and cage birds. The main focus will be on hepatic and pancreatic disease, nephrology and urology diseases. Common reproductive disorders in small animals will be included.

Course material will provide students with an understanding of the pathophysiology, diagnosis, clinical management and best medical or surgical treatment options of diseases affecting various organ systems.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 7 marked practical assessments
Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%)

BVC 3802 WILDLIFE CLINICAL STUDIES II

Module Title:	WILDLIFE CLINICAL STUDIES II
Code:	BVC 3802
NQF Level:	7
Contact Hours:	3 or 5 hours per week (alternately) of integrated learning and instruction (Lectures and Practicals) each semester
NQF Credits:	8
Pre-requisites:	BVM 3701, BVM 3702
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
This module will cover theoretical and practical training with emphasis on the skills required to capture, transport, care and manage free-ranging and indigenous captive animals.

From a conservation perspective it will cover interventions required in wild animal health to address human- wildlife conflict, metapopulation management through translocation, as well as to reduce the risk from disease in reintroduction and translocation programmes. Additionally relevant aspects of capture and translocation as it relates to wildlife ranching will be discussed.

The fundamentals of physiology, pharmacology and applied pharmacology in wildlife anaesthesia will be presented, and both theoretical and practical training in the use of drugs used in the tranquilisation, anaesthesia and immobilisation of wild animals for their capture, transport and care will be provided. Principles of chemical and physical capture systems will also be covered, as will safety issues and procedures in the event of accidental exposure. Anaesthesia in the captive in the captive wildlife situation will also be discussed, as well as the growing threat of wildlife poisoning.

The planning and undertaking of wildlife veterinary capture operations will be presented. Identifying risks to employer and owner, quantifying the risk and plans to mitigate the risk. Regulations pertaining to the use of drugs commonly used in wildlife immobilisation, the movement of game and their products as it relates to conservation and the game industry, and the control of disease within wildlife will be covered.

Design and specifications for holding bomas and quarantine facilities will be presented together with suitable species-specific equipment and transport required for the capture and transport of wildlife. Wildlife handling and boma management (nutrition, disease testing and prevention) , and animal welfare issues will be covered. The hand –rearing of the more common game species will be examined.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments

Examination: 1 x 2hr theory paper (50%) and 1 x 1 hr practical exam (50%)

BVC 3832 PRODUCTION ANIMAL CLINICAL STUDIES II

Module Title:	PRODUCTION ANIMAL CLINICAL STUDIES II
Code:	BVC 3832
NQF Level:	8
Contact Hours:	7 hours / week of integrated learning and instruction (Lectures and Practicals) each semester
NQF Credits:	16
Pre-requisites:	BVM3670, BVM3711, BVM3712, BVM3731, BVM3740
Co-requisite:	BVC3831
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
This module provides information on the common disorders of the major body systems of cattle, sheep and goats. Clinical signs, diagnostic tests and treatments options for disorders of individual animals as well as herd management, including preventative care and selected surgical procedures will be emphasized. It focuses on pathophysiology, symptomatology, differential diagnoses, diagnostic approach, clinical management (medical and surgical) and prognosis of the more important/common clinical conditions affecting cattle, sheep and goats related to gastro-intestinal, urinary, respiratory and cardiovascular systems. Areas of focus include gastroenterology which will present important medical and surgical conditions affecting the digestive tract in ruminants, liver and pancreatic disease; nephrology and urology presentation of renal, ureteral, cystic, and urethral diseases; and respiratory and cardiovascular diseases.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 7 marked practical assessments
Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%)

BVM 3882 RESEARCH METHODOLOGY

Module Title:	RESEARCH METHODOLOGY
Code:	BVM 3882
NQF Level:	8
Contact hours:	Lectures: 7 guided self-study online assignments using a blended learning approach
NQF Credits:	8
Pre-requisites:	BVM 3731, BVM3732
Co-requisite:	None
Compulsory/Elective:	Compulsory
Smester offered:	2

Module Contents:
The module covers the research process: research problem formulation and research objectives, research, methods and principles of research and experimental design, sampling methods including sample size determination and replication; ethics of research; the scientific method; observations, asking questions and formulation of hypothesis (null and alternative), predictions. Biological variation, populations and sampling and statistical significance will be covered.
Scientific writing, a literature review, a research proposal, report writing, plagiarism, finding and using literature references, citation of references, presentation of results will be covered.

Assessment Strategies
Continuous Assessment: 7 evaluated bi-weekly assessments (100%)

BVM 3809 FIELD PRACTICAL TRAINING III: PRIVATE/STATE VETERINARY CLINIC

Module Title:	FIELD PRACTICAL TRAINING III: PRIVATE/STATE VETERINARY CLINIC
Code:	BVM 3809
NQF Level:	8
Contact hours:	2 weeks (1 week each Private Veterinary Clinics and State Veterinary Clinics)
NQF Credits:	8
Pre-requisites:	None
Compulsory/Elective:	Compulsory

Semester Offered: 1 or 2

Module Contents:
This module is designed to further expose students to the realities of working in either a private or state veterinary clinic. They are expected to observe and participate in different facets of clinical examinations, disease diagnosis, veterinary surgery and diagnostic imaging, provision of extension services and assist with management functions.

Assessment Strategies:
Continuous Assessment: 100%

L.10.5 FIFTH YEAR MODULES

BVC 3851 COMPANION ANIMAL CLINICAL STUDIES III

Module Title:	COMPANION ANIMAL CLINICAL STUDIES III
Code:	BVC 3851
NQF Level:	8
Contact Hours:	7 hours / week of integrated learning and instruction (Lectures and Practicals) each semester
NQF Credits:	16
Pre-requisites:	BVC 3811, BVC 3812, BVM3821
Co-Requisites:	BVC3872
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
This is a multi-disciplinary module where applied clinical pathology, diagnostic imaging, anaesthesiology, medicine and surgery are integrated to equip the student with a holistic approach to the diagnosis and treatment of small animal patient including cage birds. Topics to be covered include anatomy, pathophysiology of various systems including neural and musculoskeletal. In addition, various aspects of oral pathology and dentistry will be discussed. Treatment of behavioural problems using appropriate medicine and training methods will be covered.

Course material will provide students with an understanding of the pathophysiology, diagnosis, clinical management and best medical or surgical treatment options of diseases and trauma affecting various organ systems.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 7 marked practical assessments
Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%)

BVC 3871 PRODUCTION ANIMAL CLINICAL STUDIES III

Module Title:	PRODUCTION ANIMAL CLINICAL STUDIES III
Code:	BVC 3871
NQF Level:	8
Contact Hours:	7 hours / week of integrated learning and instruction (Lectures and Practicals) each semester
NQF Credits:	16
Pre-requisites:	BVC 3831, BVC 3832
Co-requisites:	BVC3872
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
This module provides information on the common disorders of the major body systems of cattle, sheep and goats. Clinical signs, diagnostic tests and treatments options for disorders of individual animals as well as herd management, including preventative care and selected surgical procedures will be emphasized. It focuses on pathophysiology, symptomatology, differential diagnoses, diagnostic approach, clinical management (medical and surgical) and prognosis of the more important/common clinical conditions affecting cattle, sheep and goats related to musculoskeletal, central nervous, cutaneous, hemolymphatic and reproductive systems.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 7 marked practical assessments
Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%)

BVE 3800 EQUINE CLINICAL STUDIES

Module Title:	EQUINE CLINICAL STUDIES
Code:	BVE 3800
NQF Level:	8
Contact Hours:	5 hours / week of integrated learning and instruction (Lectures and Practicals) each semester
NQF Credits:	16
Pre-requisites:	BVM3701
Co-requisites:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
This module concentrates on the diagnosis, treatment and control of conditions and diseases affecting the various organ systems of the horse. It gives an integrated approach covering aspects of infectious and parasitic diseases, clinical diagnostics, clinical pathology, diagnostic imaging, medical and surgical treatment options as well as preventative measures.

The module will cover various gastro-enteric and respiratory diseases and conditions, including the approach to a patient with colic. The study of the musculoskeletal disorders will emphasise the incidence, pathophysiology, and diagnosis of lameness. Equine dentistry will include routine floating of teeth as well as techniques of tooth extraction.
Furthermore, neurology will focus on disorders affecting the central and peripheral nervous systems, while in dermatology presentation of diseases of the skin and hooves will be dealt with. Common disorders of the hemolymphatic system will be covered while in ophthalmology the anatomy, pathophysiology and diseases of the eye and orbit will include medical and surgical management of common congenital and acquired ophthalmic diseases.
Oncology will cover basic diagnosis and treatment of important equine neoplasms. Equine neonatal medicine and surgery will be covered.
The insurance certification as well as pre-purchase examination of horses will discussed in detail.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 7 practical assessments
Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper 640%)

BVM 3861 WILDLIFE CLINICAL STUDIES III

Module Title:	WILDLIFE CLINICAL STUDIES III
Code:	BVM 3861
NQF Level:	8
Contact Hours:	5 hours of integrated theory and practicals/ week
NQF Credits:	8
Pre-requisites:	BVC 3801, BVC 3802
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
This module will cover an in-depth look into the capture, care and transport of the more common species chemically restrained and transported in southern Africa. This will be carried out on a species (or group of species) by species basis and will involve theoretical as well as extensive practical training.

Emphasis will be placed on animal welfare, stress and capture-related deaths, safety and first aid in the field as it applies to weapons, drugs, humans and animals, the recording of wildlife procedures and the use of helicopters and fixed wing aircraft in wildlife work. In particular focus will be on the Schedule 5 drugs, their use and the regulations pertaining to the possession and administration of the opioids routinely used in wildlife work.

Assessment Strategies:
Continuous assessment: Minimum 2 theory assessments and at least 2 marked practical assessments
Examination: 1 x 2hr practical examination (25%) and 1 x 3hr theory paper (75%).

BVM 3871 THERIOGENOLOGY I,

Module Title:	THERIOGENOLOGY, GYNAECOLOGY AND OBSTETERICS I
Module Code:	BVM 3871
NQF Level:	8

Contact Hours:	7 hours / week of integrated learning and instruction (Lectures and Practicals) for 14 weeks (98hrs)
NQF Credits:	16
Pre-requisites:	None
Co-requisites:	BVM 3832
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Content:
This module aims at developing the appropriate clinical and surgical skills of selected domestic animals with regards to reproduction (both normal and assisted) and pregnancy and parturition management and diagnosis as well as management of diseases and disorders of the female and male reproductive systems.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments
Examination: 1 x 2hr practical examination (25%) and 1 x 3hrs theory paper (75%)

BVC 3880 RESEARCH PROJECT

Module Title:	RESEARCH PROJECT
Code:	BVC 3880
NQF Level:	8
Contact hours:	N/A
NQF Credits:	30
Pre-requisites:	BVM 3882
Compulsory/Elective:	Compulsory
Semester Offered:	1 & 2

Module Contents:
Independent research on a chosen topic in any field of veterinary medicine

Assessment Strategies
Continuous Assessment 100%: Oral presentation (20%) and written research report (80%)

BVM3822 POLICY, LEGISLATION AND JURISPRUDENCE

Module Title:	POLICY, LEGISLATION AND JURISPRUDENCE
Code:	BVM 3822
NQF Level:	8
Contact Hours:	Lectures: 2 x 1hr / week each semester
NQF Credits:	8
Pre-requisites:	None
Co-requisites:	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Content:
This module provides information on the common disorders of the major body systems of cattle, sheep and goats. Clinical signs, diagnostic tests and treatments options for disorders of individual animals as well as herd management, including preventative care and selected surgical procedures will be emphasized. It focuses on pathophysiology, symptomatology, differential diagnoses, diagnostic approach, clinical management (medical and surgical) and prognosis of the more important/common clinical conditions affecting cattle, sheep and goats.
Assessment Strategies:
Continuous Assessment: minimum 2 theory assessments
Examination: 1 x 2hr paper

BVC 3872 PRODUCTION ANIMAL CLINICAL STUDIES IV

Module Title:	PRODUCTION ANIMAL CLINICAL STUDIES IV
Code:	BVC 3872
NQF Level:	8
Contact Hours:	7 hours / week of integrated learning and instruction (Lectures and Practicals) each semester
NQF Credits:	16
Pre-requisites:	BVC 3831, BVC 3832

Co-requisite: BVC3871
Compulsory / Elective: Compulsory
Semester Offered: 2

Module Content:
This module provides information on the common disorders of the major body systems of cattle, sheep and goats. Clinical signs, diagnostic tests and treatments options for disorders of individual animals as well as herd management, including preventative care and selected surgical procedures will be emphasized. It focuses on pathophysiology, symptomatology, differential diagnoses, diagnostic approach, clinical management (medical and surgical) and prognosis of the more important/common clinical conditions affecting cattle, sheep and goats related to metabolic diseases, oncology, endocrine and ophthalmology.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 7 marked practical assessments
Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%)

BVC 3852 COMPANION ANIMALS CLINICAL STUDIES IV

Module Title: COMPANION ANIMALS CLINICAL STUDIES IV
Code: BVC 3852
NQF Level: 8
Contact Hours: 7 hours / week of integrated learning and instruction (Lectures and Practicals) each semester
NQF Credits: 16
Pre-requisites: BVC 3811, BVC 3812, BVM 3821
Co-Requisites: BVC3851
Compulsory / Elective: Compulsory
Semester Offered: 2

Module Content:
This is a multi-disciplinary module where applied clinical pathology, diagnostic imaging, anaesthesiology, medicine and surgery are integrated to equip the student with a holistic approach to the diagnosis and treatment of companion animals including cage birds. Topics to be covered include oncology, pathophysiology and diseases of the respiratory and cardiovascular systems. Emergency Medicine and critical care including triage, shock, sepsis, systemic inflammatory response syndrome, multiple organ dysfunction syndrome, and traumatology as well as monitoring the critical care patient will be included.

Course material will provide students with an understanding of the pathophysiology, diagnosis, clinical management and best medical or surgical treatment options of diseases and trauma affecting various organ systems.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 7 marked practical assessments
Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%)

BVM 3832 THERIOGENOLOGY II

Module Title: THERIOGENOLOGY II
Code: BVM 3832
NQF Level: 8
Contact Hours: 5 hours / 14 days of integrated learning and instruction (Lectures and Practicals)
NQF Credits: 8
Co-requisites: BVM3871
Compulsory / Elective: Compulsory
Semester Offered: 2

Module Content:
The module covers principles of assisted animal reproduction; breeding soundness examination, semen collection and processing, reproductive cycle synchronization, artificial insemination, embryo transfer, methods of sperm and embryo sexing and cryo-preservation.

Assessment Strategies:
Continuous Assessment: Minimum 2 theory assessments and at least 2 marked practical assessments
Examination: 1 x 2hr practical examination (25%) and 1 x 2hr theory paper (75%)

BVM 3880 VETERINARY PROFESSIONAL SKILLS

Module Title: VETERINARY PROFESSIONAL SKILLS
Code: BVM 3880
NQF Level: 8
Contact Hours: Lectures: 2 x 1hr lecture per week
NQF Credits: 8
Pre-requisites: None
Compulsory / Elective: Compulsory
Semester Offered: 1 & 2

Module Content:
Concepts of animal health consultation; stress and its management; effective communication skills (basic communication and consultation skills based on a predominantly relationship-centred style, being able to apply and identify effective clinical interviewing techniques); business budgeting skills, identifying sources and symptoms of stress and practicing stress management techniques). This module also covers business management including personal and business finance, marketing and teamwork, communication and professionalism. Staff management and budgeting, and control of finances will be a major section of this module. Veterinary ethics, interpersonal communication, interpersonal skills as well as client relationship will also be discussed.

Assessment Strategies:
Continuous Assessment: 100 % (Minimum 3 assessments).

L.10.6 SIXTH YEAR MODULES

BVC 3890 CLINICAL ROTATION

Module Title:	CLINICAL ROTATION
Code:	BVC 3890
NQF Level:	8
Contact Hours:	45 weeks starting December of the fifth year
NQF Credits:	140
Prerequisites:	None
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1 & 2

Module contents
Each student will be required to successfully complete a number of clinical rotations including core or compulsory rotations and elective rotations, as per the individual schedule prepared for each student.

Assessment Strategies:
Continuous assessment: Compulsory submission of completed clinical skills logbook. Marking rubrics designed for each rotation (subminimum for each rotation 40%).

Examination:
4 theory papers:
1. Companion Animal Clinical Studies (canine, feline, equine, cage birds; incorporating medicine, surgery, anaesthesiology, pharmacology, toxicology, infectious diseases, theriogenology, nutrition, diagnostic imaging, parasitology, clinical pathology, animal welfare)
2. Production Animal Clinical Studies (bovine, ovine, caprine, porcine, poultry, fish, bees and wildlife; incorporating medicine, surgery, anaesthesiology, theriogenology, pharmacology, nutrition and pasture science, toxicology, infectious diseases, diagnostic imaging, parasitology, herd health, clinical pathology, animal welfare)
3. VPH and Pathology (all species, incorporating Veterinary Public Health, food safety systems, general pathology, systemic pathology, animal welfare and ethology, histology and histopathology, toxicology, parasitology)
4. Epidemiology and Regulatory Medicine (all species; incorporating epidemiology, Policy, Legislation and Juris Prudence, veterinary professional skills, infectious diseases, toxicology, herd health, State and Private vet practice)

Examination: 4 practical exams:
1. Companion Animal: clinical case workup of a canine or feline and equine patient, and panhysterectomy of a bitch,
2. Production Animal: clinical case workup of a ruminant patient, and Pregnancy diagnosis of 3 cows
3. VPH and Pathology: diagnosis or opinion/judgement of fresh and preserved post mortem samples (gross and microscopic)

Subminimum for each paper, theory and practical: 40%.
Final calculation: 4 Theory exam papers (50% of final mark); 3 practical exams (50% of final mark)

M. M. SC. RANGELAND RESOURCES AND MANAGEMENT [17MSRR]

M.1 ADMISSION REQUIREMENTS

M.1.1 The University of Namibia general regulations regarding admission of students to Master's Degree programmes shall apply.

M.1.2 Notwithstanding the above, students wishing to enrol for this programme must be in possession of a good undergraduate Bachelor of Science degree in Agriculture, Biology, Life Sciences, or related field from a recognized and accredited institution of higher learning.

M.2 ASSESSMENT

The following were adopted to ensure high standards and competitive degree quality:

M.2.1 A 3-hour theory examination at the end of each course;

M.2.2 A pass mark of 60% for all courses, including the thesis;

M.2.3 A weighting of 50:50 for continuous assessment (CA) and the final examination;

M.2.4 At least 3 different continuous assessments for each course for core courses and 5 for generic courses;

M.2.5 Only students with an attendance record of 80% of all course activities (excluding continuous assessment activities) and a minimum continuous assessment grade of 40% can write the final examination;

M.2.6 A supplementary examination may be conducted in cases where a student has obtained a fail mark of 45 – 49% (hereinafter referred to as marginal fail) in the Regular Examinations. A student who fails to get the required passing marks after the supplementary examination will have to repeat the failed course in the subsequent year.

M.2.7 A student can remain registered for a maximum of 4 years.

M.2.8 Student will only be awarded M.Sc. degree in Rangeland Resources Management upon completion of all required courses with a pass mark of 60% or higher, including the thesis component.

M.3 DEGREE STRUCTURE

The following will be the structure of the degree.

M.3.1 The degree name will be MSc. Rangeland Resources Management and will be housed and taught in the Department of Animal Science at the University of Namibia.

M.3.2 It will be a two-year fulltime program with a 50:50 weighting of course work to research. The program is based at Neudamm Campus. Classes/Lecturing will take place during daytime.

M.3.3 Coursework will be covered over two semesters in the first year while research and thesis work will be done in the second year.

M.3.4 There will be a maximum of 15 students per intake (minimum 5 students) and new intakes will be done once in two years.

M.3.5 The degree course work will comprise of: 8 compulsory core courses, 2 (out of 7) elective core courses and 2 compulsory generic courses. Graduation requires the completion of minimum 240 credits in line with NQA guidelines.

M.3.6 Core courses, both compulsory and elective will be equally weighted at 12 credits each, equivalent to 40 hours, while generic courses will each be weighted at 16 credits, equivalent to 64 hours.

M.3.7 Each core course will run over a 4-week block, while the generic courses will run over 28 weeks, across the two semesters.

M.3.8 Six core courses will be taught each semester with a week's break between the core teaching blocks.

M.3.9 Core course examinations will be written immediately after the course, during the inter-block break.

M.3.10 To counter the anticipated time-tabling problem regarding the 7 elective courses, there will be restricted possible course combinations and sequencing in the student's degree plan.

M.4 TEACHING MODE

This will include; lectures, field work, discussion seminars, case studies, group projects etc.

M.5 THESIS COMPONENT

Only students who have successfully passed all coursework shall be allowed to undertake research in Rangeland and Resources Management. Each student is required to propose a topic and write a proposal for research before the end of the first year. The official registration for the thesis will depend upon acceptance of her/ his proposal by Faculty Postgraduate Studies Committee.
Two (2) supervisors are recommended per student and the main supervisor must be from UNAM and must be a PhD holder. All theses must be externally examined.

M.6 PROGRAMME SCHEDULE

FIRST YEAR

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	COMPULSORY/ ELECTIVE
Semester 1						
UAE 5819	Academic Writing for Postgraduate Students	8	04/56	0	16	Compulsory
ASC 5900	Research/ Exp Design & Analysis	9	2	0.3	8	Compulsory
ASC 5920	Geographic Info Systems & Remote Sensing	9	1.1	1.2	8	Compulsory
ASC 5981	Intro Integrated Resource Management	9	7/w	3/w	12	Compulsory
ASC 5991	Rangeland Ecosystem Structure & Function	9	7/w	3/w	12	Compulsory
ASD 5981	Soil Dynamics	9	7/w	3/w	12	Elective
ASW 5981	Water Dynamics	9	7/w	3/w	12	Elective
ASE 5981	Environmental Physiology	9	7/w	3/w	12	Elective
ASL 5981	Land Use Planning	9	7/w	3/w	12	Elective
ASF 5981	Fodder Flow	9	7/w	3/w	12	Elective
ASR 5981	Rangeland Management	9	7/w	3/w	12	Compulsory
TOTAL SEMESTER 1 CREDITS					128	
Semester 2						
ASC 5900	Research/ Exp Design & Analysis	9	2	0.3	8	Compulsory
ASC 5920	Geographic Info Systems & Remote Sensing	9	1.1	1.2	8	Compulsory
ASC 5992	Rangeland Degradation and Its Mitigation	9	7/w	3/w	12	Compulsory
ASN 5982	Nutrition of Foraging Animals	9	7/w	3/w	12	Compulsory
ASS 5982	Sustainable Livelihoods	9	7/w	3/w	12	Compulsory
ASR 5982	Range Biodiversity and Conservation	9	7/w	3/w	12	Compulsory
ASC 5982	Wildlife Ecology & Management	9	7/w	3/w	12	Elective
ASE 5982	Natural Resource Economics	9	7/w	3/w	12	Elective
ASP 5982	Natural Resource Policies	9	7/w	3/w	12	Elective
TOTAL SEMESTRER 2 CREDITS					116	
TOTAL FIRST YEAR CREDITS					244	

SECOND YEAR				
MODULE CODE	MODULE TITLE	NQF LEVEL	CREDITS	COMPULSORY/ ELECTIVE
Semester 1				
ASC 5910	Research Project / Thesis	9		Compulsory
Semester 2				
ASC 5910	Research Project / Thesis	9		Compulsory
TOTAL SECOND YEAR CREDITS			128	
TOTALS			340	

M.7 MODULE DESCRIPTORS

M.7.1 FIRST YEAR MODULES

AASC 5900: RESEARCH / EXPERIMENTAL DESIGN AND ANLYSIS

Module Title	RESEARCH / EXPERIMENTAL DESIGN AND ANALYSIS
Code	AASC 5900
NQA Level	9
Practicals/week:	28 weeks (64 Contact Hours) compulsory
Credits	16
Modules Assessment:	Assessment: CA [50%] at least 5 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	

Module Content:

A: Social research methods: Research paradigms and associated methodologies; positivism, phenomenology and critical theory: A critical difference between quantitative and qualitative research in terms of the nature of their empirical data should be discussed, purpose and nature of research, a basic overview of research design and methodology. Survey research; define and explain the purpose and describe the types, survey research cycle, discuss the advantages and challenges of the research strategy and methodology and the role of indicators, describe data gathering techniques, instruments analysis and presentation. Participatory rural appraisal (PRA); define, and explain the purpose and describe the types of PRA, PRA cycle, research strategy and methodology, the advantages and value, challenges and shortfalls of the method. The research proposal: define the research proposal, its purpose and the steps involved in writing it. Clearly and fully describe the layout and contents of the research proposal. Describe how research proposals should be evaluated, and the importance of that step. Scientific communication Describe what should be contained in a research report. Explain the importance of an oral presentation, and how it should be prepared and done

B: Research/Experimental Design and Analysis Review of basic analytical techniques: review basic concepts of graphical and numerical data summary i.e. how to summarize data in form of tables and graphs, how to calculate measures of central tendency and measures of dispersion, merits and demerits of each of the measures of central tendency and measures of dispersion, the ideas of probability and confidence intervals in relation to statements made about results of experiments and surveys; the importance of the normal, F-distribution and t-distribution in statistics; the sampling distribution of the mean and hypothesis testing and introduce the concepts of sampling error and standard error and calculation of confidence intervals. Standard Experimental Designs; Completely randomized design; show how to design a simple experiment using the principles of replication, randomization and local control; analysis of variance (ANOVA), results of one-way ANOVA, compare treatment means, and how to present the results. Discuss the advantages and disadvantages of the design. Randomized block design, principle of blocking including advantages and disadvantages; latin square designs and its usefulness; factorial experiments. Comparison of treatment means: describe the most important procedures for mean comparisons and when they should be used. e.g. LSD, DMRT, Orthogonal contrasts. Explain the difference between comparison-wise and experiment-wise error rates, discuss the advantages and disadvantages of the most popular multiple comparison tests. Regression and correlation: the concept of dependent and independent variables, the uses and abuses of the simple and multiple regression; calculate and interpret correlation coefficient and coefficient of determination; the concept of least squares point estimates and least squares regression line and how to test hypothesis about a regression line; polynomial regression (polynomial fitting), types of curves e.g. exponential growth curves, logistic curves. Non Parametric Statistics: Introduce alternative tests to the parametric tests used in previous units, advantages and

disadvantages of non-parametric tests. Multivariate statistics: introduction to the nature of multivariate data and the range of interdependence techniques available for exploring and analyzing multivariate data sets, the concept of classification and explain analyses using the different cluster analysis techniques; the concept of gradient analysis using ordination techniques, indirect gradient analysis (e.g. Principal Components Analysis, Detrended Correspondence Analysis) and direct gradient analysis (e.g. Canonical Correspondence Analysis) with practical examples. Other ordination approaches can also be covered, multivariate Statistical Analysis software packages (e.g. CANOCO for Windows, TWINSPAN for Windows, PC-ORD for Windows, NMMDS, DECORANA) and demonstrates how they are used.

AASC 5920: GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING

Module Title:	GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING
Code	AASC5920
NQA Level	9
Contact Hours:	28 weeks (64 Contact Hours) compulsory
Credits	16
Modules Assessment:	Assessment: CA [50%] at least 5 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Ccontent.

Basic introduction to the course GIS/RS in Rangeland Resources Management: The fundamentals of GIS and the components of a GIS. The nature of geographic data, and geo- referencing. Generalization, abstraction and metadata. Data models and data collection. Modeling the real world in a GIS environment. Review the main methods of GIS data capture and transfer; introduce essential practical management issues. Remote Sensing. Geographic query and analysis; turning data into information; basic introduction to spatial analysis; measurement, including algorithms to determine length, areas, shapes, slopes, and other properties of objects important for rangeland resources management. The concept of environment, natural resources, demography and land use. Major environmental concerns including pollution, soil degradation and crop and livestock production, effects of agrochemicals, desertification and methods of control, natural and man-made hazards, human population growth, industrialization, urbanization, energy sources, waste management and recycling. Ecosystems management and modeling of habitat change.

AASC 5981: INTRODUCTION TO INTEGRATED RESOURCES MANAGEMENT

Module Title	INTRODUCTION TO INTERGRATED RESOURCES MANAGEMENT
Code	AASC5981
NQA Level	9
Lecturers /week:	40 (4 weeks) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:

Ecosystem approach: principles to ecosystem management; ecosystem structure, functions and integrity; ecosystems connectivity; scales in ecosystem management, e.g. basin management; application of Convention on Biology Diversity and Ecosystem Approach Toolkit. Dealing with complexity and dynamism; Socio-ecological system components, behavior and interactions; scales in socio – ecology system. Institutions of Natural Resource Management: institutional arrangements in governing natural resources; decision making process, trade-offs and competing interests; conflict resolution mechanisms, challenges and best practices; policy responses in the southern African region regarding Natural Resource Management (NRM), property rights, legal frameworks, regulations regarding amongst others: pricing and subsidies, markets, Community Based Natural Resources Management (CBNRM). Adaptive management and action research: shifting paradigm from seeking solutions to generating learning opportunities to continuously improve ecosystem management; integration of formal scientific knowledge and local knowledge in an adaptive management framework; approaches to engage interest groups as partners in action research; formulation of action research; measuring natural resource performance. Knowledge management: partnerships in multi-stakeholder issues; data management (spatially reference data), including local knowledge; information sharing approaches aiming to achieve shared understanding of system properties and change; organization/institutional learning. Systems analysis tools: models as management tools; application of modeling to natural resource management; data bases, GIS; decision and negotiation support tools.

AASC 5991: RANGELAND ECOSYSTEM STRUCTURE AND FUNCTION

Module Title	RANGELAND ECOSYSTEM STRUCTURE AND FUNCTION
Code	AASC5991
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	none

Module Content:

This course aims at describing the general structure and processes that are characteristic of Southern African rangelands. Southern African rangelands are a basic resource for the survival of the majority of Southern African rural population. Proper and sustainable management of these rangelands require defining these rangelands in Southern Africa and the processes that drive them. Types and distributions of major rangeland types will be described to illustrate the diversity of structures, including floristically and including the faunal species associated with the rangelands.

Rangeland ecosystem structure consists of the soil, plants, animals and invertebrates. Foraging activities of rangeland herbivores play an important role on the integral functioning of rangelands. These effects will be discussed to lay the foundation on principles and practices associated with the rangelands. Changes occurring on rangelands, the causes and models used to describe these changes as well as implications of understanding and describing rangeland dynamics on rangeland management.

Defining Southern African rangelands; understand the significance of the different scale and levels of organization in rangeland description; understand the major Southern African biomes and their determinants; understand the role of grazing and grazing management on rangeland ecosystem integrity as well as understanding of rangeland vegetation dynamics models.

AASD 5981: SOIL DYNAMICS

Module Title	SOIL DYNAMICS
Code	AASD5981
NQA Level	9
Standards Competencies	N/A
Contact Hours:	4 weeks (40 Contact Hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	none

Module Content:

Soil chemical processes: discuss the dynamics of nutrient cycling in the context of the impacts of rangeland management practices on the rates and directions of the various processes involved, describe surface functional groups, sorption processes and exchange reactions in soils, quantity-intensity relationships in soils, discuss redox chemistry and soil acidity and alkalinity and their relevance in soil management. Comparative analyses of the various chemical processes across different soil types and climatic gradients, implication of rangeland management practices on soil chemical properties and soil and processes. Soil organic matter (SOM): biophysiochemical processes in soils (e.g. decomposition, properties of SOM,) and their importance in rangeland management. Impacts of various management practices on the nitrogen cycle. Comparative analyses of the various processes involved across different soil types and climatic gradients. Implications of rangeland management practices on soil biophysiochemical properties and soil processes. Soil water, the holding capacity, measurements, and flow in the soil. Inferences should be made on issues related to soil erosion, irrigation, drainage and floods as the result of improper management strategies. Water movement in soil (Darcy's law of water flow), soil morphology; and soil conservation.

AASW 5981: WATER DYNAMICS

Module Title	WATER DYNAMICS
Code	AASW 5981
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	none

Module Content:

Water cycle: components of the water cycle and the fluxes of the planet's water, implications on the management of plants, animals and the land as a whole. Climate, drought, flood, water quantity and quality (both surface and ground water). Water quality standards used in the southern African region should be explained, especially the one used by the South African River Health Program such as SASS5 (or similar).The need to continuously monitor water quality in rangeland ecosystems must be explained – how and why it is done. Watershed management, watershed water balance, watershed water capture, storage and release. Water harvesting and utilization especially given that much of southern Africa is semi-arid to arid. Water pollution, sources and types. Policies and legislation addressing water pollution must be discussed with particular reference to rangeland management. Ways of preventing and mitigating water pollution.

AASE 5981: ENVIRONMENTAL PHYSIOLOGY

Module Title	ENVIRONMENTAL PHYSIOLOGY
Code	AASE 5981
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	none

Module Content:

Introduction to physiology of foraging animals: cell structure and function (The significance of knowledge of cell structure and its functions in understanding physiological process). Osmo-regulation and excretion, circulating body fluids and functions. Respiratory system. Climatic Physiology and temperature regulation: regulation of body temperatures. Adjustment to ambient temperature variation; cold, response to heat. Morphological and anatomical features relevant to temperature regulation. Body conformation, limits of temperature regulation in hot and cold. Water and animal physiology: distribution of body water; water balance; Photoperiodism: seasonal physiological change; allometry of food intake (energy requirements, body size); genetic adaptation; reproductive and digestive physiology: importance in terms of production assessment.

AASL 5981: LAND USE PLANNING

Module Title	LAND USE PLANNING
Code	AASL 5981
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	none

Module Content:

Land use planning; familiarize students with concepts of existing land use planning guidelines e.g. for land evaluation, agro-ecological zoning and discuss their application in the Namibia context; environmental sustainability, criteria, current land use cover and land cover change detection; land use planning procedure, participatory methods for local and regional land use planning; techniques of resource survey and mapping, food agriculture organization (FAO) framework and guidelines for land evaluation; land capability classification; agro-ecological zoning methodology; importance of GIS and remote sensing in land use planning and image processing; decision support tools in local-level land use planning. Land tenure: Land tenure regimes governing land use in southern Africa; opportunities and challenges underlying tenure systems; land rights and tenure arrangements.

AASF 5981: FODDER FLOW

Module Title	FODDER FLOW
Code	AASF5981
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	none

Module Content:

Fodder production from rangelands: Discuss the importance of natural grasslands as major sources of nutrients for range animals including wild life; the nutritional limitations of utilizing natural grasslands and appropriate mechanisms for improving their nutritional quality applicable to range communities especially pastoralists; overview of the different pasture management practices to improve productivity of native pasture lands, livestock productivity, animal husbandry practices and disease control; the importance and methods of reseeding and over sowing; methods of establishing cultivated pastures and conditions, choice of plant species and management of cultivated pastures.

Management of sown and improved tropical legume pastures: Explain the concept of incorporating forage legumes into natural grasslands and their role in providing quality fodder to range animals while preserving the natural resource base; the factors which affect and favor legumes in grass/legume pastures, overview of fertilizer use to improve pasture productivity and factors limiting their use in tropical rangelands especially in Africa; explain the principles and importance of pasture biomass assessment and its application in pasture management, soil surface protection and erosion; Utilization and conservation of forage: Explain the importance of fodder utilization and conservation, the different methods of forage conservation e.g. standing hay or differed feed, hay, silage and haulage.

Fodder flow planning: strategies for drought feeding: Explain the nutrition aspects of drought feeding and the strategies to be adopted for different agro-ecological zones; discuss the different strategies for feeding range animals in periods of severe feed shortages (drought feeding); the strategy for drought feeding based on molasses and other supplementary feed stuffs.

AASR 5981: RANGELAND MANAGEMENT

Module Title:	RANGELAND MANAGEMENT
Code:	AASR 5981
NQF Level:	9
Contact Hours:	4 weeks (40 Contact Hours) Compulsory
Credits:	12
Module Assessment:	CA 50%: at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations) Examination 50%: One 3 hrs written examination paper
Prerequisites:	None

Module Content:

Students will be exposed to topics such as Eco-physiology of southern Africa, rangeland herbivorous interaction, rangeland management, carrying capacity, current land issues, range monitoring and evaluation, sustainable use of rangeland and drought mitigation strategies, problems of bush/weed encroachment on rangeland pastures and methods of control; grazing management and methods for optimum utilization of range pastures, the importance of fire in the management of range forages and as a tool for control of weeds. review the different methods of pasture assessment emphasizing tropical rangeland pastures, e.g. pasture yield, pasture composition, estimating number, frequency and vegetation cover, basal area of a pasture, pasture structure, trees and shrubs. Students will also be exposed to practical activities at the farm at Neudamm and elsewhere within the country.

AASC 5982: WILDLIFE ECOLOGY AND MANAGEMENT

Module Title	WILDLIFE ECOLOGY AND MANAGEMENT
Code	AASC 5982
NQA Level	9
Contact Hours:	40 contact hours (4 weeks) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	none

Module Content:
Population dynamics: define wildlife and wildlife management and its importance; the factors which influence fluctuations of animal populations in the wild; the patterns of growth of animal populations and the differential equations which describe the various patterns (logistic, geometric and exponential); explain the need for reliable information on population size and reproductive rates; the inherent qualities/properties of wildlife populations: rate of increase, age structure, lifespan, sex ratio, fecundity/natality and mortality; interspecific dynamics, intraspecific dynamics, territoriality and home range, dispersal patterns and migrations; the mechanisms of population regulation, including density-dependent and density-independent factors (and how these can be extrinsic or intrinsic). Wildlife nutrition and water requirements: Wildlife feeding and nutrition; influence of variations in gut anatomies (including feeding classes), body sizes and physiology on nutritional requirements. Counting wild animals: Emphasize the importance of collecting data on animal counts in wildlife management, pros and cons of the various methods applied in animal censuses; discuss home range, territories and social organization: the use of some statistical models to characterize home ranges of animals such as minimum convex polygon model, density estimation models (bivariate, normal, harmonic mean, and kernel), the importance of radio telemetry as a tool in many modern studies of animal behaviour, ecology, management and conservation; home range utilization (intensity of use) by wild animals and the concept of the 'centre of activity; define a 'territory' and compare and contrast a home range and territorial behaviour. Define a 'social animal' and social organization in wild animal populations; social behaviour.
Wildlife utilization and conservation systems in southern Africa: Define wildlife utilization/harvesting and explain the purposes including the concept of maximum sustained yield (MSY) and optimum sustained production (OSP), culling controversies, conservation and the causes of wildlife extinctions considered in the issues such as: types of protected area systems and their functions, ecosystem-based vs species-based approaches, influence of size of protected area, minimum viable population concept and population viability analysis, importance and effects of corridors, culling in parks and reserves and its controversies, conservation outside parks and reserves, and community-based wildlife management initiatives in southern Africa, international conservation issues including IUCN Red Data Books, the role of CITES, etc.

AASC 5992: RANGELAND DEGRADATION AND ITS MITIGATION

Module Title	RANGELAND DEGRADATION AND ITS MITIGATION
Code	AASC 5992
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination
CA:	50%
Exam:	50%
Prerequisites	none

Module Content:
Define rangeland degradation; causes of rangeland degradation; indicators of rangeland degradation; state of rangeland degradation in Sub-Saharan Africa; mitigating rangeland degradation; rangeland restoration and rehabilitation and reference ecosystem; the ecological trajectory; challenges and opportunities.

AASN 5982: NUTRITION OF FORAGING ANIMALS

Module Title	NUTRITION OF FORAGING ANIMALS
Code	AASN 5982
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	none

Module Content:
Nutritional diversity of rangeland forage. Define the term rangeland in its broad sense and give an overview of the feeding and nutrition of animal; discuss the species and diversity of range forages and their nutritive value. Discuss biotic factors including plants anatomy, differences in plant parts, plant age, stage of growth; and biotic factors including season of growth, range site conditions, stocking rate, livestock and wildlife species. Animal foraging behavior and diet selection: Diet selection and foraging behavior; wildlife feeding nutrition; factors affecting food availability, quantity and quality. Review the classification of range forage base, on their functional attributes and the types of foods eaten including bulk/ roughages grazers, concentrate selectors and intermediate feeders. Factors which influence diet selection of foraging animals. Determination of the amounts and quality of nutrients derived from grazing animal's diets. Foraging behavior of range animals including foraging tactics of range animals. Establish

forage quality effects on foraging behavior of animals; Present and discuss the inherent factors which affect diet selection by foraging animals.

Range land animal nutritional requirements: The concept of animal nutritional requirements to support metabolic activities for normal health and vigor, growth rate, reproduction and or normal lactation levels; the roles and requirements of the most important nutrients essential for the metabolic activities of foraging animals. Discuss the three protein fractions when considering the protein requirements , soil and plant factors which affect mineral content of pastures; the important major minerals required for grazing stock production , role of anti – nutritional factors and their effects on nutritive value of forages.

AASS 5982: SUSTAINABLE LIVELIHOODS

Module Title	SUSTAINABLE LIVELIHOODS
Code	AASS 5982
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	

Module Content:
Land, agriculture, poverty and rural livelihoods in Africa – an introduction on food security, poverty and sustainable development; Rangeland Resource Management (RRM): Services and Markets; Describe issues that revolve around effective rangeland resources management e.g. service provision, research, communication and interaction between service providers and clients, refinements. Cross-cutting RRM including issues such as decentralization, governance and institution building, impacts of HIV/AIDS on RRM, engendering rangeland resource management. Land and agrarian reform; discuss technical information and background on the history of land and agrarian reform and introduce models currently implemented in Namibia, South Africa and Mozambique, supplemented by other relevant examples from the region. Sustainable Livelihoods Framework. Hands on application of the livelihoods framework.

AASR 5982: RANGE BIODIVERSDITY AND CONSERVATION

Module Title	RANGE BIODIVERSITY AND CONSERVATION
Code	AASR 5982
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	none

Module Content:
Inventory, assessment and monitoring of rangeland biodiversity with particular emphasis on rangeland; review and discuss inventory assessment and monitoring approaches; discuss the importance of red data lists, their advantages and disadvantages. Valuation of rangeland biodiversity; categories of biodiversity, economic evaluation of and applicability of various methods and approaches to rangeland resources. Bio-systematic considerations for conservation of rangeland biodiversity; ecological and taxonomic views of biodiversity and how they are linked. Conservation strategies and current issues. Conservation genetics: principles and procedures underlying various modern techniques of measuring genetic diversity; interpretation and use in conservation genetics. Local and international conventions on biodiversity (convention on biological diversity, United Nations Convention to Combat Desertification (UNCCD), Convention on International Trade on Endangered Species of Fauna and Flora (CITES).

AASE 5982: NATURAL RESOURCE ECONOMICS

Module Title	NATURAL RESOURCE ECONOMICS
Code	AASE5982
NQA Level	9
Lecturers /week:	4 weeks (40 Contact Hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%

Exam: 50%
Prerequisites none
Module Content:
Introduction to natural resources economics, environmental economics and agricultural economics: economic value of rangeland natural resources, use and non-use values, economic valuation of range resources including biodiversity, species and habitats, ecosystem function, conservation, water, soils, incentives and appropriation of value-local and global. RM and NRM relevant applications: cases from southern Africa; natural resources accounts: Botswana, Namibia, raising local natural resource benefits and lowering local opportunity costs: CBNRM, assessing the economic impact of desertification: Namibia, differential land use, land taxation in Namibia, poverty rights and common-pool resources: examples and lessons learnt in southern Africa and elsewhere. Introduction to some analytical tools, cost effectiveness analysis, benefits and costs, supply and demand, economic efficiency and markets. National budgets, international financing, aid: strategy overviews; financing RRM: public and private investments, budgeting, Government budgets, aid, cooperation and trade. Current RRM relevant economic debates: top hits; food security, land reform, alternative land uses: weighing the economic-social and environmental benefits and value, water pricing, valuation of protected areas, access and benefit sharing: how to unlock the potential of natural resources, international trade and subsidies: how does the global economy affect RRM in southern Africa and international aid: What is needed and what is useful.

AASP 5982: NATURAL RESOURCE POLICIES

Module Title	NATURAL RESOURCE POLICIES
Code	AASP5982
NQA Level	9
Lecturers /week:	4 weeks (40 contact hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	none

Module Content:
Policy formulation, analysis and implementation. The price linkage: fiscal expenditures; support for agriculture; improving the incomes of the rural poor. Gender and rural development: the key issues for discussion here are the deeply rooted traditional codes of condition, division of labor and unfair inheritance laws. Principal aspects of a legal framework; Policy analysis and implementation; agricultural policies and their impact on other natural resources in the economy; competitiveness of developing countries' exports in the world market; the existence of mega tariffs of 200- 300 % on agricultural commodities in developed countries; trade liberalization and the reallocation of resources towards a country's comparative advantage

UAE 5819: ACADEMIC WRITING FOR POSTGRADUATE STUDENTS

Module Title:	ACADEMIC WRITING FOR POST GRADUATE STUDENTS
Code:	UAE5819
NQF Level:	9
Contact hours:	4 lecture periods per week and 1 practical session per week for 14 weeks
Credits:	16
Module Assessment:	CA: (1 x 3 hour exam paper)
Prerequisites:	Must be a postgraduate student.

Module Content:
This module is a post-graduate course designed to empower students with skills and knowledge to access and critique academic sources and to synthesize information from these sources to assist them in the substantiation and development of their own claims when writing an academic paper in their respective fields of specialization. Additionally, this course will empower students with the capacity to undertake the challenges of academic writing by exposing them to the different rhetorical and stylistic elements typical of academic texts. Finally, students will be introduced to the American Psychological Association (APA) writing style and will be equipped with the necessary skills to format an academic paper in APA style.

M.7.2 SECOND YEAR: THESIS COMPONENT

AASC 6910: RESEARCH PROJECT / THESIS

Module Title	RESEARCH PROJECT/THESIS
Code	AASC 6210
NQA Level	9
Contact Hours:	Second Year; compulsory
Credits	128

Modules Assessment:

Thesis component

Only students who have successfully passed all coursework shall be allowed to undertake research in Range Resource Management. Each student is required to propose a topic and write a proposal for research before the end of the first year. The official registration for the thesis will depend upon acceptance of her/ his proposal by Postgraduate Students Committee.

Two (2) supervisors are recommended per student and the main supervisor must be from UNAM and must be a PhD holder. All theses must be externally examined.

Prerequisites A pass in all coursework modules

Module Content:

A student, who has successfully completed the coursework phase, shall undertake research in an approved topic in rangeland management. A student must submit a research proposal in the second semester of the first academic year. A student can only officially register for the second year after acceptance of his/her research proposal by the Postgraduate Studies Committee.

The student under the guidance of the two academic advisors will collect and analyze data, write a thesis and make a presentation of the research findings before staff and students of the Faculty. The two academic advisors will assist the candidate to ensure integrity, correctness and completeness of the research. After the thesis has been examined by the two supervisors, it will be sent for further examination by an external assessor. The candidate will be required to defend the thesis before a panel of examiners according to the Rules and Regulations of the University of Namibia.

APPENDIX 1: ARTICULATION OF THE NEW DIPLOMA CURRICULUM INTO THE DEGREE PROGRAMME

TABLE 1

ARTICULATION						
					B.Sc. Degree Structure for Diploma Students having completed the new curriculum and joining FANR Degree Programme as of 2012:	
FANR B.Sc. Degree Programme (Agriculture)			New Diploma Agriculture (Neudamm and Ogongo Campus)			
Course Code	Title		Course Code	Title	Course Code	Title
1st Year			1st Year		1st Year	
1st Semester			*1st Semester*		*1st Semester through CES*	
UCLC 3509	Computer Literacy	Exemption through:	UCLC 3509	Computer Literacy		
ULCE 3419	English Communication	Exemption through:	ULEG 2410	English for General Communication		
	and Study Skills					
UCSI 3529	Contemporary Social Issues	Exemption through:	UCSI 3529	Contemporary Social Issues		
ULEA 3519	English for Academic Purposes				ULEA 3519	English for Academic Purposes
SBLG 3411	Introduction to Biology	Exemption through:	AASC 2401	Biology		
SPHY 3401	Physics for Life Sciences I	Exemption through:	AASC2411	Physical Science		
SMAT 3511	Basic Mathematics				SMAT 3511	Basic Mathematics
2nd Semester			*2nd Semester*		*2nd Semester through CES*	
SCHM 3532	Chemistry for Life Sciences	Exemption through:	ACSC 2512	Soil Science and		
			ACSC 2601	Water Management + Soil Conservation		
SPHY 3412	Physics for Life Sciences II				SPHY 3412	Physics for Life Sciences II
SBLG 3512	Diversity of Life	Exemption through:	AASC 2401	Biology		
			ACSC 2412	Principles of Crop Production		
			AASC 2502	Applied Animal Breeding		

ARTICULATION

B.Sc. Degree Structure for Diploma Students having completed the new curriculum and joining FANR Degree Programme as of 2012:

FANR B.Sc. Degree Programme (Agriculture)			New Diploma Agriculture (Neudamm and Ogongo Campus)			
Course Code	Title		Course Code	Title	Course Code	Title
			AASC 2411	Physical Science		
SMAT 3512	Precalculus				SMAT 3512	Precalculus
SSTS 3522	Introduction to Statistics				SSTS 3522	Introduction to Statistics
2nd Year			*2nd Year*		*2nd Year*	
1st Semester			*1st Semester*		*1st Semester*	
AGEC 3681	Principles of Microeconomics				AGEC 3681	Principles of Microeconomics
AGEC 3691	Rural Sociology	Exemption through:	AGEC 2422	Communication + Information Systems		
			AGEC 2521	Introduction to Rural Sociology		
			AGEC 2601	Extension Methods		
AASC 3601	Genetics				AASC 3601	Genetics
ACSC 3681	Plant Science	Exemption through:	ACSC 2602	Crop Production and		
			ACSC 2611	Vegetable + Fruit Production		
AFST 3601	Human Nutrition				AFST 3601	Human Nutrition
AFST 3621	General Microbiology				AFST 3621	General Microbiology
2nd Semester			2nd Semester		2nd Semester	
AAEN 3602	Agricultural Engineering	Exemption through:	ACSC 2502	Farm Technology I and		
			ACSC 2612	Farm Technology II		
AGEC 3682	Production Economics				AGEC 3682	Production Economics
AGEC 3692	Principles of Macroeconomics				AGEC 3692	Principles of Macroeconomics

ARTICULATION					B.Sc. Degree Structure for Diploma Students having completed the new curriculum and joining FANR Degree Programme as of 2012:	
FANR B.Sc. Degree Programme (Agriculture)			New Diploma Agriculture (Neudamm and Ogongo Campus)			
Course Code	Title		Course Code	Title	Course Code	Title
AASC 3612	Biochemistry				AASC 3612	Biochemistry
AASC 3602	Livestock Production Systems	Exemption through:	AASC 2502	Applied Animal Breeding and		
			AASC 2611	Intensive Animal Production and		
			AASC 2612	Extensive Animal Production		
ACSC 3682	Agronomy	Exemption through:	ACSC 2602	Crop Production and		
			ACSC 2611	Vegetable + Fruit Production		
AFST 3602	Food Technology				AFST 3602	Food Technology

TABLE 2

ARTICULATION						
					B.Sc Degree Structure for Diploma Students	
					having completed the new curriculum and	
					joining the FANR Degree Programme as of 2012:	
FANR B.Sc. Degree Programme (Natural Resources)			New Diploma in Natural Resource Management (Ogongo Campus)			
Course Code	Title		Course Code	Title	Course Code	Title
1st Year			1st Year		1st Year	
1st Semester			*1st Semester*		*1st Semester through CES*	
UCLC 3409	Computer Literacy	Exemption through:	UCLC 3409	Computer Literacy		
ULCE 3419	English Communication	Exemption through:	ULEG 2410	English for General Communication		
	and Study Skills					
UCSI 3429	Contemporary Social Issues	Exemption through:	UCSI 3429	Contemporary Social Issues		
ULEA 3419	English for Academic Purposes				ULEA 3419	English for Academic Purposes
SBLG 3411	Introduction to Biology	Exemption through:	AASC 2401	Biology		
SPHY 3401	Physics for Life Sciences I	Exemption through:	AASC2411	Physical Science		
SMAT 3511	Basic Mathematics				SMAT 3511	Basic Mathematics
2nd Semester			*2nd Semester*		*2nd Semester through CES*	
SCHM 3532	Chemistry for Life Sciences	Exemption through:	ACSC 2512	Soil Science and		
			ACSC 2601	Water Manag. + Soil Conservation		
SPHY 3412	Physics for Life Sciences II				SPHY 3412	Physics for Life Sciences II
SBLG 3512	Diversity of Life	Exemption through:	AASC 2401	Biology		
			AASC 2411	Physical Science		
			AIES 2511	Plant Entomology and Pathology		
			AIES 2532	Silviculture		

ARTICULATION						
					B.Sc Degree Structure for Diploma Students	
					having completed the new curriculum and	
					joining the FANR Degree Programme as of 2012:	
FANR B.Sc. Degree Programme (Natural Resources)			New Diploma in Natural Resource Management (Ogongo Campus)			
Course Code	Title		Course Code	Title	Course Code	Title
			AIES 2532	Introduction to Agroforestry		
SMAT 3512	Precalculus				SMAT 3512	Precalculus
SSTS 3522	Introduction to Statistics				SSTS 3522	Introduction to Statistics
2nd Year			*2nd Year*		*2nd Year*	
1st Semester			*1st Semester*		*1st Semester*	
AGEC 3681	Principles of Microeconomics				AGEC 3681	Principles of Microeconomics
AGEC 3691	Rural Sociology	Exemption through:	AGEC 2422	Communication + Information Systems		
			AGEC 2521	Introduction to Rural Sociology		
			AGEC 2601	Extension Methods		
AASC 3601	Genetics				AASC 3601	Genetics
AIES	Ecology				AIES	Ecology
AIES 3621	Priciples of Wildlife Management				AIES 3621	Priciples of Wildlife Management
ANRE 3601	Environmental Science	Exemption through:	AIES 2622	Nat. Resource Policies+Administration		
			AIES 2612	Integr. Nat. Resource Mgt.+Planning		
AFST 3621	General Microbiology				AFST 3621	General Microbiology
2nd Semester			2nd Semester		*2nd Semester*	*through CES*
AGEC 3692	Principles of Macroeconomics				AGEC 3692	Principles of Macroeconomics
AASC 3612	Biochemistry				AASC 3612	Biochemistry

ARTICULATION						
					B.Sc Degree Structure for Diploma Students	
					having completed the new curriculum and	
					joining the FANR Degree Programme as of 2012:	
FANR B.Sc. Degree Programme (Natural Resources)			New Diploma in Natural Resource Management (Ogongo Campus)			
Course Code	Title		Course Code	Title	Course Code	Title
AIES 3682	Plant Physiology				AIES 3682	Plant Physiology
AIES 3602	General Soil Science	Exemption through:	ACSC 2512	Soil Science		
			ACSC 2601	Water Management&Soil Conservation		
ANRE 3602	Climatology and Hydrology				ANRE 3602	Climatology and Hydrology
ANRF 3692	Natural Resource Economics	Exemption through:	AIES 2602	Intro. to Natural Resource Economics		

APPENDIX 2: MODULE EQUIVALENTS (Diploma and Degree programmes)

MODULE EQUIVALENTS	
OLD GRN CURRICULUM	NEW UNAM CURRICULUM
1 st YEAR	
Module Code + Title	
ACA 2100 Farm Duties	AACA 2400 Farm Duties
ACB 2111 Computer Skills	UCLC 3409 Computer Literacy
ACB 2121 Mathematics	AGEC 2411 Mathematics + Basic Statistics
ACB 2131 Biology	AASC 2401 Biology
ACB 2141 Chemistry	AASC 2411 Physical Science
ACB 2151 English + Communication Skills	ULEG 2410 English for General Communication

MODULE EQUIVALENTS	
OLD GRN CURRICULUM	NEW UNAM CURRICULUM
ACB 2161 Physics	AASC 2411 Physical Science
AEC 2112 Basic Concepts in Economics and and Management	AGEC 2402 Basic Economics
ASC 2112 Animal Nutrition	AASC 2412 Animal Nutrition and Feeding
ASC 2132 Introduction to Ecology	AIES 2442 General Ecology
CSC 2112 Principles of Crop Production	ACSC 2412 Principles of Crop Production
AEN 2111 Surveying	no equivalent identified
ASC 2111 Animal Anatomy + Physiology	no equivalent identified
ASC 2122 Animal Reproduction + Breeding	no equivalent identified
AEN 2112 Workshop Technology	no equivalent identified
CSC 2122 Soil Science	no equivalent identified

MODULE EQUIVALENTS	
OLD GRN CURRICULUM	NEW UNAM CURRICULUM
2nd YEAR	
Module Code + Title	
ACA 2200 Farm Duties	AACA 2500 Farm Duties
ASC 2211 Range Management I	AASC 2511 Range Management
ASC 2221 Animal Health I	AASC 2512 Applied Animal Health
CSC 2211 Crop Protection	ACSC 2511 Crop Protection
NRO 2211 Introduction to Agroforestry	AIES 2531 Introduction to Agroforestry
AEN 2211 Farm Power + Machinery	ACSC 2502 Farm Technology I
AEC 2221 Research Methodology	AGEC 2502 Introduction to Social Research Methods
AEC 2211 Introduction to Extension	no equivalent identified
AEC 2212 Financial Management	AGEC 2501 Financial Management
AEC 2222 Indigenous Resource Management and Rural Sociology	AGEC 2521 Introduction to Rural Sociology
ASC 2212 Range Management II	AASC 2511 Range Management
ASC 2222 Animal Health II	AASC 2512 Applied Animal Health
ASC 2232 Small Ruminant Production	no equivalent identified
ASC 2242 Dairy Production	no equivalent identified
CSC 2212 Vegetable + Fruit Production	no equivalent identified
AEN 2212 Land Use Planning	no equivalent identified

MODULE EQUIVALENTS	
OLD GRN CURRICULUM	NEW UNAM CURRICULUM

MODULE EQUIVALENTS	
OLD GRN CURRICULUM	NEW UNAM CURRICULUM
3rd YEAR	
Module Code + Title	
ACA 2300 Farm Duties	no equivalent identified
AEC 2311 Marketing Policy + Trade	AGEC 2621 Marketing, Trade + Policy
ASC 2311 Beef Production	AASC 2612 Extensive Animal Production
ASC 2321 Pelt + Fibre Production	no equivalent identified
ASC 2331 Pig Production	AASC 2611 Intensive Animal Production
CSC 2311 Field Crops Production	ACSC 2602 Crop Production
AEN 2311 Animal Draft Power Technology	ACSC 2612 Farm Technology II
AEC 2341 Communications + Information Systems	no equivalent identified
AEN 2321 Soil + Water Management	ACSC 2601 Water Management + Soil Conservation
AEC 2312 Extension System Approaches	AGEC 2601 Extension Methods
AEC 2322 Personnel Management	no equivalent identified
AEC 2332 Introduction to Entrepreneurship	AGEC 2622 Entrepreneurship
AEC 2342 Project Management	AGEC 2602 Project Management
ASC 2312 Ostrich Production	AASC 2611 Intensive Animal Production
ASC 2322 Game Farming	AASC 2602 Game Farming
ASC 2332 Sustainable Resource Management	no equivalent identified
ASC 2342 Poultry Production	no equivalent identified
AEN 2312 Farm Structures	ACSC 2612 Farm Technology II
AEN 2322 Irrigation + Drainage	no equivalent identified


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