Faculty of Agriculture & Natural Resources

Open your mind
FAC ULTY PROSPECTUS 2020

FAC ULTY
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 2020 or any subsequent year.

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

NOTE .................................................................................................................. 2
FACULTY PREAMBLE ...................................................................................... 6
MISSION ........................................................................................................... 6
OBJECTIVES ..................................................................................................... 6
2020 ACADEMIC CALENDAR ............................................................................. 7
DUE DATES FOR THE 2020 ACADEMIC YEAR ............................................... 8
STRUCTURE AND PERSONNEL OF THE FACULTY ........................................ 9
ACADEMIC STAFF BY CAMPUSES AND DEAN OFFICE ................................ 9
ACADEMIC STAFF BY DEPARTMENTS AND SCHOOL .................................. 12
A. REGULATIONS .................................................................................................. 19
   A.1 COURSES OF STUDY ................................................................................. 19
       A.1.1 UNDERGRADUATE PROGRAMMES .................................................. 19
       A.1.2 POSTGRADUATE PROGRAMMES ..................................................... 19
   A.2 GENERAL ADMISSION CRITERIA FOR UNDERGRADUATE PROGRAMMES.. 19
       A.2.1 DIPLOMA PROGRAMMES .................................................................. 19
       A.2.2 UNDERGRADUATE DEGREE PROGRAMMES .................................. 20
   A.3 MATURITY ENTRY SCHEME FOR UNDERGRADUATE DEGREE AND
       DIPLOMA PROGRAMMES ............................................................................. 21
   A.4 CONDUCT OF THE PROGRAMMES .......................................................... 22
   A.5 DURATION OF STUDY (UNDERGRADUATE PROGRAMMES) .................. 22
   A.6 MODULE STRUCTURE AND CODING ...................................................... 23
   A.7 FIELD ATTACHMENT REGULATIONS ..................................................... 23
   A.8 ASSESSMENT ............................................................................................... 23
   A.9. MINIMUM REQUIREMENTS FOR RE-ADMISSION INTO THE FACULTY 24
       A.10 ACADEMIC ADVANCEMENT REGULATIONS ...................................... 25
       A.11 AWARDING OF DIPLOMAS AND DEGREES ........................................ 31
B. DIPLOMA IN AGRICULTURE (Ongogo Campus) [17HDAG] ......................... 32
   B.1 PROGRAMME SCHEDULE ...................................................................... 32
   B.2 MODULE DESCRIPTORS .......................................................................... 33
       B.2.1 FIRST YEAR MODULES ..................................................................... 33
       B.2.2 SECOND YEAR MODULES .................................................................. 36
       B.2.3 THIRD YEAR MODULES ..................................................................... 40
C. DIPLOMA IN NATURAL RESOURCES MANAGEMENT (Ongogo Campus)
   [17HDNR] ........................................................................................................ 47
   C.1 PROGRAMME SCHEDULE ....................................................................... 47
   C.2 MODULE DESCRIPTORS .......................................................................... 48
       C.2.1 FIRST YEAR MODULES ..................................................................... 48
       C.2.2 SECOND YEAR MODULES .................................................................. 52
       C.2.3 THIRD YEAR MODULES ..................................................................... 56
D. DIPLOMA IN ANIMAL HEALTH (17HDAH) – Katima Mwilolo Campus ............... 61
   D.1 PROGRAMME SCHEDULE ...................................................................... 61
   D.2 MODULE DESCRIPTORS .......................................................................... 63
       D.2.1 FIRST YEAR MODULES ..................................................................... 63
       D.2.2 SECOND YEAR MODULES .................................................................. 67
       D.2.3 THIRD YEAR MODULES ..................................................................... 70
E. B.SC. AGRICULTURE (AGRICULTURAL ECONOMICS) HONS (17BSAE) .......... 75
   E.1 PROGRAMME SCHEDULE ...................................................................... 75
   E.2 MODULE DESCRIPTORS .......................................................................... 77
       E.2.1 FIRST YEAR MODULES ..................................................................... 77
       E.2.2 SECOND YEAR MODULES .................................................................. 80
<table>
<thead>
<tr>
<th>Module Descriptors</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>F.1 PROGRAMME SCHEDULE</td>
<td>90</td>
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<tr>
<td>F.2.1 FIRST YEAR MODULES</td>
<td>92</td>
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</tr>
<tr>
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</tr>
<tr>
<td>J.2.3 THIRD YEAR MODULES</td>
<td>160</td>
</tr>
<tr>
<td>J.2.4 FOURTH YEAR COURSES: FORESTRY SPECIALIZATION</td>
<td>164</td>
</tr>
<tr>
<td>J.2.5 FOURTH YEAR COURSES: ENVIRONMENTAL SCIENCE SPECIALIZATION</td>
<td>167</td>
</tr>
<tr>
<td>K.1 PROGRAMME SCHEDULE</td>
<td>170</td>
</tr>
<tr>
<td>K.2.1 FIRST YEAR MODULES</td>
<td>171</td>
</tr>
<tr>
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<td>174</td>
</tr>
<tr>
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<td>178</td>
</tr>
<tr>
<td>K.2.4 FOURTH YEAR MODULES</td>
<td>182</td>
</tr>
<tr>
<td>L.1 CRITERIA FOR ADMISSION</td>
<td>186</td>
</tr>
<tr>
<td>L.2 ARTICULATION OPTIONS</td>
<td>186</td>
</tr>
<tr>
<td>L.3 MODE OF DELIVERY AND LOCATION</td>
<td>186</td>
</tr>
<tr>
<td>L.4 DURATION OF STUDY</td>
<td>186</td>
</tr>
<tr>
<td>L.5 MINIMUM REQUIREMENTS FOR RE-ADMISSION</td>
<td>186</td>
</tr>
<tr>
<td>L.6 ADVANCEMENT AND PROGRESSION RULES</td>
<td>187</td>
</tr>
<tr>
<td>L.7 MAXIMUM NUMBER OF CREDITS PER YEAR</td>
<td>187</td>
</tr>
<tr>
<td>L.8 REQUIREMENTS FOR QUALIFICATION AWARD</td>
<td>187</td>
</tr>
<tr>
<td>L.9 PROGRAMME SCHEDULE</td>
<td>187</td>
</tr>
</tbody>
</table>
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”
2020 ACADEMIC CALENDAR

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 SEMESTER

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

<table>
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<tr>
<th>DATE</th>
<th>GENERAL DATES</th>
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<tbody>
<tr>
<td>17 January</td>
<td>Last day for appeals (Semester 2 &amp; Double modules – Regular and Supplementary/Special examinations of November 2019)</td>
</tr>
<tr>
<td>7 February</td>
<td>Last day for application of retention of continuous assessment (C.A) mark and Last day for application for exemption(s)</td>
</tr>
<tr>
<td>7 February</td>
<td>Last day for Late Registration (Late fee payable)</td>
</tr>
<tr>
<td>7 February</td>
<td>Last day for approval of exemption(s)</td>
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<tr>
<td>7 February</td>
<td>Last day for approval of module(s) &amp; qualification changes</td>
</tr>
<tr>
<td>12 February</td>
<td>Last day for recommendation of retention of continuous assessment mark and Promotion Examinations by Faculties</td>
</tr>
<tr>
<td>14 February</td>
<td>Last day for approval of retention of continuous assessment mark and Promotion Examination by Examinations Department</td>
</tr>
<tr>
<td>28 February</td>
<td>Promotion Examination</td>
</tr>
<tr>
<td>12 February</td>
<td>Last day for recommendation of retention of continuous assessment mark and Promotion Examinations by Faculties</td>
</tr>
<tr>
<td>14 February</td>
<td>Last day for approval of retention of continuous assessment mark and Promotion Examination by Examinations Department</td>
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<tr>
<td>29 April</td>
<td>Last day for change of offering types at Regional Centres (Semester 1 modules)</td>
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<tr>
<td>3 August</td>
<td>Last day for Appeals (Semester 1 Modules - Regular and Supplementary/Special examinations of June 2019)</td>
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<tr>
<td>21 August</td>
<td>Last day to submit outstanding documentation</td>
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<tr>
<td>20 September</td>
<td>Last day to change offering types at Regional Centres (Semester 2 modules)</td>
</tr>
<tr>
<td>18 September</td>
<td>Last day to cancel enrolment</td>
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<tr>
<td>30 October</td>
<td>Last day to submit Theses and Dissertations for examinations</td>
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<tr>
<th>DATE</th>
<th>CANCELLATION DUE DATES</th>
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<tr>
<td>30 April</td>
<td>Last day to cancel Semester 1 modules</td>
</tr>
<tr>
<td>18 September</td>
<td>Last day to cancel Semester 2 modules</td>
</tr>
<tr>
<td>18 September</td>
<td>Last day to cancel Double modules (module that extends normally over one academic year)</td>
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<tr>
<th>DATE</th>
<th>FINANCE DUE DATES</th>
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<tr>
<td>2 March</td>
<td>Last day to cancel Semester 1 and Double modules with 100% credit</td>
</tr>
<tr>
<td>03 April</td>
<td>Last day to cancel Semester 1 modules with 50% credit</td>
</tr>
<tr>
<td>5 June</td>
<td>Last day to cancel Double modules with 50% credit</td>
</tr>
<tr>
<td>07 August</td>
<td>Last day to cancel Semester 2 modules with 100% credit</td>
</tr>
<tr>
<td>31 August</td>
<td>Last day to cancel Semester 2 modules with 50% credit</td>
</tr>
</tbody>
</table>
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 (Australian National University, Canberra - Australia), MSc (Australian National University, Canberra - Australia), PhD In Agric Ecology (Moscow State Agricultural University, Russia)

Deputy Dean:

Dr TO Amushendje: BSc. (Hons), Molecular Biology (Murdoch University, Western Australia); PhD, Molecular Genetics and Wool Science (Lincoln University, New Zealand).

Head of 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 Examinations Officer:

Ms Belinda Bock: Bachelor in Business Administration (UNAM)

Faculty Officer:

Ms Josefine Muhama: Bachelor in Agricultural Science (Namibia University of Science and Technology).

Secretary:

Mrs Lilian 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 Tjituuka: B.A. (Hons) Public Admin (Polytechnic of Wales); Postgraduate Diploma 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 STUugwanga: Diploma Information Studies (UNAM); BA Library Science & Records Management & History (UNAM); Postgraduate Diploma in Library & Information Studies (UCT); Master in Library and Information Studies (UCT)

Senior Library Assistant:

Mr T Ntesa: Diploma Information Studies (UNAM); B Arts: Information Science (UNISA)

Library Assistant:

Ms E Nguvuva: Diploma Records Management (Southern Business School); B Arts: Information Science (UNISA)

Library Assistant:

Mrs M Kaahangoro: Diploma 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)

Campus Administrator:

vacant

Student Support Officer:

Mr. A. Kandjimi: BA (UNAM), Dip. Local Government Studies(UNAM), Certificate in Procurement( AMAD University)

Fam 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)
<table>
<thead>
<tr>
<th>Title</th>
<th>Name</th>
<th>Email</th>
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<tbody>
<tr>
<td>Supervisor: National Dip. Agric (Tsumis)</td>
<td>Mr P Beukes</td>
<td></td>
</tr>
<tr>
<td>Supervisor: National Dip. Agric (Neudamm)</td>
<td>Mr B M Matomola</td>
<td></td>
</tr>
<tr>
<td>Supervisor: National Dip. Agric (Neudamm); B.Ed (UNAM); B.Agric Hons (Polytechnic of Namibia)</td>
<td>Mr J Ngavetene</td>
<td></td>
</tr>
<tr>
<td>Supervisor: National Dip. Agric (Ongongo), Higher Diploma in Education( North West University), B. Hons Agric Extension( University of Pretoria)</td>
<td>Mr G Sheehama</td>
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</tr>
<tr>
<td>Assistant Supervisor: Trade Dip. Petrol/Diesel Mechanic</td>
<td>Mr W Goussard</td>
<td></td>
</tr>
<tr>
<td>Assistant Supervisor: Trade Dip. Diesel Mechanic</td>
<td>Mr G Gomxob</td>
<td></td>
</tr>
<tr>
<td>Assistant Supervisor: Dip. Agric (Ongongo)</td>
<td>Mr. A. Tjiange</td>
<td></td>
</tr>
<tr>
<td>Assistant Supervisor: Dip. Agric (Ongongo)</td>
<td>Mr R Fredericks</td>
<td></td>
</tr>
<tr>
<td>Assistant Supervisor: Dip. Agric (Ongongo)</td>
<td>Mr R Kandjou</td>
<td></td>
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<tr>
<td>Assistant Supervisor: Dip. Agric (Ongongo)</td>
<td>Mr I Lisias</td>
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**OGONGO CAMPUS**

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

Tel: (061) 206 3363 / 3890  
Fax: (061) 206 3013 / 206 4027  
E-mail: bbock@unam.na  
Website: [www.unam.na → FANR (Faculty of Agriculture & Natural Resources)](http://www.unam.na)

OR

**The Assistant Faculty Officer**  
Faculty of Agriculture and Natural Resources  
University of Namibia  
Private Bag 5520  
OSHAKATI  
Namibia

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

Enquiries regarding specific subjects and departments must be addressed to the relevant Head of Department.
# DEPARTMENT OF AGRICULTURAL ECONOMICS (Neudamm Campus)

**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, Beijing 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: Dipl Agric (Polytechnic); B.Sc., M.Sc. Agric Econ (Fort Hare)  
**Lecturer:** Mr C Togarepi: Bsc Agric (UNAM); PGDE (UNAM), M.Sc Agric Econ (UNAM)  
**Lecturer:** Mr J N Muzanima: B Sc Agric Economics (UNAM); M Sc Agric Economics (IARI, India)  
**Assistant Lecturer:** Mr T Maharero: B.Sc. Agric (Natal), MBA (MANCOSA), South Africa  
**Lecturer:** Mr M N Ansgula: Nat Dip Agric (Ogongo); B.Sc. Agric (UNAM); M.Sc. (Michigan, USA)  
**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]

# DEPARTMENT OF ANIMAL SCIENCE (Neudamm Campus)

**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 TO Amushendje: B.Sc. Molecular Biology (Murdoch University, Western Australia); PhD, Molecular Genetics and Wool Science (University of Lincoln, New Zealand).  
**Senior Lecturer:** Dr N P Petrus: B.Agric. (Animal Science) University of Nigeria, Nsukka, Nigeria; M.S. (CIRAD- Montpellier (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)

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 (Alema), MSc (Alema), 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 Nanhapi: B.Sc. Agric (UNAM); M. Agric. Sc. (Nagoya Univ., Japan);

Lecturer: Mr K Hove: B Sc Mathematics (Hons) (MSU); M. Sc Operations Research (NUST-2m); PG DE (NUST-2m)

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)

Assistant Lecturer: Ms C K Kamburona-Ngavtene: B.Sc. Agric (UNAM); M.Sc. Genetics (Pretoria). Study Leave (Germany)

Assistant Lecturer: Mr P A Ausiku: National Dip Agric (Ogongo); B.Sc. Agric (UNAM); M Sc Agric (Kinki Univ., Japan), Study Leave (Univ. of Pretoria).

Assistant Lecturer: 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)

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)

2020 FANR PROSPECTUS
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); Postgraduate Dipl BusAdmin (UNAM); M Sc Acc & Finance (UNAM)

Lecturer: Dr S C Baming: 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)

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 Itembu: B.Sc. (UNAM), M.Sc. (Univ. of Tromso), Ph.D. (Rhodes)
Lecturer: Dr M Wilhelm: BSc Hons (UCT), MSc (UCT)
Lecturer: Mr L Kandjengo: B.Sc. (UNAM); B.Sc. Hons (UCT), M.Sc. (UCT)
Lecturer: Dr M Wilhlem: BSc Hons (UCT), MSc (UCT), PhD (UCT)
Lecturer: Mr M Tjipute: B.Sc. (Unam); B.Sc. Hons (Rhodes); 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 Hangome: ND Natural Resources Management (NUST), Bachelors Cert. Env Engineering (CPUT), M.Sc. (UPS)

DEPARTMENT OF INTEGRATED ENVIRONMENTAL SCIENCE (Ogonco Campus)

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 (Brandenburgische Technische Univestat Cottbus)

Lecturer: Mrs LKEM Halueendo: BSc. Zoology, Botany & Psychology (UNAM); BSc. Hons Crop Protection (Pretoria); MSc. Crop Protection (Pretoria), Professional Diploma in Education (UNAM).

Lecturer: Mr I Kaholongo: Cert Forestry (OAC); BSc. Forestry (Stellenbosch); M.Sc. Biodiversity Management and Research (UNAM)

Lecturer: Ms J Nipele: B.A. Tourism (UNAM); M. Sc. Geo-Information Science & Earth Observation Nat Res Mgt (Univ. Twente, The Netherlands) on study leave

Lecturer: Mr E Kasingua: 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 Peninsula 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)

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 eklingelhoerrer@unam.na Private Bag 1096, Venela Road, Katima Mulilo, Namibia

Head of Department: Dr E Klingelhoerrer

Associate Professor: Vacant

Senior Lecturer: Dr E Klingelhoerrer PhD – Oceanography/Fish Stock Assessment: University of Port Elizabeth (UPE) - Nelson Mandela Metropolitan 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 KwaZulu-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 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 (J KUAT), 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, Ongono College

**Lab Technologist:** Ms E Kasinda  
BSc (Hons) Environmental Biology & Geology, UNAM

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

<table>
<thead>
<tr>
<th>Contact Details</th>
<th>Email</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>(+264 61) 206 4043</td>
<td><a href="mailto:amaraais@unam.na">amaraais@unam.na</a></td>
<td>Private Bag 13301 Windhoek, Namibia</td>
</tr>
<tr>
<td>(+264 61) 206 4027</td>
<td><a href="mailto:ekandiwa@unam.na">ekandiwa@unam.na</a></td>
<td>Private Bag 13301 Windhoek, Namibia</td>
</tr>
</tbody>
</table>

**Associate Dean:** Dr A Marais: BVSc (University of Pretoria); BSc ; 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)**

<table>
<thead>
<tr>
<th>Contact Details</th>
<th>Email</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>(+264 61) 206 4080</td>
<td><a href="mailto:ekandiwa@unam.na">ekandiwa@unam.na</a></td>
<td>Private Bag 13301 Windhoek, Namibia</td>
</tr>
</tbody>
</table>

**Head of Department:** Dr E Kandiwa: BSc (Hons, Vet Physiol) University of Zimbabwe; BVSc (University of Zimbabwe); MSc (University of Liverpool)  
**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
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)

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 Sydney)
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)

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)

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 Aschenbon: 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 Hausku
Clinician: V Mutjavikua
Veterinary 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 of Zimbabwe); 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: BSc (Environmental Biology and Physiological and Molecular Biology (University of Namibia))
Field Technician: 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Programme</th>
<th>Minimum Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>(17HDAG)</td>
<td>Diploma in Agriculture</td>
<td>3 years full-time</td>
</tr>
<tr>
<td>(17HDNR)</td>
<td>Diploma in Natural Resources Management</td>
<td>3 years full-time</td>
</tr>
<tr>
<td>(17HDAH)</td>
<td>Diploma in Animal Health</td>
<td>3 years full-time</td>
</tr>
</tbody>
</table>

#### Degrees

<table>
<thead>
<tr>
<th>Code</th>
<th>Programme</th>
<th>Minimum Duration</th>
</tr>
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<tbody>
<tr>
<td>(17BSAE)</td>
<td>Bachelor of Science in Agriculture (Agricultural Economics) Hons</td>
<td>4 years full-time</td>
</tr>
<tr>
<td>(17BSAS)</td>
<td>Bachelor of Science in Agriculture (Animal Science) Hons</td>
<td>4 years full-time</td>
</tr>
<tr>
<td>(17BSCS)</td>
<td>Bachelor of Science in Agriculture (Crop Science) Hons</td>
<td>4 years full-time</td>
</tr>
<tr>
<td>(17BSFS)</td>
<td>Bachelor of Science in Agriculture (Food Science) Hons</td>
<td>4 years full-time</td>
</tr>
<tr>
<td>(17BSFA)</td>
<td>Bachelor of Science in Fisheries &amp; Aquatic Sciences (Hons)</td>
<td>4 years full-time</td>
</tr>
<tr>
<td>(17BSIE)</td>
<td>Bachelor of Science in Integrated Environmental Science (Hons)</td>
<td>4 years full-time</td>
</tr>
<tr>
<td>(17BSWM)</td>
<td>Bachelor of Science in Wildlife Management &amp; Ecotourism (Hons)</td>
<td>4 years full-time</td>
</tr>
<tr>
<td>(17BVET)</td>
<td>Bachelor of Veterinary Medicine (BVM)</td>
<td>6 years full-time</td>
</tr>
</tbody>
</table>

### A.1.2 POSTGRADUATE PROGRAMMES

#### Degree

<table>
<thead>
<tr>
<th>Code</th>
<th>Programme</th>
<th>Minimum Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>(17MSRR)</td>
<td>Master of Science in Rangeland Resources Management</td>
<td>2 years full-time</td>
</tr>
</tbody>
</table>

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) **For Diploma in Agriculture:** Any two of the following: a minimum “D” symbol Biology;
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 in 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 Mature 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.2.2.4 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.2.2.5 Candidates applying for the six-year fully-fledged **Bachelor of Veterinary Medicine (BVM)** Programme, will have the following minimum criteria:

A.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.2.2.5.1.1 English with a minimum B symbol or better at NSSC Ordinary Level, or a score of 3 or better at NSSC Higher Level;

A.2.2.5.1.2 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.2.2.5.1.3 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.2.2.5.1.4 Mathematics with a minimum B symbol or better at NSSC Ordinary Level, or score of 3 or better on NSSC Higher level;

A.2.2.5.1.5 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.2.2.5.1.6 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.2.2.6 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.2.2.7 Candidates may also be admitted into the BVM programme through Mature Age provision if they meet the following conditions:

A.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.2.2.7.2 They should have passed senior secondary school education;

A.2.2.7.3 They should have proof of at least five years veterinary relevant work experience;

A.2.2.7.4 They should pass all papers of the prescribed Mature Age Entry tests with a minimum of 60%.

A.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.2.2.9 Students from UNAM Foundation should have an average of 70% in each subject of the UNAM Foundation course (Mathematics, Physics, chemistry, biology);

A.2.2.10 Graduates with a four year BSc Degree will be admitted;

A.2.2.11 All prospective candidates will be interviewed to assess their suitability. Part of the interview will involve a short written section.

A.2.2.12 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 of 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 Ongono or Sam Nuyoma 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 (Ongono Campus);
- Diploma in Natural Resources Management (Ongono 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 Philosophy 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.5.2 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 program:

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 the 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 the 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 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.10.2 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 second 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 second 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
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).

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.

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 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.10.4.3 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 any modules in the second year.
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 have passed 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 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.10.7 Bachelor of Science in Fisheries & Aquatic Sciences (Honours)

A.10.7.1 First Year to Second Year
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).

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.

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 year 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**
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

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>NQF Level</th>
<th>Credits (C)</th>
<th>(Co-requisite) / Pre-requisite</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 1 Semester 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ULEG 2410</td>
<td>English for General Communication</td>
<td>4</td>
<td>16</td>
<td>C</td>
</tr>
<tr>
<td>UCIC 3509</td>
<td>Computer Literacy</td>
<td>5</td>
<td>8</td>
<td>C</td>
</tr>
<tr>
<td>UCSI 3580</td>
<td>Contemporary Social Issues</td>
<td>5</td>
<td>8</td>
<td>C</td>
</tr>
<tr>
<td>AABC 2411</td>
<td>Mathematics and Basic Statistics</td>
<td>4</td>
<td>16</td>
<td>C</td>
</tr>
<tr>
<td>AASC 2431</td>
<td>Biology</td>
<td>4</td>
<td>16</td>
<td>C</td>
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<tr>
<td>AACA 2400</td>
<td>Farm Duties I</td>
<td>4</td>
<td>8</td>
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<tr>
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<td>ULEG 2410</td>
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<td>16</td>
<td>C</td>
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<td>AABC 2482</td>
<td>Basic Economics</td>
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<td>AASC 2432</td>
<td>Physical Science</td>
<td>4</td>
<td>16</td>
<td>C</td>
</tr>
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<td>AASC 2422</td>
<td>Animal Anatomy, Physiology and Reproduction</td>
<td>4</td>
<td>8</td>
<td>C</td>
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<td>Farm Duties I</td>
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<tr>
<td>AABC 2541</td>
<td>Communication and Information Systems</td>
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<tr>
<td>AABC 2501</td>
<td>Financial Management</td>
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<tr>
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<tr>
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<td>Soil Science</td>
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<tr>
<td>ACSC 2582</td>
<td>Introduction to Research technology, surveying and farm structures</td>
<td>5</td>
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<td>Applied Animal Breeding</td>
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<td>8</td>
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<td>AACA 2600</td>
<td>Special Study</td>
<td>6</td>
<td>8</td>
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<td>ACSC 2582 (Introduction to Research)</td>
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<tr>
<td>AACA 2601</td>
<td>Field Attachment</td>
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<td>AABC 2641</td>
<td>Principles of Agricultural Extension</td>
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<tr>
<td>AASC 2681</td>
<td>Intensive Animal Production</td>
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<td>12</td>
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<tr>
<td>ACSC 2601</td>
<td>Water Management and Soil Conservation</td>
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<tr>
<td>AASC 2691</td>
<td>Range Management</td>
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<td>ACSC 2682</td>
<td>Farm Power and Machinery</td>
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<tr>
<td>ACSC 2622</td>
<td>Crop Protection</td>
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**Total Credits Semester 1:** 68

**Year 3 Semester 2**

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title</th>
<th>Contact Hours</th>
<th>Credits</th>
<th>Pre-requisites</th>
<th>Module Content</th>
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</thead>
<tbody>
<tr>
<td>AACA 2600</td>
<td>Special Study</td>
<td>6</td>
<td>8</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>AAEC 2602</td>
<td>Project Management</td>
<td>6</td>
<td>8</td>
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<tr>
<td>AAEC 2622</td>
<td>Entrepreneurship</td>
<td>6</td>
<td>8</td>
<td>C</td>
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<tr>
<td>AASC 2622</td>
<td>Animal nutrition and Feeding</td>
<td>6</td>
<td>8</td>
<td>C</td>
<td>None</td>
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<tr>
<td>AASC 2602</td>
<td>Game Farming</td>
<td>6</td>
<td>8</td>
<td>C</td>
<td>None</td>
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<tr>
<td>AASC 2642</td>
<td>Extensive Animal Production</td>
<td>6</td>
<td>8</td>
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<td>None</td>
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<tr>
<td>ACSC 2622</td>
<td>Crop Protection</td>
<td>6</td>
<td>8</td>
<td>C</td>
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</tbody>
</table>

**Total credits Semester 2:** 68

**Total Credits Year 3:** 132

**Total Program Credits:** 388

---

### B.2 MODULE DESCRIPTORS

#### B.2.1 FIRST YEAR MODULES

**ULEG 2410: ENGLISH FOR GENERAL COMMUNICATION**

<table>
<thead>
<tr>
<th>Module title:</th>
<th>ENGLISH FOR GENERAL COMMUNICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code:</td>
<td>ULEG 2410</td>
</tr>
<tr>
<td>NQF Level:</td>
<td>4</td>
</tr>
<tr>
<td>Contact hours:</td>
<td>4 hours per week for 28 weeks</td>
</tr>
<tr>
<td>Credits:</td>
<td>32</td>
</tr>
<tr>
<td>Module Assessment:</td>
<td>Continuous Assessment (60%): 4 reading tests, 4 writing tests, 2 oral presentations, 1 literature worksheet. Examination (40%): 1x3 hour paper</td>
</tr>
<tr>
<td>Pre-requisites:</td>
<td>None</td>
</tr>
<tr>
<td>Module Content:</td>
<td>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.</td>
</tr>
</tbody>
</table>

**CLC 3509: COMPUTER LITERACY**

<table>
<thead>
<tr>
<th>Module title:</th>
<th>COMPUTER LITERACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code:</td>
<td>CLC 3509</td>
</tr>
<tr>
<td>NQF level:</td>
<td>5</td>
</tr>
<tr>
<td>Contact hours:</td>
<td>1 lecture theory and 1 lecture practical per week for 14 weeks</td>
</tr>
<tr>
<td>Credits:</td>
<td>8</td>
</tr>
<tr>
<td>Module Assessment:</td>
<td>Continuous Assessment 100% 2 Practical Tests 50%, 2 Theory Tests 50%</td>
</tr>
<tr>
<td>Pre-requisites:</td>
<td>University Entry</td>
</tr>
<tr>
<td>Module Content:</td>
<td>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.</td>
</tr>
</tbody>
</table>

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2020 FANR PROSPECTUS
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

<table>
<thead>
<tr>
<th>Module Title</th>
<th>CONTEMPORARY SOCIAL ISSUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>CSI 3580</td>
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<tr>
<td>NQF Level</td>
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</tr>
<tr>
<td>NQF Credits</td>
<td>8</td>
</tr>
<tr>
<td>Contact hours</td>
<td>Equivalent to 1 hour per week for 2 semesters (Online)</td>
</tr>
<tr>
<td>Prerequisite</td>
<td>None</td>
</tr>
<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Semester Offered</td>
<td>1&amp;2</td>
</tr>
</tbody>
</table>

**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

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

**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

<table>
<thead>
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<th>Module Title</th>
<th>BIOLOGY</th>
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<tbody>
<tr>
<td>Code</td>
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<tr>
<td>NQF Level</td>
<td>4</td>
</tr>
<tr>
<td>NQF Credits</td>
<td>16</td>
</tr>
<tr>
<td>Assessment Strategies</td>
<td>Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 3 hour paper)</td>
</tr>
<tr>
<td>Contact hours</td>
<td>4 hours per week lectures; 3 hours per week practicals for 14 weeks</td>
</tr>
<tr>
<td>Prerequisite</td>
<td>None</td>
</tr>
<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
</tr>
</tbody>
</table>
**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.

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**AACA 2400: FARM DUTIES I**

<table>
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<th>FARM DUTIES I</th>
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</thead>
<tbody>
<tr>
<td>Code</td>
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<td>4</td>
</tr>
<tr>
<td>NQF Credits</td>
<td>16</td>
</tr>
<tr>
<td>Assessment Strategies</td>
<td>Pass or fail grade. Pass with more than 80% attendance</td>
</tr>
<tr>
<td>Contact hours</td>
<td>One full day (7 hour day) alternating for 28 weeks</td>
</tr>
<tr>
<td>Prerequisite</td>
<td>None</td>
</tr>
<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Semester Offered</td>
<td>1&amp;2</td>
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**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).

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**AAEC 2482: BASIC ECONOMICS**

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<td>NQF Credits</td>
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<tr>
<td>Assessment Strategies</td>
<td>Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)</td>
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<tr>
<td>Contact hours</td>
<td>3 hours lectures and 2 hours practical per week for 14 weeks</td>
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<td>Prerequisite</td>
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<td>Compulsory/Elective</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Semester Offered</td>
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</table>

**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.

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**AASC 2432: PHYSICAL SCIENCE**

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<tr>
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2020 FANR PROSPECTUS
Module Aims:
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 covered in this module.

B.2.2 SECOND YEAR MODULES

AACA 2500: FARM DUTIES II

Module Title: FARM DUTIES II

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

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 practicals 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:**  

### 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 caused 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

<table>
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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:

ACSC 2532: VEGETABLE AND FRUIT PRODUCTION

Module Title: VEGETABLE AND FRUIT PRODUCTION

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<thead>
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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

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</thead>
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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:

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)

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

AA CA 2600: SPECIAL STUDY

Module Title: SPECIAL STUDY
Code: AACA 2600
NQF Level: 6
NQF Credits: 16
Contact hours: 32
Prerequisite: None
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
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.

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                6

Credits                    Assessment
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          6

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 Lectures hours / week 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:**

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

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**AASC 2691: RANGE MANAGEMENT**

<table>
<thead>
<tr>
<th>Module Title: RANGE MANAGEMENT</th>
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<tbody>
<tr>
<td>Code</td>
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<tr>
<td>NQF Level</td>
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<td>Assessment Strategies</td>
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<tr>
<td>Contact hours</td>
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<td>Compulsory/ Elective</td>
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<tr>
<td>Semester Offered</td>
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</tbody>
</table>

**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.

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**AAEC 2602: PROJECT MANAGEMENT**

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<th>Module Title: PROJECT MANAGEMENT</th>
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<tbody>
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<td>Contact hours</td>
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<tr>
<td>Compulsory/ Elective</td>
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<tr>
<td>Semester Offered</td>
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</tbody>
</table>

**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:**

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**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.

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**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:**
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:

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:

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:
### C. DIPLOMA IN NATURAL RESOURCES MANAGEMENT
(Okongo Campus) [17HDNR]

#### C.1 PROGRAMME SCHEDULE

<table>
<thead>
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<th>Course code</th>
<th>Course name</th>
<th>NQF Level</th>
<th>Credits</th>
<th>Compulsory(C)</th>
<th>(Co-requisite) / Pre-requisite</th>
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**Total Credits Semester 1**: 64

**Year 3 Semester 2**

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<td>AIES 2652</td>
<td>Principles of Wildlife Management</td>
<td>6</td>
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<td>Special Study</td>
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**Total credits Semester 2**: 64

**TOTAL CREDITS YEAR 3**: 128

**TOTAL CREDITS FOR THE PROGRAMME**: 388

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### C.2.1 MODULE DESCRIPTORS

#### C.2.2 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**

<table>
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<th>Module Title:</th>
<th>CONTEMPORARY SOCIAL ISSUES</th>
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<tr>
<td>Code</td>
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<tr>
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<tr>
<td>Contact hours</td>
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<td>Prerequisite</td>
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<td>Compulsory/Elective</td>
<td>Compulsory</td>
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<tr>
<td>Semester Offered</td>
<td>1&amp;2</td>
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**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**

<table>
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<td>Assessment Strategies</td>
<td>Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 3 hour paper)</td>
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2020 FANR PROSPECTUS
### 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.

### AAEC 2482: BASIC ECONOMICS

**Module Title:** BASIC ECONOMICS  
**Code:** AAEC 2482  
**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

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 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% (1 x 2 hour theory paper).
Contact hours: 2 hours of lectures per week, 3 h practicals alternate week
Compulsory/Elective: Compulsory
Semester offered: 2

Module Content:

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:

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 hours theory 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 lecture 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
### ACSC 2581: SOIL SCIENCE

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**Module Content:**

### AIES2582: VEGETATION ASSESSMENT AND MONITORING TECHNIQUES

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<td>Prerequisite</td>
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<td>Semester offered</td>
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**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

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<td>Contact hours</td>
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Module Title: SILVICULTURE
Code: AIES2542
NQF level: 5
NQF Credits: 8
Assessment strategies: Continuous assessments 60% (Minimum 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:

Module Title: APPLIED ENTOMOLOGY
Code: AIES2562
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:

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

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:

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: None
Compulsory/Elective: Compulsory
Semester offered: 2

Module Content:
Assessment strategies
Continuous assessments 60% (minimum of 2 tests, 4 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 roundwood, sawn wood, pulpwood, particles and other industrial roundwood, fencing and other construction poles, handicrafts 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), handicrafts, 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, meions 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:

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
**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

**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.

**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
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 assessment 60% (minimum 2 tests, 4 practical reports, and 2 assignments); Examination 40% (1 x 3 hours theory paper).

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 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**

<table>
<thead>
<tr>
<th>Code</th>
<th>AAEC 2602</th>
</tr>
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<tbody>
<tr>
<td>NQF Level</td>
<td>5</td>
</tr>
<tr>
<td>NQF Credits</td>
<td>8</td>
</tr>
<tr>
<td>Contact hours</td>
<td>2 hours of lectures per week and 2 hour practical alternate week 14 weeks</td>
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<tr>
<td>Prerequisite</td>
<td>None</td>
</tr>
<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Semester Offered</td>
<td>1</td>
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</table>

**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**

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

**Semester 2**

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<th>CO-REQUISITES</th>
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<tbody>
<tr>
<td>LEG 2410</td>
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<tr>
<td>CSI 3580</td>
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<tr>
<td>DAH 2402</td>
<td>Veterinary Paraprofessional Skills</td>
<td>4</td>
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<tr>
<td>DAH 2412</td>
<td>Animal Anatomy I</td>
<td>4</td>
<td>04/56</td>
<td>42</td>
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<tr>
<td>DAH 2432</td>
<td>Animal Physiology I</td>
<td>4</td>
<td>04/56</td>
<td>0</td>
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<tr>
<td>DAH 2452</td>
<td>Basic Animal Behaviour, Handling and Welfare</td>
<td>4</td>
<td>04/56</td>
<td>21</td>
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**Total Semester 2 credits:** 76

#### YEAR 2 (144 CREDITS)

**Semester 1**

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<tbody>
<tr>
<td>DAH 2501</td>
<td>Basic Veterinary Parasitology</td>
<td>5</td>
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<tr>
<td>DAH 2511</td>
<td>Animal Anatomy II</td>
<td>5</td>
<td>04/56</td>
<td>42</td>
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<tr>
<td>DAH 2531</td>
<td>Animal Physiology II</td>
<td>5</td>
<td>04/56</td>
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<tr>
<td>DAH 2551</td>
<td>Infectious Diseases I</td>
<td>5</td>
<td>04/56</td>
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<tr>
<td>DAH 2571</td>
<td>Basic Pharmacology and Toxicology</td>
<td>5</td>
<td>04/56</td>
<td>21</td>
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**Total semester 1 credits:** 72

**Semester 2**

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<tr>
<td>DAH 2522</td>
<td>Research Methods</td>
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<tr>
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<td>Animal Pathology</td>
<td>5</td>
<td>04/56</td>
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<td>DAH 2412; DAH 2432</td>
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<td>DAH 2532</td>
<td>Animal Production and Reproduction</td>
<td>5</td>
<td>04/56</td>
<td>42</td>
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<td>DAH 2511; DAH 2531</td>
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<tr>
<td>DAH 2552</td>
<td>Animal Nutrition</td>
<td>5</td>
<td>04/56</td>
<td>42</td>
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<td>DAH 2509</td>
<td>Field Attachment (Animal Production)</td>
<td>5</td>
<td>2 weeks</td>
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**Total semester 2 credits:** 72

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61

2020 FANR PROSPECTUS
YEAR 3 (128 CREDITS)
Semester 1 and 2

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<tr>
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Semester 1

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<th>CO-REQUISITES</th>
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<tbody>
<tr>
<td>DAH 2601</td>
<td>Legislation and Jurisprudence</td>
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<tr>
<td>DAH 2621</td>
<td>Introduction to Veterinary Epidemiology</td>
<td>6</td>
<td>02/28</td>
<td>14</td>
<td>8</td>
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<tr>
<td>DAH 2641</td>
<td>Herd and Flock Health Management</td>
<td>6</td>
<td>02/56</td>
<td>21</td>
<td>8</td>
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<tr>
<td>DAH 2661</td>
<td>Introduction to Veterinary Public Health</td>
<td>6</td>
<td>02/56</td>
<td>21</td>
<td>8</td>
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</table>

In addition to the above students in the Animal Health Technician option will cover the following modules
<table>
<thead>
<tr>
<th>MODULE CODE</th>
<th>MODULE TITLE</th>
<th>NQF LEVEL</th>
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<th>P</th>
<th>CREDITS</th>
<th>PRE-REQUISITES</th>
<th>CO-REQUISITES</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAT 2601</td>
<td>Veterinary First Aid</td>
<td>6</td>
<td>02/28</td>
<td>21</td>
<td>8</td>
<td>DAH 2532</td>
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<tr>
<td>VAT 2611</td>
<td>Animal Health Extension</td>
<td>6</td>
<td>04/56</td>
<td>42</td>
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<td>DAH 2552</td>
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</table>

In addition to the above students in the Laboratory Technologist option will cover the following modules
<table>
<thead>
<tr>
<th>MODULE CODE</th>
<th>MODULE TITLE</th>
<th>NQF LEVEL</th>
<th>L</th>
<th>P</th>
<th>CREDITS</th>
<th>PRE-REQUISITES</th>
<th>CO-REQUISITES</th>
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</thead>
<tbody>
<tr>
<td>VVT 2601</td>
<td>Laboratory Biosafety and Biosecurity</td>
<td>6</td>
<td>02/28</td>
<td>21</td>
<td>8</td>
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<tr>
<td>VVT 2611</td>
<td>Laboratory Techniques</td>
<td>6</td>
<td>04/56</td>
<td>42</td>
<td>16</td>
<td>DAH 2431</td>
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</table>

Total semester 1 credits: 56

Semester 2: Rotations

I. Animal Health Technician option

<table>
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<tr>
<th>MODULE CODE</th>
<th>MODULE TITLE</th>
<th>NQF LEVEL</th>
<th>L</th>
<th>P</th>
<th>CREDITS</th>
<th>PRE-REQUISITES</th>
<th>CO-REQUISITES</th>
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</thead>
<tbody>
<tr>
<td>VAT 2682</td>
<td>Para-Professional Rotations AHT</td>
<td>6</td>
<td>10 weeks</td>
<td></td>
<td>56</td>
<td>All 1st and 2nd year modules</td>
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Total semester 2 credits: 56

II. Laboratory Technologist option

<table>
<thead>
<tr>
<th>MODULE CODE</th>
<th>MODULE TITLE</th>
<th>NQF LEVEL</th>
<th>L</th>
<th>P</th>
<th>CREDITS</th>
<th>PRE-REQUISITES</th>
<th>CO-REQUISITES</th>
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</thead>
<tbody>
<tr>
<td>VVT 2682</td>
<td>Para-Professional Rotations LT</td>
<td>6</td>
<td>10 weeks</td>
<td></td>
<td>56</td>
<td>All 1st and 2nd year modules</td>
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</table>

Total semester 2 credits: 56

TOTAL PROGRAMME CREDITS: 416
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 that all pre-requisites are met.

D.2 MODULE DESCRIPTORS

D.2.1 FIRST YEAR MODULES

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

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)

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

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 draw 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
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 communication with clients to gain their confidence and cooperation, 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 entrepreneurial 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 7x practical assessments)
2. Examination: 40% (1x 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 5x practical assessments)
2. Examination: 40% (1x 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
Pre-requisite: 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 5x practical assessments)
2. Examination: 40% (1x 3 hour paper)
# SECOND YEAR MODULES

<table>
<thead>
<tr>
<th>Module Title:</th>
<th>BASIC VETERINARY PARASITOLOGY</th>
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<tbody>
<tr>
<td>Code</td>
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**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)

<table>
<thead>
<tr>
<th>Module Title:</th>
<th>ANIMAL ANATOMY II</th>
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<td>Semester Offered</td>
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</table>

**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%)

<table>
<thead>
<tr>
<th>Module Title:</th>
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**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, antiserum, 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, merycur, 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
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 2 x theory assessments and 5 x practical assessments)
2. Examination: 40% (1 x 2 hour paper)
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 carying 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**
Continuous 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
**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:**  

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

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**Module Title:** INTRODUCTION TO VETERINARY EPIDEMILOGY  
**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)

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**Module Title:** HERD AND FLOCK HEALTH MANAGEMENT  
**Code:** DAH 2641
NQF Level 6
Contact hours Lectures: 2 x 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: **ANIMAL HEALTH EXTENSION**

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<td>Semester Offered</td>
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</table>

**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**

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<tr>
<td>Prerequisite</td>
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<td>Elective</td>
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<td>Semester Offered</td>
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</table>

**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**

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<td>Compulsory/Elective</td>
<td>Elective</td>
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<td>Semester Offered</td>
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**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: VAT2682
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: VVT2682
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

<table>
<thead>
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<th>Course code</th>
<th>Course name</th>
<th>NQF Level</th>
<th>Credits</th>
<th>Compulsory(C) / Elective (E)</th>
<th>(Co-requisite) / Pre-requisite</th>
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<td>UCLC 3509</td>
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<td>CEMA 3572</td>
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<td>Introduction to Statistics</td>
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<td>ULEA 3519</td>
<td>English for Academic Purposes</td>
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| **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      | C                           | None                          |
| AAEA 3681  | Agric. Communication and Group Dynamics             | 6         | 12      | C                           | None                          |
| ACSC 3691  | Agronomy                                            | 6         | 12      | C                           | None                          |
| **Total Credits Semester 1** | | | | | 60 |

<p>| <strong>Year 2 Semester 2</strong> | | | | | |
| AAEC 3682  | Production Economics                                | 6         | 12      | C                           | CEMI3571 (Basic Microeconomics) |
| AAEI 3682  | Intermediate Macroeconomics                         | 6         | 12      | C                           | CEMI3572 (Basic Macroeconomics) |
| AAEC 3612  | Mathematical Economics &amp; Linear Programming         | 6         | 16      | C                           | SMAT 3511 (Basic Mathematics)  |</p>
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<td>ACSE 3781</td>
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<tr>
<td>AAEC 3751</td>
<td>Econometrics</td>
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<td>16</td>
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<td>AAER 3781</td>
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<td>AAEC 3712</td>
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<td>Crop Storage and Handling</td>
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<td>AAEC 3810</td>
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<td>AAEC 3881</td>
<td>Project Planning and Management</td>
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<td>AAEC 3891</td>
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<td>AASC 3881</td>
<td>Beef Production</td>
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<td>AAER 3782 (Research Methodology in Agricultural Economics)</td>
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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:** None

**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
- **Credits:** 4 hours per week for 14 weeks
- **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 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: SBLG 3511
Course Equivalent: Biology 1A 4
NQF level: 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 domain 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: 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).
Prerequisites: NSCC 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 than 10 marked assignments) 50%  
- Examination: 60% (1 x 2 hour examination paper)  
**Prerequisites:** NSSC (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 principal 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, Bogeography, 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, Proterostomate phyla: Nemertea, Mollusca, Annelida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora, Deuterostomate phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chondrichthyes, 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.

### SMAT3512: 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).  
**Prerequisites:** 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 IGCS Mathematics

Module Content:

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 3571 Basic 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 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: 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 1 hour 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)
## Third Year Modules

### Field Attachment I

- **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.)

### Econometrics

- **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 multicollinearity, autocorrelation, heteroscedasticity, 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)

### Resource Economics

- **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:** AEAE 3681 Intermediate Microeconomics
- **Compulsory/Elective:** Compulsory
- **Semester Offered:** 1

**Module Content:**
The course includes 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 key questions such as: why some countries are 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 country’s 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 explores 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: AAEA 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
Module Title: Research Methodology in Agricultural Economics
Code: AAER 3782
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 includes 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 1.5 hours 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)
### Module Title: PRINCIPLES OF MICROECONOMICS

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**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

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**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

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<tr>
<th>Coursecode</th>
<th>Course name</th>
<th>NQF Level</th>
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<td>AASC 3881</td>
<td>Beef Production</td>
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<td>AASC 3821</td>
<td>Poultry Production</td>
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<td>AASC 3892</td>
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<td>Dairy Production</td>
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|             | **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: work sheets 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 primary 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  
**Credits:** 16  
**Biology 1A 4**  
4 lectures/week for 14 weeks and one 3-hour practical session per week.

**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 domain 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 careers.

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:** SMAT3511  
**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).

**Prerequisites:** 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)
Prerequisites: 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, reactions 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)
Prerequisites: 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.
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, Protostome phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostome phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Placoderm, Chordichthyes, Actinopterygii, Actinista, 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 (42 hours); Practicals: 1X 3 hours/fort  
**Semester Offered:** 1

**Module Content:**

This course introduces 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 x 2 hour paper).

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<th>Module Title: INTRODUCTION TO RANGE MANAGEMENT</th>
<th>Code</th>
<th>NQF Level</th>
<th>NQF Credits</th>
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<th>Prerequisite</th>
<th>Compulsory/Elective</th>
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<td>AASC 3691</td>
<td>6</td>
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<td>Chemistry for Life Sciences (CHM3532)</td>
<td>Compulsory</td>
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**Module Content**
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 x 2 hr paper)

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<th>Module Title: BIOCHEMISTRY</th>
<th>Code</th>
<th>NQF Level</th>
<th>NQF Credits</th>
<th>Contact Hours</th>
<th>Prerequisite</th>
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<td>AASC 3612</td>
<td>6</td>
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<td>4 x 1 hour Lectures / week for 14 weeks (56 hours); Practicals: 1X 3 hours/fort weekly for 7 weeks (21 hours)</td>
<td>Chemistry for Life Sciences (CHM3532)</td>
<td>Compulsory</td>
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</table>

**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.

**ENZYMOLGY**: Enzymes as organic catalysts; Enzyme nomenclature; Factors affecting activities of enzymes; Enzyme kinetics - The Michaelis-Menten equation; The Lineweaver-Burk plot; Enzyme inhibition; Allostereism.


**METABOLISM**: Catabolism and Anabolism; Carbohydrate catabolism (Glycolysis, Alcohol and lactic acid Metabolism, TCA 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, malonyl 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.
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: None
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 x 2 hr paper)

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Module Title: FIELD ATTACHMENT
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.)

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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 x 2 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 Catarhal 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, immunity in parasitic infections, antibody response in parasite infections, Antigenic variation, Immunotolerance. **PROTOZOA:** Coccidiosis, Trichomoniasis, Babesiosis, Anaplasmosis, Toxoplasmosis, Trypanosomiasis. **HELMINTHES:** Ascarasis, Parasitic gastroenteritis (PGE), Trichinellosis, Cysticercosis, Sibelia hepatica, Echinococcosis, **ECTOPARASITES:** Mange, Sarcoptic, Chorioptic, Demodecoasis. 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 x 2 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 characteristic/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**
Continuos Assessment: 40% (2x assignments + 2 tests + at least 10 marked practicals).
Exam: 60% (1 x 2 hr paper)

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**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 5 marked practicals).
Exam: 60% (1 x 3 hr paper)

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**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, slages, 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 x 2 hr paper)

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**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

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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 x 2 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 as 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, C3 vs. C4, 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 x 3 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.

2020 FANR PROSPECTUS
**Assessment Strategies**
Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals).
Exam: 60% (1 x 2 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 x 2 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 x 2 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
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 x 2 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 x 2 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  
Contact hours: 2 x 1 hour Lectures / week for 14 weeks; 03 Practical hours alternate 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

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**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)

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 351: INTRODUCTION TO BIOLOGY**

**Module Title:** INTRODUCTION TO BIOLOGY  
**Code:** SBLG 351  
**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 domain 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 career. 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).  
**Prerequisites:** 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)

**Prerequisites:** 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; 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)

**Prerequisites:** 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: NSSC (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, Pyrophyta, Cryptophyta, Protostome phyla: Nematode, Annelida, Arthropoda, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostome phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placodermes, Chordichthytes, 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
### BIOMATHEMATICS

#### Module Title: BIOSTATISTICS

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<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>NQF Level</td>
<td>ACRS 3681</td>
</tr>
<tr>
<td>Contact hours NQF</td>
<td>14 12</td>
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<tr>
<td>NQF Credits</td>
<td>3 lecture hours / week for 14 weeks; 3 tutorial / practical hours alternate weeks for 14 weeks</td>
</tr>
<tr>
<td>Prerequisite</td>
<td>SMAT 3511 Basic Mathematics</td>
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<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
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<td>Semester Offered</td>
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**Module Content:**

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

### PLANT SCIENCE

#### Module Title: PLANT SCIENCE

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>NQF Level</td>
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<tr>
<td>Contact hours NQF</td>
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<td>NQF Credits</td>
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<tr>
<td>Prerequisite</td>
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<td>Semester Offered</td>
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</table>

**Module Content:**

**Assessment Strategies**
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

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<thead>
<tr>
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<th>ACRS 3682</th>
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<tbody>
<tr>
<td>Contact hours NQF</td>
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<td>Credits Prerequisite</td>
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<td>Compulsory/Elective</td>
<td>Compulsory</td>
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<tr>
<td>Semester Offered</td>
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</tbody>
</table>

**Module Content:**

**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

<table>
<thead>
<tr>
<th>Code NQF Level</th>
<th>ACSC 3791</th>
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<tbody>
<tr>
<td>Contact hours NQF</td>
<td>03 Lecture hours / week for 14 weeks; 02 Practical hours / week for 14 weeks</td>
</tr>
<tr>
<td>Credits Prerequisite</td>
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</tr>
<tr>
<td>Compulsory/Elective</td>
<td>ACSC 3681 Plant Science</td>
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<tr>
<td>Semester Offered</td>
<td>Compulsory</td>
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</tbody>
</table>

**Module Content:**
Cereals crops (pear millet, maize, wheat, sorghum, rice); oilseed crops (sunflower, soybean, groundnut, castor 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

<table>
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<tr>
<th>Code NQF Level</th>
<th>ACSE 3781</th>
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<tr>
<td>Contact hours</td>
<td>03 Lecture hours / week for 14 weeks; 02 Practical hours / week for 14 weeks</td>
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<tr>
<td>Credits Prerequisite</td>
<td>None</td>
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<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
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</table>

**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: **HORTICULURE 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:**

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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:**

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

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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**

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<td>NQF Level</td>
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<tr>
<td>Contact hours</td>
<td>03 Lecture hours / week for 14 weeks; 03 Practical hours / alternate week for 14 weeks</td>
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<td>NQF Credits</td>
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<tr>
<td>Prerequisite</td>
<td>AASC 3681 Genetics</td>
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<td>Compulsory/Elective</td>
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<td>Semester Offered</td>
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</table>

**Module Content**


**Assessment strategies**

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

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Module Title: **RESEARCH METHODS**

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<tr>
<th>Code</th>
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<td>NQF Level</td>
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</tr>
<tr>
<td>Contact hours</td>
<td>03 lecture hours / week for 14 weeks; 3 tutorial hours / practical hours alternate weeks for 14 weeks</td>
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<tr>
<td>NQF Credits</td>
<td>12</td>
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<tr>
<td>Co-requisite</td>
<td>ACSR 3681: BIOSTATISTICS</td>
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<td>Compulsory/Elective</td>
<td>Compulsory</td>
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<tr>
<td>Semester Offered</td>
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</table>

**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)

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Module Title: **CROP ECOPHYSIOLOGY**

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<th>Code</th>
<th>ACSR 3702</th>
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<tr>
<td>NQF Level</td>
<td>7</td>
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<tr>
<td>Contact hours</td>
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<tr>
<td>NQF Credits</td>
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<tr>
<td>Pre-requisite</td>
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<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
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<tr>
<td>Semester Offered</td>
<td>2</td>
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</table>

**Module Content**

Flowering, Maturation and ripening. Senescence and abscission. 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

NQF Credits: 8
Pre-requisite: None
Compulsory/Elective: Compulsory
Semester Offered: 2

Module Content:

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

NQF Credits: 8
Pre-requisite: None
Compulsory/Elective: Compulsory
Semester Offered: 2

Module Content:

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
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 workforce 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: AASC 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: AASC 3681 Plant Science
Compulsory/Elective: Compulsory
Semester Offered: 1

Module Content:

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:

### 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 3861  
**NQF Level:** 8  
**Contact hours:** 03 Lecture hours/week for 14 weeks  
02 Practical hours/week for 14 weeks  
**NQF Credits:** 12  
**Pre-requisite:** ACSC 3862 Soil Science for Crop Production  
**Compulsory/Elective:** Compulsory  
**Semester Offered:** 1

### Module Content:

## 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 3861 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:
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)

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**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:**

**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:** 02 Lecture 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:**

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

Assessment Strategies
Continuous Assessment: 40% (1x assignments + 2 tests + at least 3 marked practicals).
Exam: 60% (1 x 3 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course name</th>
<th>NQF Level</th>
<th>Credits</th>
<th>Compulsory/Elective (E)</th>
<th>(C) Compulsory Pre-requisites</th>
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<tr>
<td>UCLC 3509</td>
<td>Computer Literacy</td>
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<td>ULE 3419</td>
<td>English Communication and Study Skills</td>
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<td>SBLG 3511</td>
<td>Introduction to Biology</td>
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<td>SPHY 3501</td>
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<td>6</td>
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<td>CSC 3792 (Research Methods)</td>
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<td>AFST 3841</td>
<td>Quality Management Systems</td>
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<td>AFST 3881</td>
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<td>AFST 3891</td>
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<td>FSC 3782 (Principles of Food Engineering)</td>
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<td>AFST 3861</td>
<td>Food Packaging, Storage &amp; Distribution</td>
<td>8 8 C</td>
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<td>AFST 3810</td>
<td>Research Project</td>
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<td>CSC 3792 (Research Methods)</td>
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### H.2 MODULE DESCRIPTORS

#### H.2.1 FIRST YEAR MODULES

**CLC 3509 COMPUTER LITERACY**

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<td>Code:</td>
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<tr>
<td>NQF level:</td>
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<td>Contact hours:</td>
<td>1 lecture theory and 1 lecture practical per week for 14 weeks</td>
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<td>Credits:</td>
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<tr>
<td>Module assessment:</td>
<td>Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%</td>
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<tr>
<td>Prerequisites:</td>
<td>University Entry</td>
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**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.

**LCE 3419 ENGLISH COMMUNICATION & STUDY SKILLS**

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<th>ENGLISH COMMUNICATION AND STUDY SKILLS</th>
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<tr>
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<tr>
<td>Module Assessment:</td>
<td>Continuous assessment (60%): two tests (reading and writing), two reading assignments, one oral presentation Examination (40%): one three hour examination paper</td>
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<td>Pre-requisites:</td>
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**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**

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<td>1 &amp; 2 (Year Module)</td>
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**Module Descriptor (Rationale of the module):**
The module, Contemporary Social Issues (CS3580), 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 draw 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 assignments), 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 domain 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.
- **Prerequisites:** 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 career. 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:** SMAT3511
### 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; 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; alkenes and alkynes; oxidation and reduction; addition reactions; stereoisomerism. 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. The following topics will also be covered: Electric charge 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 than 10 marked assignments) 50%; Examination: 60% (1 x 2 hour examination paper)
Pre-requisites: NSSC (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 principal 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, Protostome phyla: Nemertea, Mollusca, Annelida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostome phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderm, Chordichthyes, 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).
Pre-requisites: 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

<table>
<thead>
<tr>
<th>Module Title: POSTHARVEST TECHNOLOGY</th>
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<td>NQF Level</td>
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<td>NQF Credits</td>
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<td>Prerequisite</td>
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<td>Compulsory/Elective</td>
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<td>Semester Offered</td>
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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 its 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 student's 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).

<table>
<thead>
<tr>
<th>Module Title: GENERAL MICROBIOLOGY</th>
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<tr>
<td>Code</td>
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<td>NQF Level</td>
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<td>Compulsory/Elective</td>
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<td>Semester Offered</td>
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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).

<table>
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<tr>
<th>Module Title: HUMAN NUTRITION</th>
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<td>NQF Level</td>
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<td>Contact hours</td>
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<td>Compulsory/Elective</td>
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<td>Semester Offered</td>
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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 toxicity, 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.
Prerequisite NONE
Compulsory/Elective Compulsory
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
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: 3 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
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) Examination 60% (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.
AFST 3602: Food Technology

**Semester Offered:** 1

**Module Content:**

**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 378 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, coefficient 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
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-up 80%

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
assessments 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**

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<th>Code</th>
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<tr>
<td>NQF Level</td>
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<tr>
<td>NQF Credits</td>
<td>12</td>
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<tr>
<td>Contact hours</td>
<td>Three lectures per week for 14 weeks; 03 hours Practical every alternate week for 14 weeks</td>
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<tr>
<td>Prerequisite</td>
<td>Food Processing Technology AFSC 3791; Food Microbiology AFST 3791:</td>
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<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
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<td>Semester Offered</td>
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**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**

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<td>NQF Level</td>
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<td>NQF Credits</td>
<td>12</td>
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<tr>
<td>Contact hours</td>
<td>Three lectures per week for 14 weeks; 03 hrPractical every alternate week for 14 weeks</td>
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<tr>
<td>Prerequisite</td>
<td>None</td>
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<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
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<td>Semester Offered</td>
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**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**

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<tr>
<th>Code</th>
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<td>NQF Level</td>
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<td>NQF Credits</td>
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<tr>
<td>Contact hours</td>
<td>Two lectures per week for 14 weeks; 03 hours Practical for 3 hours every alternate week for 14 weeks</td>
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<tr>
<td>Prerequisite</td>
<td>AFST 3602 Food Technology; AFST 3791 Post Harvest Technology</td>
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<td>Compulsory/Elective</td>
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<td>Semester Offered</td>
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**Module Content:**
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.
Module Title: SEA FOODS TECHNOLOGY
Code: AFST 3862
NQF Level: 8
NQF Credits: 8
Contact hours: Two lectures per week for 14 weeks; 3 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 2 hr 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; 3 hours practical for every alternate week for 14 weeks.
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; 3 hours practical for every alternate week for 14 weeks.
Prerequisite: AFST 3781: Food Chemistry
Compulsory/Elective: Compulsory
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.

### 1.1 PROGRAMME SCHEDULE

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>NQF Level</th>
<th>Credits</th>
<th>Compulsory (C) / Elective (E)</th>
<th>(Co-requisite) / Pre-requisite</th>
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<tbody>
<tr>
<td><strong>Year 1 Semester 1</strong></td>
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<tr>
<td>UCLC 3509</td>
<td>Computer Literacy</td>
<td>5</td>
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<td>ULC 3419</td>
<td>English Communication and Study Skills</td>
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<td>UCSI 3580</td>
<td>Contemporary Social Issues</td>
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<td>SBLG 3511</td>
<td>Introduction to Biology</td>
<td>5</td>
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<td>SPHY 3501</td>
<td>Physics for Life Sciences I</td>
<td>5</td>
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<td><strong>Year 1 Semester 2</strong></td>
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<tr>
<td>ULEA 3519</td>
<td>English for Academic Purposes</td>
<td>5</td>
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<td>SCHM 3532</td>
<td>Chemistry for Life Sciences</td>
<td>5</td>
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<td>SBLG 3512</td>
<td>Diversity of Life</td>
<td>5</td>
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<td>SMAT 3512</td>
<td>Pre-calculus</td>
<td>5</td>
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<td>AAEC 3681</td>
<td>Principles of Microeconomics</td>
<td>6</td>
<td>12</td>
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<td>AAEC 3691</td>
<td>Rural Sociology</td>
<td>6</td>
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<td>AASC 3681</td>
<td>Genetics</td>
<td>6</td>
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<td>ACRS 3681</td>
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<td>7</td>
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<td>General Microbiology</td>
<td>6</td>
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<td>Ichthyology I</td>
<td>6</td>
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<td>Production Economics</td>
<td>6</td>
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<td>Introduction to Aquaculture</td>
<td>6</td>
<td>12</td>
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<td>Biochemistry</td>
<td>6</td>
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<td>Aquatic Chemistry</td>
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<td>AFAN 3682</td>
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<td>6</td>
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<td>AAACA 3701</td>
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<td>AFAP 3781</td>
<td>Physical Oceanography</td>
<td>6</td>
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<td>AFAS 3781</td>
<td>Aquaculture and Fisheries products</td>
<td>7</td>
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<td>AFAF 3781</td>
<td>Ichthyology II</td>
<td>7</td>
<td>12</td>
<td>C</td>
<td>AFAS 3682: Introduction to Aquaculture and AFAS 3602: Ichthyology I</td>
</tr>
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<td>AFAS 3791</td>
<td>Fisheries Management I</td>
<td>7</td>
<td>12</td>
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<td>AFAS 3602: Ichthyology I and AFAN 3682: Natural Resource Economics</td>
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<td>Course Title</td>
<td>Credits</td>
<td>Fees</td>
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<tr>
<td>AAEC 3781</td>
<td>Farm Planning and Management</td>
<td>7</td>
<td>12</td>
<td>Total Credits Semester 1 68</td>
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<td>Basic Aquaculture Engineering</td>
<td>7</td>
<td>12</td>
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<tr>
<td>AFAS 3792</td>
<td>Fisheries Management II</td>
<td>7</td>
<td>12</td>
<td>AFAS 3602: Ichthyology I and AFAN 3682: Natural Resource Economics</td>
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<td>AFAS 3712</td>
<td>Integrated Coastal Zone Management</td>
<td>7</td>
<td>16</td>
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<td>AFAS 3782</td>
<td>Aquaculture Nutrition and Feed Manufacturing</td>
<td>7</td>
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<td>ACSC 3792</td>
<td>Research Methods</td>
<td>7</td>
<td>12</td>
<td>ACRS 3681: Biostatistics</td>
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<tr>
<td>Course Code</td>
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<tr>
<td>AFAS 3831</td>
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<td>AFAS 3891</td>
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<tr>
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<tr>
<td>AFAS 3810</td>
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<td>AENE 3882</td>
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<tr>
<td>AFAS 3812</td>
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<td>AFAS 3832</td>
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<th>Total Credits Year 3</th>
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<tr>
<td>Total Credits Semester 2 60</td>
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<th>TOTAL CREDITS YEAR 4</th>
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<tr>
<td>TOTAL CREDITS FOR THE PROGRAMME 540</td>
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I.2 MODULE DESCRIPTORS

I.2.1 FIRST YEAR MODULES

CLC3509 COMPUTER LITERACY

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

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

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

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

<table>
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<tr>
<th>Code</th>
<th>CSI 3580</th>
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<tr>
<td>NQF level</td>
<td>5</td>
</tr>
<tr>
<td>Contact hours</td>
<td>Equivalent to 1 hour per week for two semesters (Online)</td>
</tr>
<tr>
<td>NQF Credits</td>
<td>8</td>
</tr>
<tr>
<td>Prerequisite</td>
<td>None (University Core Module)</td>
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<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
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<tr>
<td>Semester Offered</td>
<td>1 &amp; 2 (Year Module)</td>
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</table>

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.

<table>
<thead>
<tr>
<th>SBLG 3511: INTRODUCTION TO BIOLOGY</th>
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<tr>
<td><strong>Module title:</strong></td>
<td>INTRODUCTION TO BIOLOGY</td>
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<tr>
<td><strong>Code:</strong></td>
<td>SBLG 3511</td>
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<td><strong>Course Equivalent:</strong></td>
<td>Biology 1A</td>
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<tr>
<td><strong>NQF Level:</strong></td>
<td>4</td>
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<tr>
<td><strong>Contact hours:</strong></td>
<td>4 lectures/ week for 14 weeks and one 3-hour practical session per week.</td>
</tr>
<tr>
<td><strong>Credits:</strong></td>
<td>16</td>
</tr>
<tr>
<td><strong>Module assessment:</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Prerequisites:</strong></td>
<td>NSCC (Biology C or better)</td>
</tr>
<tr>
<td><strong>Module Content:</strong></td>
<td>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 domain 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.</td>
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<tr>
<th>SPHY 3501: PHYSICS FOR LIFE SCIENCES I</th>
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<tr>
<td><strong>Module title:</strong></td>
<td>PHYSICS FOR LIFE SCIENCES I</td>
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<tr>
<td><strong>Code:</strong></td>
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<tr>
<td><strong>NQF Level:</strong></td>
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<tr>
<td><strong>NPSC:</strong></td>
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<tr>
<td><strong>Contact hours:</strong></td>
<td>28 Lectures and 14 Practical Sessions/Tutorials</td>
</tr>
<tr>
<td><strong>Credits:</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>Module assessment:</strong></td>
<td>Continuous Assessment (50%) and 1 x 3-hour Exam Paper (50%). Continuous Assessment will consist of class tests, tutorial tests/assignments and practical reports.</td>
</tr>
<tr>
<td><strong>Pre-requisites:</strong></td>
<td>None</td>
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<tr>
<td><strong>Module Content:</strong></td>
<td>This module is to introduce Life science students to physics concepts and applications that will be useful to them in their undergraduate studies and career. 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.</td>
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<th>SMAT 3511: BASIC MATHEMATICS</th>
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<td><strong>Contact hours:</strong></td>
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<tr>
<td><strong>Credits:</strong></td>
<td>16</td>
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<tr>
<td><strong>Module Assessment:</strong></td>
<td>Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).</td>
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<tr>
<td><strong>Prerequisites:</strong></td>
<td>NSCC Mathematics</td>
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| **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.

<table>
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<tr>
<th>Module Title</th>
<th>LEA3519 ENGLISH FOR ACADEMIC PURPOSES</th>
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<td>NQF Level</td>
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<tr>
<td>Contact hours</td>
<td>4 periods per week for 14 weeks</td>
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<tr>
<td>Credits</td>
<td>16</td>
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<tr>
<td>Module assessment</td>
<td>Continuous assessment (60%): 2 tests (reading and writing), 1 academic written essay, 1 oral presentation</td>
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<td></td>
<td>Examination (40%): One three hour examination paper</td>
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<tr>
<td>Prerequisites</td>
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</tr>
<tr>
<td>Module Content</td>
<td>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.</td>
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<th>Module Title</th>
<th>SCHM 3532: CHEMISTRY FOR LIFE SCIENCES</th>
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<tbody>
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<td>SCHM3532</td>
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<tr>
<td>NQF Level</td>
<td>5</td>
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<tr>
<td>Contact Hours</td>
<td>56 hours of lectures, 42 hours of practical sessions</td>
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<tr>
<td>Credits</td>
<td>16</td>
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<tr>
<td>Module Assessment</td>
<td>CA: 50% (minimum 3 tests 80%, laboratory component 20%, tutorial assignments 10%). Final Exam: 50% (1 x 3 hour exam paper)</td>
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<tr>
<td>Prerequisites</td>
<td>None</td>
</tr>
<tr>
<td>Module Content</td>
<td>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, thioles, ethers; organic compounds of oxygen; common alcohols and phenols. Carboxylic acids and esters, amines and amides: Introduction to carbohydrates, lipids and porphyrins.</td>
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<th>Module Title</th>
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<tr>
<td>Code</td>
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<td>Course Equivalent</td>
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<td>Contact hours</td>
<td>4 lecture periods/ week for 14 weeks and one three hour practical session per week</td>
</tr>
<tr>
<td>Credits</td>
<td>16</td>
</tr>
<tr>
<td>Module assessment</td>
<td>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)</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>NSCC (Biology C or better)</td>
</tr>
<tr>
<td>Module Content</td>
<td>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</td>
</tr>
</tbody>
</table>
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, Prymophyta, Cryptophyta, Protozoan phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostome phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chordichthytes, 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 2 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: 3x1hr/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: 3x1hr/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**
Course Code: AASC 3681  
NQF Level: 6  
Contact hours: Lectures: 3x1hr/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:

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**

**Assessment Strategies**
Continuous Assessment: 40% (minimum of 2 tests, 1 marked assignment and 3 practicals); Examination: 60% (1 x 2 hr paper)

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**Module Title:** ICHTHYOLOGY I

**Course 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)

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**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/UV 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).

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**Module Title:** BIOSTATISTICS

**Course 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
Module Content

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

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)
Course content
Aquaculture and Fisheries Products; Fish from farm/sea to the table; storage and slaughtering 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 Compulsory
Semester Offered 1

Module Content:

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

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:
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 (56hrs); 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:

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 of 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:
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:

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)  
(Oongo 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

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Course Code</th>
<th>NQF Level</th>
<th>Credits</th>
<th>Compulsory</th>
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### Year 4

#### Forestry Option

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**Credits Year 4:** 126

**Total Credits:** 544

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#### Environmental Science Option

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<td>Environment &amp; Development</td>
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**Credits Year 4:** 130

**Total Credits:** 548

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### J.2 MODULE DESCRIPTORS

#### J.2.1 FIRST YEAR MODULES

**CLC 3509 COMPUTER LITERACY**

<table>
<thead>
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<tr>
<td>NQF level:</td>
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<tr>
<td>Contact hours:</td>
<td>1 lecture theory and 1 lecture practical per week for 14 weeks</td>
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<td>Credits:</td>
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<tr>
<td>Module assessment:</td>
<td>Continuous Assessment 100% 2 Practical Tests 50%, 2 Theory Tests 50%</td>
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<td>Prerequisites:</td>
<td>University Entry</td>
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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. 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: SB LG 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% Practical (not less than 10 marked assignment), 60% Examination (60%): 3 hour examination paper.
Pre-requisites: 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 domain 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**

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<td>Contact hours</td>
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<td>Prerequisite</td>
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**Module Content:**

Sets: notations and diagrams to represent sets, subset, empty set, equality of sets, intersection, union, complement. Algebraic expressions: simplification, expansion, polynomials, remainder 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.

**LEA 3519 ENGLISH FOR ACADEMIC PURPOSES**

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<td>Prerequisites</td>
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**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; molality, 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; stereoisomerism. 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.

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**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)  
**Pre-requisites:** NSSC (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, Protostome phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostome phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placodermens, Chondrichthyes, Actinopterygii, Actinista, 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**

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<tr>
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<td>Credits:</td>
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<td>Assessment:</td>
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<tr>
<td>Prerequisite:</td>
<td>NSSC Mathematics</td>
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**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**

<table>
<thead>
<tr>
<th>Code:</th>
<th>AAEC 3681</th>
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<tbody>
<tr>
<td>NQF level:</td>
<td>6</td>
</tr>
<tr>
<td>Contact hours:</td>
<td>Lectures: 3x 1hr L/wk for 14 weeks (42hrs)</td>
</tr>
<tr>
<td>NQF Credits:</td>
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<tr>
<td>Prerequisites:</td>
<td>None</td>
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<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Semester Offered:</td>
<td>1</td>
</tr>
</tbody>
</table>

**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**

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<td>Compulsory</td>
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<tr>
<td>Semester Offered:</td>
<td>2</td>
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</tbody>
</table>

**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/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)

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**Module Title:** GENETICS  
**Code:** AASC 3681  
**NQF level:** 6  
**Contact hours:** Lectures: 3x 1hr/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 hour paper).

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**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:**  

**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:

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
Prerequisites: 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: 4 x 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 Tricularic 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. 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% (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:

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)
Module Title: INTRODUCTION TO PLANT TAXONOMY
Code: AIED 3761
NQF level: 7
Contact hours: Lectures: 3 x 1 hr/wk for 14 weeks (42 hrs); Practicals: 1 x 3 hr alternate for 14 weeks (21 hrs)
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 Namibia including; 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)

J.2.3 THIRD YEAR MODULES

Module Title: DRYLAND PLANTS
Code: AIED 3781
NQF level: 7
Contact hours: Lectures: 3 x 1 hr/wk for 14 weeks (42 hrs); Practicals: 1 x 3 hr alternate for 14 weeks (21 hrs)
NQF Credits: 12
Prerequisites: None
Compulsory/Elective: Compulsory
Semester offered: 1

Module Content:

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

Module Title: PRINCIPLES OF WILDLIFE MANAGEMENT
Code: AIEP 3781
NQF level: 7
Contact hours: Lectures: 3 x 1 hr/wk for 14 weeks (42 hrs); Practicals: 1 x 3 hr alternate for 14 weeks (21 hrs)
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; colony; 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
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
Prerequisite: 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 Namibia and the SADC region – case studies.

Module Title: BIOSTATISTICS
Code: ACRS 3681
NQF Level: 7
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

Module Content:

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

Module Content:

Assessment Strategies
Continuous assessment (40%): at least three assessments; Examination (60%): 01 x 02 hour examination paper
<table>
<thead>
<tr>
<th>Module Title:</th>
<th>NATURE CONSERVATION</th>
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<tr>
<td>Code</td>
<td>A1EN 3792</td>
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<tr>
<td>NQF level</td>
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<tr>
<td>Contact hours</td>
<td>Lectures: 3 x 1hr/wk for 14 weeks (42 hrs); Practical: 1 x 3 hr/wk alternate for 14 weeks (21 hrs)</td>
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<td>Compulsory</td>
</tr>
<tr>
<td>Semester offered</td>
<td>2</td>
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</table>

**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)

<table>
<thead>
<tr>
<th>Module Title:</th>
<th>GEO-INFORMATICS</th>
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<tbody>
<tr>
<td>Code</td>
<td>A1ES 3791</td>
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</tr>
<tr>
<td>Semester offered</td>
<td>2</td>
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**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)

<table>
<thead>
<tr>
<th>Module Title:</th>
<th>COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT</th>
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<td>Code</td>
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<td>Contact hours</td>
<td>Lectures: 2 x 1hr/wk for 14 weeks (28hrs); Practical: 1 x 2 hr alternate for 14 weeks (14hrs)</td>
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<tr>
<td>NQF Credits</td>
<td>8</td>
</tr>
<tr>
<td>Pre prerequisite</td>
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</tr>
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</table>

**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 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 1hr/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 explores 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)
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 includes 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); Practical: 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:

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); Practical: 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 1 hr/ wk for 14 weeks (42 hrs);  
Practicals: 1 x 2 hr alternate for 14 weeks (14 hrs)  
**NQF Credits**: 12  
**Pre requisite**: None  
**Compulsory/Elective**: Compulsory  
**Semester offered**: 1  

**Module Content:**  

**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: 3 x 1 hr/L/W for 14 weeks (42 hrs);  
Practicals: 1 x 1 hr Pract/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 1 hr/wk for 14 weeks (42 hrs);  
Practicals: 1 x 2 hr alternate for 14 weeks (14 hrs)  
**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 sampling 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: FORESTECONOMICS 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:

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:

Assessment strategies
Continuous assessment: 40% (At least three assessments); Exam: 60% (1 x 3 hr paper)
Module Title: RESEARCH PROJECT (ENVIRONMENTAL SCIENCE)

- **Code**: AENV 3810
- **NQF level**: 8
- **Contact hours**: Consultation: 1 x 1 hr/wk for 28 weeks (28 hrs)
- **NQF Credits**: 32
- **Prerequisite**: 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 includes 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: 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 1 hr/wk for 14 weeks (42hrs); Practical: 1 x 2 hr/wk for 14 weeks (28hrs)
- **NQF Credits**: 12
- **Prerequisite**: 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:

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

Module Title: WATER SHED 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:

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)
Module Content:

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); Practical: 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 of 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); Practical: 1 x 2hr/wk for 14 weeks (28hrs)
NQF Credits 12
Pre requisite None
Compulsory/Elective Compulsory
Semester offered 2

Module Content:

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

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>NQF Level</th>
<th>Credits</th>
<th>Compulsory (C) / Elective (E)</th>
<th>(Co-requisite) / Pre-requisite</th>
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<td>UCLC 3509</td>
<td>Computer Literacy</td>
<td>5</td>
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<tr>
<td>ULLC 3419</td>
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<td>4</td>
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<tr>
<td>SBLG 3511</td>
<td>Introduction to Biology</td>
<td>4</td>
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<tr>
<td>HGHE 3581</td>
<td>Fundamentals of Physical Geography</td>
<td>5</td>
<td>12</td>
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<tr>
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<td>Basic Mathematics</td>
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<td>Diversity of Life</td>
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<td>AWLM 3741</td>
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<td>AWLM 3712</td>
<td>Animal Behaviour</td>
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2020 FANR PROSPECTUS
### Year 4 Semester 1

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<th>Module Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Contact Hours</th>
<th>Prerequisites</th>
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<tr>
<td>AWLM 3801</td>
<td>Freshwater Ichthyology &amp; Aquaculture</td>
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<td>AWLM 3811</td>
<td>Entomology</td>
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<td>Economics of Wildlife Resources</td>
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<td>AWLM 3601: Wildlife Management</td>
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<td>AWLM 3881</td>
<td>Environmental Impact Analysis</td>
<td>8</td>
<td>12</td>
<td>AWLM 3632: Wildlife Ecology</td>
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<tr>
<td>ACA 3801</td>
<td>Field Attachment II</td>
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<td>AWLM 3810</td>
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<td>AWLM 3802</td>
<td>Ecotourism Marketing and Travel Plan Development</td>
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<td>AWLM 3822</td>
<td>Wildlife in Agriculture Ecosystems</td>
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<td>AWLM 3862</td>
<td>Biogeography</td>
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<td>AWLM 3662: Geo-Informatics for WLM</td>
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<td>AWLM 3841</td>
<td>Digital Wildlife Photography</td>
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<td>AWLM 3842</td>
<td>Environmental &amp; Ecotourism Education</td>
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<td>ACSI 3580: Contemporary Social Issues</td>
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### TOTAL CREDITS YEAR 4

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<td>Total credits</td>
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</table>

### TOTAL CREDITS FOR THE PROGRAMME

|                    | 534                          |

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**K.2 MODULE DESCRIPTORS**

**K.2.1 FIRST YEAR MODULES**

**CLC 3509 COMPUTER LITERACY**

- **Module title:** COMPUTER LITERACY
- **Code:** CLC 3509
- **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.
**LC E3419 ENGLISH COMMUNICATION & STUDY SKILLS**

<table>
<thead>
<tr>
<th>Module title:</th>
<th>ENGLISH COMMUNICATION AND STUDY SKILLS</th>
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<tbody>
<tr>
<td>Code:</td>
<td>LCE3419</td>
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<tr>
<td>NQF level:</td>
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<tr>
<td>Contact hours:</td>
<td>4 hours per week for 14 weeks</td>
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<td>Credits:</td>
<td>16</td>
</tr>
<tr>
<td>Module Assessment:</td>
<td>Continuous assessment (60%): two tests (reading and writing), two reading assignments, one oral presentation</td>
</tr>
<tr>
<td>Pre-requisites:</td>
<td>None</td>
</tr>
<tr>
<td>Module Content:</td>
<td>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.</td>
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**SBLG 3511: INTRODUCTION TO BIOLOGY**

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<tbody>
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<td>Code:</td>
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<tr>
<td>Course Equivalent:</td>
<td>Biology 1A</td>
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<td>NQF level:</td>
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<tr>
<td>Contact hours:</td>
<td>4 lectures/ week for 14 weeks and one 3-hour practical session per week.</td>
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<tr>
<td>Credits:</td>
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<tr>
<td>Module assessment:</td>
<td>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.</td>
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<tr>
<td>Prerequisites:</td>
<td>NSCC (Biology C or better)</td>
</tr>
<tr>
<td>Module Content:</td>
<td>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 domain 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.</td>
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**HGHE 3581: FUNDAMENTALS OF PHYSICAL GEOGRAPHY**

<table>
<thead>
<tr>
<th>Module name:</th>
<th>FUNDAMENTALS OF PHYSICAL GEOGRAPHY</th>
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<tbody>
<tr>
<td>Proposed NQF Level:</td>
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<tr>
<td>Credits:</td>
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<tr>
<td>Contact Hours:</td>
<td>3 hours/weeks over 14 weeks = 42 contact hours</td>
</tr>
<tr>
<td>Module Content:</td>
<td>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.</td>
</tr>
<tr>
<td>Assessment:</td>
<td>Continuous assessment 60% : Examination 40% (1 x 3 hour examination paper)</td>
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**SMAT 3511: BASIC MATHEMATICS**

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<td>Contact hours:</td>
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<td>Credits:</td>
<td>16</td>
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172 2020 FANR PROSPECTUS
Module Assessment: Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination 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, remainder 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: alkenes; aldehydes and alkenes; 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.

**SBGL 3512: DIVERSITY OF LIFE**

**Module title:** DIVERSITY OF LIFE  
**Code:** SBGL 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 than 10 marked assignments) 50% Examination: 60% (1 x 2 hour examination paper)  
**Prerequisites:** NSSC (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, Protonemata phyla: Nemertea, Mollusca, Annelida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostome phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placodermes, Chondrichthyes, 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 descriptions 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:**


**Assessment strategies**
Continuous assessment: 50% (at least 2 tests, practical assessments); Exam: 50% (1 x 3 hr paper).

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**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:**

**Assessment strategies**
Continuous assessment: 40% (at least three assessments); Exam: 60% (1 x 2 hr paper)

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**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:** hgte3511: 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)

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**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:**
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. Interspecific 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:

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:

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:

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:

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: CLC 3409: 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); Practicals: 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:

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)

<table>
<thead>
<tr>
<th>Module Title</th>
<th>Code</th>
<th>NQF Level</th>
<th>Contact Hours</th>
<th>NQF Credits</th>
<th>Prerequisite</th>
<th>Compulsory/Elective</th>
<th>Semester Offered</th>
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<tbody>
<tr>
<td>WILDLIFE CONSERVATION</td>
<td>AWLM 3781</td>
<td>7</td>
<td>Lectures: 3 X 1hr/Wk For 14 Weeks (42hrs); Practicals: 1 X 3hr Alternate For 14 Weeks (21hrs)</td>
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Module Content:

Assessment strategies
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 3 hr paper)

<table>
<thead>
<tr>
<th>Module Title</th>
<th>Code</th>
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<th>Contact Hours</th>
<th>NQF Credits</th>
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<tr>
<td>ECOLOGICAL METHODS IN WILDLIFE STUDIES</td>
<td>AWLM 3721</td>
<td>7</td>
<td>Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)</td>
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<td>AWLM3611: Wildlife Ecology</td>
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Module Content:

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)
### Module Title: NATIONAL PARKS & GAME RESERVES

<table>
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<tr>
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<td>NQF Credits</td>
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<tr>
<td>Co-Requisite</td>
<td>Awlm3781: Wildlife Conservation</td>
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<td>Compulsory/Elective</td>
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<tr>
<td>Semester Offered</td>
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</tbody>
</table>

**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

<table>
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<tr>
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<tr>
<td>NQF Level</td>
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<tr>
<td>Contact Hours</td>
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<tr>
<td>NQF Credits</td>
<td>16</td>
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<tr>
<td>Prerequisite</td>
<td>Awlm3682: Ornithology; Awlm3602: Mammalogy</td>
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<td>Semester Offered</td>
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</tbody>
</table>

**Module Content**


**Assessment strategies**

Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 3 hr paper)

### Module Title: GENETIC CONSERVATION

<table>
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<tr>
<th>Code</th>
<th>AWLM 3702</th>
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<td>NQF Level</td>
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<tr>
<td>Co-Requisite</td>
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<td>Semester Offered</td>
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</table>

**Module Content**


**Assessment strategies**

Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 2 hr paper)

### Module Title: WILDLIFE SURVEY & MONITORING TECHNIQUES

<table>
<thead>
<tr>
<th>Code</th>
<th>AWLM 3722</th>
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<td>Contact Hours</td>
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<tr>
<td>Prerequisite</td>
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</tr>
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<td>Compulsory/Elective</td>
<td>Compulsory</td>
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<tr>
<td>Semester Offered</td>
<td>2</td>
</tr>
</tbody>
</table>
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:

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:

Assessment strategies
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 3 hr paper)
Course Title: RESEARCH 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:

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:

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:

Assessment strategies
Continuous assessment: 50% (at least three tests, practical assessments); Exam: 50% (1 x 3 hr paper)
<table>
<thead>
<tr>
<th>Module Title:</th>
<th>ECONOMIC OF WILDLIFE RESOURCES</th>
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<tbody>
<tr>
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<td>AWLM 3821</td>
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<td>NQF Level</td>
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<tr>
<td>Contact Hours</td>
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<tr>
<td>NQF Credits</td>
<td>8</td>
</tr>
<tr>
<td>Prerequisite</td>
<td>Awlm3601: Wildlife Management</td>
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<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
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<td>Semester Offered</td>
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</table>

**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)

<table>
<thead>
<tr>
<th>Module Title:</th>
<th>ENVIRONMENTAL IMPACT ANALYSIS</th>
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<tr>
<td>Code</td>
<td>AENE 3881</td>
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<td>NQF Level</td>
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<td>Contact Hours</td>
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<td>NQF Credits</td>
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<tr>
<td>Prerequisite</td>
<td>Awlm3611: Wildlife Ecology</td>
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<td>Semester Offered</td>
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**Module Content:**

**Assessment strategies**
Continuous assessment: 50% (at least three assessments); Exam: 50% (1 x 2 hr paper)

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<th>FIELD ATTACHMENT II</th>
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<tr>
<td>Semester Offered</td>
<td>1</td>
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</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Module Title:</th>
<th>ECOTOURISM MARKETING AND TRAVEL PAN DEVELOPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>AWLM 3802</td>
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<td>NQF Level</td>
<td>8</td>
</tr>
<tr>
<td>Contact Hours</td>
<td>Lectures: 2 X 1hr/Wk For 14 Weeks (28hrs); Practicals: 1 X 2hr Alternate For 14 Weeks (14hrs)</td>
</tr>
<tr>
<td>NQF Credits</td>
<td>8</td>
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<tr>
<td>Prerequisite</td>
<td>None</td>
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<tr>
<td>Compulsory/Elective</td>
<td>Compulsory</td>
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<td>Semester Offered</td>
<td>2</td>
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**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 3822
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:

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:

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:**

**Assessment strategies**
Continuous assessment: 50% (at least two tests, practical assessments); Exam: 50% (1 x 2 hr paper)

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**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 a score of 3 or better at 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 (LC E3419) 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 of 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 by the end of the 3rd year
- 392 credits by the end of the 4th year
- 488 credits by the end of the 5th year
- 584 credits by the end of the 6th year
- 682 credits by 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 who did not pass all first, second, third, fourth and fifth year modules, 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:

<table>
<thead>
<tr>
<th>Year</th>
<th>Maximum Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>152 credits</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
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<td>5</td>
<td>162 credits</td>
</tr>
<tr>
<td>6</td>
<td>140 credits</td>
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</table>

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
<table>
<thead>
<tr>
<th>MODULE CODE</th>
<th>MODULE TITLE</th>
<th>NQF LEVEL</th>
<th>L</th>
<th>P</th>
<th>CREDITS</th>
<th>PRE-REQUISITES</th>
<th>CO-REQUISITES</th>
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</thead>
<tbody>
<tr>
<td>PHY 3501</td>
<td>Physics for Life Science</td>
<td>5</td>
<td>02/28</td>
<td>21</td>
<td>8</td>
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<tr>
<td>LEA 3519</td>
<td>English for Academic Purposes</td>
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<td>04/56</td>
<td>16</td>
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<td>CSI 3580</td>
<td>Contemporary Social Issues</td>
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<td>02/28</td>
<td>8</td>
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<td>BLG 3511</td>
<td>Introduction to Biology</td>
<td>5</td>
<td>04/56</td>
<td>42</td>
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<tr>
<td>MAT 3511</td>
<td>Basic Mathematics</td>
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<td>04/56</td>
<td>28</td>
<td>16</td>
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<td>BVB 3511</td>
<td>Veterinary Anatomy, Histology and Embryology</td>
<td>5</td>
<td>07/98</td>
<td>16</td>
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**Semester 2**

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<th>CREDITS</th>
<th>PRE-REQUISITES</th>
<th>CO-REQUISITES</th>
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<tbody>
<tr>
<td>BVM 3552</td>
<td>Veterinary Physiology I</td>
<td>5</td>
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<td>BVB 3512</td>
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<td>07/98</td>
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<td>BVB 3502</td>
<td>Veterinary Histology and Embryology</td>
<td>5</td>
<td>05/70</td>
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<td>CLC 3509</td>
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<tr>
<td>BVB 3532</td>
<td>Veterinary Biochemistry</td>
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<td>BVM 3542</td>
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# YEAR 2 (148 CREDITS)

## Semester 1

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<tbody>
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<td>02/28</td>
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<td>BVM 3611</td>
<td>Veterinary Physiology II</td>
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<td>04/56</td>
<td>42</td>
<td>16</td>
<td>BVM 3552</td>
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<td>BVM 3651</td>
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<td>6</td>
<td>04/56</td>
<td>42</td>
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Total Semester 1 credits: 72

## Semester 2

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<td>7/98</td>
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<td>BVM 3612</td>
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<td>04/56</td>
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<td>Animal Production</td>
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<td>BVM 3642</td>
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Total Semester 2 credits: 76

Total Year 2 credits: 148
## Semester 1

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<td>7</td>
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<td>BVB 3651, BVM 3622, BVM 3602</td>
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<td>BVM 3711</td>
<td>Infectious Diseases I</td>
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<td>02/56</td>
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<td>BVM 3740</td>
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## Semester 2

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<th>MODULE TITLE</th>
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<th>CREDITS</th>
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<th>CO-REQUISITES</th>
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<tbody>
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### YEAR 4 (152 CREDITS)

#### Semester 1

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<td>8</td>
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Total Semester 1 credits: 72

#### Semester 2

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Total Semester 2 credits: 80
### YEAR 5 (162 CREDITS)

#### Semester 1

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Total Semester 1 credits: 76

#### Semester 2

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Total Semester 2 credits: 90
### YEAR 6 (140 CREDITS)

#### Semesters 1 & 2

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<td>including dairy and beef HH</td>
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<td>Companion Animal Clinical Studies surgery/anaesthetics</td>
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<td>Exotic animals, Fish and Bee Medicine, Wildlife capture, Community veterinary</td>
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<td>clinic, Equine, Veterinary Laboratory, Nutrition, Semen freezing, Pigs, Poultry, own choice (selected from above compulsory module list)</td>
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<td><strong>Total Semester 2 credits:</strong></td>
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<td>140</td>
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</table>

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
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**

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**L.10 MODULE DESCRIPTORS**

**L.10.1 FIRST YEAR MODULES**

**PHY 3501 PHYSICS FOR LIFE SCIENCES**

<table>
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<th>Module Title:</th>
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<tr>
<td>Code:</td>
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<td>NQF Level:</td>
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| 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)

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**MAT3511 BASIC MATHEMATICS**

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<td>Contact hours:</td>
<td>Lectures: 4 x 1hr / week for 14 weeks (56 hrs)</td>
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<td>Tutorials: 1 x 2hr / week for 14 weeks (28hrs)</td>
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<tr>
<td>Semester Offered:</td>
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**Module Contents:**

**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 $\mathbb{R}$ 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%)

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**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

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**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%).
**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 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 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, malonyl 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
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 practices. 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 animals 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.

**Assessment Strategies**
Continuous Assessment: minimum 3 theory assessments and at least 3 marked practical assessments
Examination: 1 x 2hr paper

**BVC 3611 VETERINARY MICROBIOLOGY**

<table>
<thead>
<tr>
<th>Module Title: VETERINARY MICROBIOLOGY</th>
<th>Code: BVC 3611</th>
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</thead>
<tbody>
<tr>
<td>NQF Level: 6</td>
<td></td>
</tr>
<tr>
<td>Contact Hours:</td>
<td>Lectures: 4 x 1hr / week</td>
</tr>
<tr>
<td></td>
<td>Practicals: 1 x 3hr / alternate week each</td>
</tr>
<tr>
<td>NQF Credits: 16</td>
<td></td>
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<tr>
<td>Pre-requisites:</td>
<td>BLG 3511</td>
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<tr>
<td>Co-requisite: None</td>
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<td>Compulsory / Elective: Compulsory</td>
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<tr>
<td>Semester Offered:</td>
<td>1</td>
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</tbody>
</table>

**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.
- 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 2hr paper

**BVM 3631 APPLIED COMPANION ANIMAL ANATOMY**

<table>
<thead>
<tr>
<th>Module Title: APPLIED COMPANION ANATOMY</th>
<th>Code: BVM 3631</th>
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<tbody>
<tr>
<td>NQF Level: 6</td>
<td></td>
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<tr>
<td>Contact Hours: 7 hours of integrated theory and practicals/ week each semester</td>
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<td>NQF Credits: 16</td>
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<tr>
<td>Pre-requisites: BVB 3511, BVB 3512, BVB 3502</td>
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<tr>
<td>Co-requisite: None</td>
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<td>Compulsory / Elective: Compulsory</td>
<td></td>
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<tr>
<td>Semester Offered: 1</td>
<td></td>
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</tbody>
</table>

**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
**BVM 3602 VETERINARY IMMUNOLOGY AND VACCINOLOGY**

<table>
<thead>
<tr>
<th>Module Title:</th>
<th>VETERINARY IMMUNOLOGY AND VACCINOLOGY</th>
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<tbody>
<tr>
<td>Code:</td>
<td>BVM 3602</td>
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<td>Contact Hours:</td>
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<td>Practicals: 1 x 3hr practical / alternate week each semester</td>
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<tr>
<td>NQF Credits:</td>
<td>8</td>
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<tr>
<td>Pre-requisites:</td>
<td>None</td>
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<tr>
<td>Co-requisites:</td>
<td>BVM 3601</td>
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<tr>
<td>Compulsory / Elective:</td>
<td>Compulsory</td>
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<tr>
<td>Semester Offered:</td>
<td>2</td>
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</tbody>
</table>

**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

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**BVM 3632 APPLIED PRODUCTION ANIMAL ANATOMY**

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<tr>
<th>Module Title:</th>
<th>APPLIED PRODUCTION ANIMAL ANATOMY</th>
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<tbody>
<tr>
<td>Code:</td>
<td>BVM 3632</td>
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<tr>
<td>NQF Level:</td>
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<tr>
<td>Contact Hours:</td>
<td>7 hours of integrated theory and practicals/ week each semester</td>
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<td>NQF Credits:</td>
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<td>Pre-requisites:</td>
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<td>Co-requisite:</td>
<td>None</td>
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<tr>
<td>Compulsory / Elective:</td>
<td>Compulsory</td>
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<td>Semester Offered:</td>
<td>2</td>
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</table>

**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%)

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**BVM 3652 VETERINARY PARASITOLOGY II**

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<tr>
<th>Module Title:</th>
<th>VETERINARY PARASITOLOGY II</th>
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<tr>
<td>Code:</td>
<td>BVM 3652</td>
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<tr>
<td>NQF Level:</td>
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<tr>
<td>Contact Hours:</td>
<td>Lecture: 4 x 1hr / week each semester</td>
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<td>Practical: 1 x 3 hrs / week each semester</td>
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<tr>
<td>Pre-requisites:</td>
<td>BLG 3511</td>
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<td>Co-requisite:</td>
<td>None</td>
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<td>Compulsory / Elective:</td>
<td>Compulsory</td>
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<tr>
<td>Semester Offered:</td>
<td>2</td>
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</tbody>
</table>
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

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**BVM 3642 BIOMETRY**

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<th>Module Title</th>
<th>BIOMETRY</th>
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<tbody>
<tr>
<td>Code:</td>
<td>BVM 3642</td>
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<tr>
<td>NQF Level:</td>
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<tr>
<td>Contact Hours:</td>
<td>Lectures: 2 x 1hr/ week each semester</td>
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<tr>
<td></td>
<td>Tutorials: 1 x 1hr/ week each semester</td>
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<tr>
<td>NQF Credits:</td>
<td>8</td>
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<tr>
<td>Pre-requisites:</td>
<td>MAT3511</td>
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<tr>
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<td>Compulsory / Elective:</td>
<td>Compulsory</td>
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<tr>
<td>Semester Offered:</td>
<td>2</td>
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</tbody>
</table>

**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

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**BVM 3609 FIELD PRACTICAL TRAINING I: LABORATORY**

<table>
<thead>
<tr>
<th>Module Title:</th>
<th>FIELD PRACTICAL TRAINING I: LABORATORY</th>
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<tbody>
<tr>
<td>Code:</td>
<td>BVM 3609</td>
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<tr>
<td>NQF Level:</td>
<td>6</td>
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<tr>
<td>Contact hours:</td>
<td>1 week</td>
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<td>NQF Credits:</td>
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<td>None</td>
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<td>Compulsory/Elective:</td>
<td>Compulsory</td>
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<tr>
<td>Semester Offered:</td>
<td>1 or 2</td>
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</table>

**Module Contents:**
Students will visit registered veterinary diagnostic laboratories to participate in daily activities and management of operations.

**Assessment Strategies:**
Continuous Assessment: 100%

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**L.10.3 THIRD YEAR MODULES**

**BVM 3700 VETERINARY PHARMACOLOGY**

<table>
<thead>
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<th>Module Title:</th>
<th>VETERINARY PHARMACOLOGY</th>
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<tr>
<td>Code:</td>
<td>BVM 3700</td>
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**2020 FANR PROSPECTUS**
**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

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**BVM 3721 HERD HEALTH MANAGEMENT AND ECONOMICS I**

**Module Title:** BVM 3721 HERD HEALTH MANAGEMENT AND ECONOMICS I

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>NQF Level</td>
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<tr>
<td>Contact Hours</td>
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<tr>
<td>Contact Hours</td>
<td>Practical: 1x3 hrs/ alternate week each semester</td>
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<td>NQF Credits</td>
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<td>Pre-requisites</td>
<td>BVB 3671, BVM 3622, BVM 3602</td>
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<tr>
<td>Co-requisite</td>
<td>None</td>
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<tr>
<td>Compulsory / Elective</td>
<td>Compulsory</td>
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<tr>
<td>Semester Offered</td>
<td>1</td>
</tr>
</tbody>
</table>

**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/week each semester  
Practicals: 1 x 3hr/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

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**BVM 3740 VETERINARY TOXICOLOGY**

**Module Title:** VETERINARY TOXICOLOGY  
**Code:** BVM 3740  
**NQF Level:** 7  
**Contact Hours:** Lectures: 2 x 1hr/week each semester  
Practicals: 1 x 3hr/week each semester  
**NQF Credits:** 8  
**Pre-requisites:** BVB 3532, BVM 3611  
**Co-requisite:** BVM 3720  
**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%)

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**BVM 3781 ETHNO-VETERINARY MEDICINE**

**Module Title:** ETHNO-VETERINARY MEDICINE  
**Code:** BVM 3781  
**NQF Level:** 7  
**Contact Hours:** Lectures: 1hr/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.

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**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
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

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### 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, BVC 3611

**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%)

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### BVM 3712 INFECTIOUS DISEASES II

**Module Title:** INFECTIOUS DISEASES II

**Code:** BVM 3712

**NQF Level:** 7

**Contact Hours:**
- Lecture: 1x4hrs / 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

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### 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: 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 Practical) 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
**BVM 3811 VETERINARY PUBLIC HEALTH I**

**Module Title:** VETERINARY PUBLIC HEALTH I  
**Code:** BVM 3811  
**NQF Level:** 8  
**Contact Hours:** Lecture: 1x4hrs/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%)

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**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, BVM 3712, BVM 3731, BVM 3740  
**Co-requisite:** BVC 3832  
**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 2hr Practical exam (40%)

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**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  

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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 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 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  
**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%)

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**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
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: BVC 3831
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 gastrointestinal, 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%)

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, BVM 3732
Co-requisite: None
Compulsory/Elective: Compulsory
Semester 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%)

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
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, BVM 3821
Co-requisites: BVC 3872
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: BVC 3872
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 gastrointestinal 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 be 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 (60%)

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 OBSTETRICS I
Module Code: BVM 3871
NQF Level: 8
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
**BVC 3852 COMPANION ANIMALS CLINICAL STUDIES IV**

**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%)

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**BVM 3832 THERIOGENOLOGY II**

**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%)

---

Co-requisite: BVC 3871
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

<table>
<thead>
<tr>
<th>Module Title:</th>
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<tbody>
<tr>
<td>Code:</td>
<td>BVM 3880</td>
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<tr>
<td>NQF Level:</td>
<td>8</td>
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<tr>
<td>Contact Hours:</td>
<td>Lectures: 2 x 1hr lecture per week</td>
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<td>NQF Credits:</td>
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<td>Pre-requisites:</td>
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<td>Compulsory / Elective:</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Semester Offered:</td>
<td>1 &amp; 2</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Code:</td>
<td>BVC 3890</td>
</tr>
<tr>
<td>NQF Level:</td>
<td>8</td>
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<tr>
<td>Contact Hours:</td>
<td>45 weeks starting December of the fifth year</td>
</tr>
<tr>
<td>NQF Credits:</td>
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<td>None</td>
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<tr>
<td>Compulsory / Elective:</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Semester Offered:</td>
<td>1 &amp; 2</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>FIRST YEAR</th>
<th>MODULE CODE</th>
<th>MODULE TITLE</th>
<th>NOF LEVEL</th>
<th>P</th>
<th>CREDITS</th>
<th>COMPULSORY/ ELECTIVE</th>
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<td>UAE 5819</td>
<td>Academic Writing for Postgraduate Students</td>
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<td>16</td>
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<td></td>
<td>ASC 5900</td>
<td>Research/ Exp Design &amp; Analysis</td>
<td>9</td>
<td>2</td>
<td>8</td>
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<tr>
<td></td>
<td>ASC 5920</td>
<td>Geographic Info Systems &amp; Remote Sensing</td>
<td>9</td>
<td>1</td>
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<td></td>
<td>ASC 5981</td>
<td>Intro Integrated Resource Management</td>
<td>9</td>
<td>7</td>
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<td></td>
<td>ASC 5991</td>
<td>Rangeland Ecosystem Structure &amp; Function</td>
<td>9</td>
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<td></td>
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<td>Soil Dynamics</td>
<td>9</td>
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<td>9</td>
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<td>Fodder Flow</td>
<td>9</td>
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<td>Research/ Exp Design &amp; Analysis</td>
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<td></td>
<td>ASC 5992</td>
<td>Rangeland Degradation and Its Mitigation</td>
<td>9</td>
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<td></td>
<td>ASN 5982</td>
<td>Nutrition of Foraging Animals</td>
<td>9</td>
<td>7</td>
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<td></td>
<td>ASS 5982</td>
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<td>9</td>
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222 2020 FANR PROSPECTUS
SECOND YEAR

<table>
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<th>COMPULSORY / ELECTIVE</th>
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Semester 2

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<th>COMPULSORY / ELECTIVE</th>
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<tr>
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<td>ASC 5910 Research Project / Thesis</td>
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TOTAL SECOND YEAR CREDITS: 128

TOTALS: 340

M.7  MODULE DESCRIPTORS

M.7.1  FIRST YEAR MODULES

AASC 5900: RESEARCH / EXPERIMENTAL DESIGN AND ANALYSIS

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**

<table>
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<th>GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING</th>
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<tr>
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<tr>
<td>Contact Hours</td>
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<td>Credits</td>
<td>16</td>
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<td>Modules Assessment</td>
<td>Assessment: CA [50%] at least 5 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.</td>
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<tr>
<td>CA:</td>
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<td>Exam:</td>
<td>50%</td>
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<tr>
<td>Prerequisites</td>
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**Module Content:**
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**

<table>
<thead>
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<th>INTRODUCTION TO INTEGRATED RESOURCES MANAGEMENT</th>
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<tbody>
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<td>AASC 5981</td>
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<tr>
<td>NQA Level</td>
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<tr>
<td>Lecturers/week</td>
<td>40 (4 weeks) compulsory</td>
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<td>Credits</td>
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</tr>
<tr>
<td>CA:</td>
<td>50%</td>
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<tr>
<td>Exam:</td>
<td>50%</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>None</td>
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</tbody>
</table>

**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: AASC 5991
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: AASD 5981
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 wildlife; 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
NQA Level: 9
Contact Hours: 4 weeks (40 Contact Hours) Compulsory
Credits: 12

Modules 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 kemel), 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 comoros, 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

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<thead>
<tr>
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<th>RANGELAND DEGRADATION AND ITS MITIGATION</th>
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<tr>
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<td>Credits</td>
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</table>

**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

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<thead>
<tr>
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**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.
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**

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<thead>
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<td>Prerequisites</td>
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</table>

**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 BIODIVERSITY AND CONSERVATION**

<table>
<thead>
<tr>
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<td>CA:</td>
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<td>Exam:</td>
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<td>Prerequisites</td>
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</tbody>
</table>

**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**

<table>
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<tr>
<th>Module Title</th>
<th>NATURAL RESOURCE ECONOMICS</th>
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<tr>
<td>Lecturers/week:</td>
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<td>Modules Assessment:</td>
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</tbody>
</table>

229

2020 FANR PROSPECTUS
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, 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.
**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

<table>
<thead>
<tr>
<th>FANR B.Sc. Degree Programme</th>
<th>New Diploma Agriculture (Neudamm and Oongo Campus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Code</td>
<td>Title</td>
</tr>
<tr>
<td>1st Year</td>
<td>1st Year</td>
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<td>1st Semester</td>
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<tr>
<td>UC E 3419</td>
<td>English Communication</td>
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<tr>
<td>Exemption through:</td>
<td>Exemption through:</td>
</tr>
<tr>
<td>UC SI 3529</td>
<td>Contemporary Social Issues</td>
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<tr>
<td>ULEA 3519</td>
<td>English for Academic Purposes</td>
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<tr>
<td>SBLG 3411</td>
<td>Introduction to Biology</td>
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<td>Exemption through:</td>
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<td>SPHY 3401</td>
<td>Physics for Life Sciences I</td>
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<td>SMAT 3511</td>
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<tr>
<td>SC HM 3532</td>
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<td>SPHY 3412</td>
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<td>SBLG 3512</td>
<td>Diversity of Life</td>
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B.Sc. Degree Structure for Diploma Students having completed the new curriculum and joining FANR Degree Programme as of 2012:
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<table>
<thead>
<tr>
<th>FANR B.Sc. (Agriculture) Degree Programme</th>
<th>New Diploma Agriculture (Neudamm and Oongo Campus)</th>
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**2nd Year**

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<th>2nd Semester</th>
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<tr>
<td>AGEC 3681</td>
<td>Principles of Microeconomics</td>
<td>AGEC 3681</td>
</tr>
<tr>
<td>AGEC 3691</td>
<td>Rural Sociology</td>
<td>AGEC 2422</td>
</tr>
<tr>
<td>AGEC 2521</td>
<td>Introduction to Rural Sociology</td>
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<td>AASC 3601</td>
<td>Genetics</td>
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<td>AFST 3601</td>
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<td>General Microbiology</td>
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2nd Semester

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<td>AGEC 3682</td>
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<td>AGEC 3692</td>
<td>Principles of Macroeconomics</td>
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<tr>
<td>Articulation</td>
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B.Sc. Degree Structure for Diploma Students having completed the new curriculum and joining FANR Degree Programme as of 2012:

<table>
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<td>AASC 3602</td>
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<td>Applied Animal Breeding</td>
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<td>Crop Production and</td>
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<td>Food Technology</td>
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2020 FANR PROSPECTUS
### ARTICULATION

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<th>New Diploma Management (Ogango Campus)</th>
<th>in Natural Resource Management as of 2012:</th>
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<tbody>
<tr>
<td><strong>FANR B.Sc. Degree Programme</strong></td>
<td><strong>B.Sc Degree Structure for Diploma Students</strong></td>
</tr>
<tr>
<td><strong>Course Code</strong></td>
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<tr>
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<td>ULEA 3419</td>
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<td>SBLG 3411</td>
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<td>through: SMAT 3511 Basic Mathematics</td>
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<tr>
<td>SCHM 3532</td>
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<tr>
<td>AC SC 2512</td>
<td>through: AC SC 2512 Soil Science and Water Manag. + Soil Conservation</td>
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<td>SPHY 3412</td>
<td>through: SPHY 3412 Physics for Life Sciences II</td>
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<td>SBLG 3512</td>
<td>through: SBLG 3512 Plant Entomology and Pathology</td>
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235 2020 FANR PROSPECTUS
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**2nd Year**

**1st Semester**

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<th>Course Code</th>
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<tbody>
<tr>
<td>AGEC 3681</td>
<td>Principles of Microeconomics</td>
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<tr>
<td>AGEC 3691</td>
<td>Rural Sociology</td>
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<td>AGEC 2422</td>
<td>Communication Information Systems</td>
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<td>AGEC 2521</td>
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**1st Semester**

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<td>Genetics</td>
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<tr>
<td>AIES</td>
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**2nd Semester**

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**2nd Semester**

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ARTICULATION

B.Sc Degree Structure for Diploma Students having completed the new curriculum and joining the FANR Degree Programme as of 2012:

<table>
<thead>
<tr>
<th>FANR B.Sc. Degree Programme (Natural Resources)</th>
<th>New Diploma in Natural Resource Management (Ogongo Campus)</th>
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<tr>
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<td>AIES 3602</td>
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<td>Soil Science</td>
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<td>ACSC 2601</td>
<td>Water Management &amp; Soil Conservation</td>
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<td>ANRE 3602</td>
<td>Climatology and Hydrology</td>
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<td>AIES 2602</td>
<td>Intro. to Natural Resource Economics</td>
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APPENDIX 2: MODULE EQUIVALENTS (Diploma and Degree programmes)

<table>
<thead>
<tr>
<th>MODULE EQUIVALENTS</th>
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<tbody>
<tr>
<td>OLD GRN CURRICULUM</td>
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<tr>
<td>1st YEAR</td>
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<tr>
<td>Module Code + Title</td>
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<tr>
<td>ACA 2100 Farm Duties</td>
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<tr>
<td>ACB 2111 Computer Skills</td>
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<td>ACB 2121 Mathematics</td>
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<td>ACB 2131 Biology</td>
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### Module Equivalents

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<tbody>
<tr>
<td>ACB 2161 Physics</td>
<td>AASC 2411 Physical Science</td>
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<tr>
<td>AEC 2112 Basic Concepts in Economics and and Management</td>
<td>AGEC 2402 Basic Economics</td>
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<tr>
<td>ASC 2112 Animal Nutrition</td>
<td>AASC 2412 Animal Nutrition and Feeding</td>
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<tr>
<td>ASC 2132 Introduction to Ecology</td>
<td>AIES 2442 General Ecology</td>
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<tr>
<td>CSC 2112 Principles of Crop Production</td>
<td>ACSC 2412 Principles of Crop Production</td>
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<tr>
<td>AEN 2111 Surveying</td>
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<tr>
<td>ASC 2111 Animal Anatomy + Physiology</td>
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<tr>
<td>ASC 2122 Animal Reproduction + Breeding</td>
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<table>
<thead>
<tr>
<th>OLD GRN CURRICULUM</th>
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<td>ACA 2200 Farm Duties</td>
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<td>ASC 2211 Range Management I</td>
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<tr>
<td>ASC 2221 Animal Health I</td>
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<tr>
<td>CSC 2211 Crop Protection</td>
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<td>NRO 2211 Introduction to Agroforestry</td>
<td>AIES 2531 Introduction to Agroforestry</td>
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<tr>
<td>AEN 2211 Farm Power + Machinery</td>
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<tr>
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<td>AEC 2222 Indigenous Resource Management and Rural Sociology</td>
<td>AGEC 2521 Introduction to Rural Sociology</td>
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<tr>
<td>ASC 2212 Range Management II</td>
<td>AASC 2511 Range Management</td>
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<td>ASC 2222 Animal Health II</td>
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## MODULE EQUIVALENTS

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<th>NEW UNAM CURRICULUM</th>
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<td>ACA 2300 Farm Duties</td>
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<tr>
<td>AEC 2311 Marketing Policy + Trade</td>
<td>AGEC 2621 Marketing, Trade + Policy</td>
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<tr>
<td>ASC 2311 Beef Production</td>
<td>AASC 2612 Extensive Animal Production</td>
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<td>ASC 2321 Pelt + Fibre Production</td>
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<td>AASC 2611 Intensive Animal Production</td>
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<td>CSC 2311 Field Crops Production</td>
<td>ACSC 2602 Crop Production</td>
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<td>ACSC 2612 Farm Technology II</td>
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<td>AEC 2341 Communications + Information Systems</td>
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<td>AEN 2321 Soil + Water Management</td>
<td>ACSC 2601 Water Management + Soil Conservation</td>
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<td>AEC 2312 Extension System Approaches</td>
<td>AGEC 2601 Extension Methods</td>
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<td>AEC 2332 Introduction to Entrepreneurship</td>
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