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UNIVERSITY OF NAMIBIA

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SCHOOL OF AGRICULTURE & FISHERIES SCIENCES

Prospectus 2022

FACULTY OF AGRICULTURE, ENGINEERING & NATURAL SCIENCES

UNIVERSITY OF NAMIBIA
SCHOOL PROSPECTUS 2022

SCHOOL

OF

AGRICULTURE

AND

FISHERIES SCIENCES

Edited & Published by the School of Agriculture and Fisheries Sciences,
University of Namibia, Windhoek

NOTE

This School Prospectus is valid for 2022 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 School 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 2022.

The fact that particulars of a specific programme, subject or module have been included in this School Prospectus does not necessarily mean that such a programme, subject or module will be offered in 2022 or any subsequent year.

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

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SCHOOL PREAMBLE

MISSION

The Mission of the School of Agriculture and Fisheries Sciences 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 School 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"

UNAM CORE DATES 2022	
DATE	**FIRST SEMESTER**
12 January	University Open
14 January	Start of Summer Term (Until 1 February)
24 January	Academic staff resumes office duties
14 February	Lectures commence for FIRST SEMESTER – Senior Students
28 February	Lectures commence for FIRST SEMESTER – First Year Students
11 April	First semester BREAK commences
19 April	Lectures commence after first semester break
20 May	Lectures end for FIRST SEMESTER - Senior Students
31 May	Regular Examinations commence – Senior Students
07 June	Lectures end for FIRST SEMESTER – First Year Students
13 June	Regular Examinations commence – First Year Students
21 June	Regular Examinations end – Senior Students
24 June	Regular Examinations end – First Year Students
30 June	End of FIRST SEMESTER
04 July	Start of Winter Term (until 08 July)
04 July – 08 July	Mid-year recess
11 – 15 July	Special/Supplementary/ Winter Term Examinations commence (Util 15 July)
DATE	**SECOND SEMESTER**
25 July	Lectures commence for SECOND SEMESTER
22 August	Second semester BREAK commences
29 August	Lectures resume after second semester break
21 October	Lectures end for SECOND SEMESTER
27 October	Regular Examinations commence
18 November	Regular Examinations end
28 November	Special/Supplementary Examinations commence (Until 2 December)
09 December	End of SECOND SEMESTER

16 December	End of academic year
09 January 2023	Start of Summer School (until 21 January)
12 January 2023	University opens (2023 academic year)
24 January 2023	Academic staff resumes office duties

DUE DATES FOR THE 2022 ACADEMIC YEAR

DATE	GENERAL DATES
21 January	Last day for appeals (Semester 2 & Double modules – Regular and Supplementary/Special examinations of November 2021)
14 January	Last day for application of retention of continuous assessment (CA) mark and Last day for application for exemption(s) (Senior Students)
17 January	Last day for recommendation of retention of continuous assessment mark and Promotion Examinations by Faculties
24 January	Last day for approval of retention of continuous assessment mark and Promotion Examination by Examinations Department
07 February	Promotion Examination
11 February	Last day for application for exemption(s) - senior students
12 February	Last day for Late Registration for all Senior students (*Late fee payable*)
12 February	Last day for approval of module(s) & qualification changes (Senior Students)
04 March	Last day for application for exemption(s) – 1st year students
11 March	Last day for approval of exemption(s) changes – all students
29 April	Last day to submit Theses and Dissertations for examinations (for Spring Graduation 2022)
02 August	Last day for Appeals (Semester 1 Modules - Regular and Supplementary/Special examinations of June 2022)
31 Augustus	Last day to submit outstanding documentation
07 October	Last day to cancel enrolment
28 October	Last day to submit Theses and Dissertations for examinations (For Autumn Graduation 2023)
DATE	CANCELLATION DUE DATES
13 May	Last day to cancel Semester 1 modules
07 October	Last day to cancel Semester 2 modules
07 October	Last day to cancel Double modules (module that extends normally over one academic year
DATE	FINANCE DUE DATES
18 March	Last day to cancel Semester 1 and Double modules with 100% credit
30 April	Last day to cancel Semester 1 modules with 50% credit
24 June	Last day to cancel Double modules with 50% credit
12 August	Last day to cancel Semester 2 modules with 100% credit
31 August	Last day to cancel Semester 2 modules with 50% credit

STRUCTURE AND PERSONNEL OF THE SCHOOL

ACADEMIC STAFF BY CAMPUSES AND DEAN OFFICE

EXECUTIVE DEAN: FACULTY OF AGRICULTURE, ENGINEERING & NATURAL RESOURCES

Prof. NM. Nickanor: BSc (UNAM), PGD, M.A (Univ of Botswana), (PhD (UCT)

☎ (+264 61) 206 3890 or (+264 61) 206 3791 nnickanor@unam.na ✉ Private Bag 13301, Windhoek, Namibia

FACULTY MANAGER: FACULTY OF AGRICULTURE, ENGINEERING & NATURAL RESOURCES

☎ (+264 61) 206 3890 or (+264 61) 206 3791 @unam.na ✉ Private Bag 13301, Windhoek, Namibia

FACULTY COORDINATOR POSTGRADUATE STUDIES: FACULTY OF AGRICULTURE, ENGINEERING & NATURAL RESOURCES
Ms. RM Shilongo: MPhil in Development Finance(University of Stellenbosch) MSc in Accounting & Finance (University of Namibia) Bachelor of Accounting (University of Namibia)

☎ (+264 61) 206 4111 or (+264 61) 206 3791 rmshilongo@unam.na ✉ Private Bag 13301, Windhoek, Namibia

ASSOCIATE DEAN: SCHOOL OF AGRICULTURE & FISHERIES SCIENCES

Dr S T Angombe: BSc (Unam), PDipNaReM (Autralian) National University, Canberra – Australia), MSc (Autralian National University, Canberra -Russia)

☎ (+264 61) 206 3023/3180 or (+264 61) 206 3100 sangombe@unam.na ✉ Private Bag 13301, Windhoek, Namibia

HEAD OF DEPARTMENT: ANIMAL PRODUCTION, AGRIBUSINESS & ECONOMICS (NEUDAMM CAMPUS)

Dr T O Amushendje: B.Sc. (Hons), Molecular Biology (Murdoch University, Western Australia);

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

HEAD OF DEPARTMENT: FISHERIES AND OCEAN SCIENCES (SAM NUJOMA CAMPUS)

Dr J A Iitembu: B.Sc. (UNAM), M.Sc. (Univ. of Tromso), PhD (Rhodes)

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

HEAD OF DEPARTMENT: FOOD SCIENCE AND SYSTEMS (NEUDAMM CAMPUS)

Mr S Emvula: B Sc Agric Food Science & Technology (Unam); M Sc Food Science (Stellenbosch); Postgraduate Diploma in Higher Education (UNAM)

☎ (+264 61) 206 4003 (+264 61) 206 3013 semvula@unam.na ✉ Private Bag 13188, Windhoek, Namibia

Matters regarding specific subjects and departments should be addressed to the relevant Head of Department.

ADMINISTRATIVE STAFF: (NEUDAMM CAMPUS)

(+264 61) 2064111 **lamadhila**@unam.na P.O. Box 13188, Windhoek, Namibia

Faculty Officer:	Ms Belinda Bock: Bachelor in Business Administration (Hons) (UNAM), Dipl.in Information Administration (NUST)
Examinations Officer:	Ms Josefina Muhama: Bachelor in Agricultural Science (Namibia University of Science and Technology).
Faculty Librarian:	Ms M T Tjituka: B.A. (Hons) Public Admin (Polytechnic of Wales); Postgraduate Dipl in Library & Info Studies (University College London); M A. Library & Info Studies (University of London); Cert. Advanced Studies in Library & Info. Sci (Long Island Univ, New York)
Subject Librarian:	Ms N S T Uugwanga: Diploma Information Studies (UNAM); B A Library Science & Records Management & History (UNAM); Postgraduate Diploma in Library & Information Studies (UCT); Master in Library and Information Studies (UCT)
Senior Library Assistant:	Mr T Ntesa: Dipl Information Studies (UNAM); B Arts: Information Science (UNISA)
Library Assistant:	Ms E Nguvauva: Dipl Records Management (Southern Business School); B Arts: Information Science (UNISA)
Library Assistant:	Mrs M Kaahangoro: Dipl Records Management (Southern Business School); B Arts: Information Science (UNISA)
Administrative Assistant:	Ms Lydia Amadhila:

CAMPUS AND FARM STAFF: (NEUDAMM CAMPUS)

(+264 61) 206 4111 reception or **(+264 61) 206 4063** **smudabeti@unam.na** **Private Bag 13188, Windhoek, Namibia**

Campus Administrator:	Mrs. S. Juliet Mudabeti: BPsych. Hons (UNAM), M. Leadership and Change Management(NUST),Public Management Certificate(UNISA)
Student Support Officer:	Mr. A. Kandjimi: BA (UNAM), Dip. Local Government Studies(UNAM), Certificate in Procurement(AMAD University)
Farm Manager:	Mr E Beukes: National Dipl. Agric (Tsumis)
IT Support Technician:	Mrs. Loini Asino Postgraduate Diploma IT(Amity university); Comptia N+ (Nust CED); B-Tech Systems Administration and Networking (Polytechnic of Namibia); National Diploma IT(Polytechnic of Namibia)
Administrative Assistant:	Vacant
Student Finance Officer:	Ms M Mubukwanu: Degree Finance Manager (Hons) (IUM)
Estates Officer:	Mr D Tiboth: National Dipl. Public Administration (Polytechnic of Namibia).
Supervisor Workshop:	Vacant
Supervisor:	Mr P Beukes: National Dip. Agric (Tsumis)
Supervisor:	Mr B M Matomola: Bachelor Degree in Agricultural Management; National Dip. Agric (Neudamm)
Supervisor:	Mr J Ngavetene: National Dip. Agric (Neudamm); B.Ed (UNAM); B.Agric Hons (Polytechnic of Namibia)
Supervisor	Mr G Sheehama: National Dip. Agric(Ongongo), Higher Diploma in Education (North West University), B. Hons Agric Extension (University of Pretoria)
Supervisor Intensive Section:	Vacant
Assistant Supervisor:	Mr G /Gomxob: Trade Dip. Diesel Mechanic
Assistant Supervisor:	Mr. A. Tjiriange: Dip. Agric (Dooringboom)
Assistant Supervisor:	Mr R Fredericks
Assistant Supervisor:	Mr R Kandjou
Assistant Supervisor:	Mr I Lisias

OGONGO CAMPUS

(+264 65) 223 5000 reception or **(+264 65) 223 5323 Assistant Faculty Officer (onhaludilu@unam.na) Private Bag 5520, Oshakati, Namibia**

Campus Director	Dr C. Mberema: B.Sc. Agric (UNAM); M.Sc. Animal Science, (University of Arizona USA); PhD, Molecular Genetics and Meat science (Newcastle University, UK)
Head of Academic Affairs:	Dr.B. Thomas Bsc agric (UNAM); Msc Agri Econ (Stellenbosch); PhD Agric Econ (Stellenbosch)
Campus Administrator:	Mr. M. Nghihangwa: B-Tech (Unisa) Master in Public Admin (Univ Western Cape)
Farm Manager:	Mr. S. Martin: National Dipl Agric (Neudamm); B Sc Agric (Univ Free State, Bloemfontein)
Assistant Faculty Officer:	Mr. O Haludilu: Bachelor in Business Administration (Hons) (UNAM),
Student Support Officer:	Mr Willem Amutenya: B.Ed (Science), (Unam), M.Ed Leadership and Management Policy (IUM)
IT Support Technician	Mr .M. Nyambe: ICDL, CompTIA+, N+, Security+, Project+, Microsoft Certified Systems Administrator(MCSA), MCITP, Diploma in Computer Science(UNAM), Bachelor of Business Administration(UNAM),PG Dip MIS(UCT), MBA(Regent Business School)
Examinations Officer:	Ms J Amupolo: B. Econ (Unam); B.Econ (Hons) Univ Western Cape
Librarian:	Mrs. C. N. Nakanduungile: Dipl Information Studies (UNAM), BA Library Science and Record Management (UNAM), PGDip Library and Information Studies (UCT), and Master in Library and Information Studies (UCT)
Senior Library Assistant:	Mr J Kambuta
Library Assistant:	Ms T N Andowa
Library Assistant:	Ms S Shiimbi: Dipl Information Studies
Library Assistant:	Ms Christaline Handura: Dipl in Library Science
Secretary to the Campus Director	Ms H.T. Utoni: International Computer Driving Licence ICDL, (UNAM) Certificate in HIV/AIDS counselling (UNAM), Diploma in Public Relations (UNAM)Certificate in IT (SchoolNet Namibia), Certificate in Marketing (SME Compete)
Campus Security Officer	Ms J. Saul: Certificate: Crime Prevention and Security Design (ARC International ltd), Diploma: Police Management (Namibia Business School)
Supervisor: Cereal Production	Mr. T. Lwiinga: Certificate in Rice Cultivation Theory (Nagoya University Fodder Japan) Diploma in Agronomy (Idilio Rodriquez –Technical Institute, Cuba)
Supervisor: Dairy and Food Processing	Mr. A. Malyenge: Dipl Agric (Ogongo); Dipl in total quality Management production (UNISA); BSc (Hons) Food Science and Technology (Putra University, Malaysia
Supervisor: (Horticulture)	Mr. M. Shishwandu; Dipl Agric (Ogongo); Bachelor of Agric Management (Polytechnic of Namibia)
ActingSupervisor: Nursery & Orchards	Ms. T. Muhama: Certificate in HIV Counselling (UNAM); Diploma in (Natural Resource) Agronomy (Sovhoz-technicum.V.I Lenin, USSR).
Supervisor: Livestock and Game	Mr. D. Shikola: Dipl Agric (Ogongo); Bachelor of Agric Management (Livestock) (Polytechnic of Namibia)
Supervisor: Workshop	Mr. J. Kangulu: Certificate in Automobile (German Technical Institute; Sri Lanka); Certificate in measuring and testing (Mbabane University; Swaziland)

ACADEMIC STAFF BY DEPARTMENTS AND SCHOOL

DEPARTMENT OF ANIMAL PRODUCTION, AGRIBUSINESS & ECONOMICS (NEUDAMM CAMPUS)

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

Head of Department:	Dr T. O. Amushendje
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:	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)
Associate Professor:	Vacant
Senior Lecturer	Dr T O Amushendje: B.Sc. (Hons), Molecular Biology (Murdoch University, Western Australia); PhD, Molecular Genetics and Wool Science (Lincoln University, New Zealand).
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 N P Petrus: B.Agric. (Animal Science) University of Nigeria Nsukka, Nigeria; M.Sc. (CIRAD- Montpellie (France), Animal production in the tropics; PhD Poultry (Nutrition and Genetic characterization) (UNAM).
Senior Lecturer:	Dr S P Muteka: B.Sc. (Concordia), M.Sc. (Pretoria), PhD Zoology (Reproductive Biology) [University of Pretoria, RSA]
Senior Lecturer:	Dr C N Jona: B.Sc. Agric (UNAM); B.Sc. (Hons) (Pretoria); M.Sc. Agric Extension (Pretoria); PhD Agric Extension (Pretoria)
Lecturer:	Dr M. N. T. Shipandeni: National Dip Agric (Ogongo), B.Sc. Agric (UNAM); MSc. Animal Nutrition (University of Wageningen, Netherlands), PhD (Stellenbosch University, SA)
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:	Dr. V Charamba: BSc Hon. Statistics (UZ); MSc Statistics (UZ)
Lecturer:	Mr S K Kalundu: Nat Dip Agric (Neudamm); B.Sc. Agric (UNAM); M.Sc. Agric Econ (Arkansas, USA)
Lecturer:	Vacant
Lecturer:	Mr M N Angula: Nat Dip Agric (Ogongo); B.Sc. Agric (UNAM); M.Sc. (Michigan, USA)
Lecturer:	Mr M M Eiseb: Dip Agric (Polytechnic); B.Sc, M.Sc. Agric Econ (Fort Hare)
Lecturer:	Mr J N Muzanima: B Sc Agric Economics (UNAM); M Sc Agric Economics (IARI, India)
Lecturer:	Mr T Maharero: B.Sc. Agric (Natal), MBA (MANCOSA), South Africa
Lecturer:	Ms L Halueendo: B.Sc.Zoology, Botany & Psychology (UNAM); B.Sc Hons Crop Protection (Pretoria); M.Sc. Crop Protection (Prectoria); Professional Diploma in Eduation (UNAM)
Senior Technologist:	Dr. S Shihepo: BSc Agric. (UNAM); M.Sc. Agric. (Animal Nutrition) (UNAM); PhD Agric. (Animal Nutrition) (UNAM)
Technologist:	Ms. A. Nambahu: National Diploma Agric; B.Sc Agric. (Hons) (UNAM)

DEPARTMENT OF ANIMAL PRODUCTION, AGRIBUSINESS & ECONOMICS (OGONGO CAMPUS)

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Head of Department:	Dr T. O. Amushendje
Associate Professor:	Vacant
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Senior Lecturer	Dr B Thomas: B Sc Agric (UNAM); M Sc Agric Econ (Stellenbosch) PhD Agric Econ (Stellenbosch)
Senior Lecturer:	Mr C Togarepi: Bsc Agric (UNAM); PGDE (UNAM), M.Sc Agric Econ (UNAM)
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:	Dr B Gorejena: BVSc (University of Zimbabwe); MBA (Assam Don Bosco University)
Lecturer:	Mr O Mbango: B.Sc. Agric (UNAM); M.Sc. Rangeland Resource Management (UNAM).
Lecturer:	Mr. L. Kaholongo: National Diploma Agric. (Ogongo); B.Sc. Agric. ((Unam); M.Sc. Animal Science. (Unam)
Lecturer:	Vacant
Lecturer:	Ms M M Hangula: Nat Dip Agric (Ogongo); B.Sc. Agric (UNAM); M. Sc. Agric & Resource Econ (Alberta, Canada)
Lecturer:	Mrs. S. Shivolo-Useb: Nat Dip Agric (Neudamm); B. Econ (UNAM); MBA-Finance (UNAM)
Lecturer:	Ms E R Sheehama: B.Sc. Agric (UNAM); B.Sc. (Hons) Free State Univ.

DEPARTMENT OF CROP PRODUCTION AND AGRICULTURAL TECHNOLOGIES (OGONGO CAMPUS)

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Head: Academic Affairs	Dr .B. Thomas Bsc agric (UNAM); Msc Agri Econ (Stellenbosch); PhD Agric Econ (Stellenbosch)
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
Associate Professor	Prof. R J Birech: Dip Agric, BSc (Egerton Univ., Kenya); MPhil Moi Univ., Kenya); PhD (Vienna, Austria)
Lecturer	Dr S K Awala: National Dip Agric (Neudamm); B.Sc. Agric (UNAM), M. Agric. Sc. (Nagoya Univ., Japan); PhD Agric. Sc. (Kindai Univ., Japan).
Lecturer	Dr P I Nanhapo: B.Sc. Agric (UNAM); M. Agric. Sc. (Nagoya Univ., Japan); PhD (Kindai Univ., Japan)
Lecturer	Mr K Hove: B Sc Mathematics (Hons) (MSU); M. Sc Operations Research (NUSTZim); PGDE (NUST-Zim)
Lecturer	Mr. K Elungi: B.Sc. Agric (UNAM); M.Sc. Plant Pathology (UKZN); MBA (NUST Harold Graduate School of Business)
Lecturer	Mr F Shinombedi: M.Sc. Agric Eng (Czechelsovakia)
Lecturer	Mr G Hatutale: B.Sc. Agric (UNAM), M.Sc. Horticulture (Free State Univ)
Lecturer	Mr J Chigariro: Dipl Agric (Gwebi, Zim); PGDipl Grain Storage Management (UK); M Sc Grain Storage Management (Greenwich University, UK)
Lecturer	Mr L Nuugulu: B.Sc Agric Crop (UNAM); B Sc (Hons) Agronomy (Univ of Free State);Msc Horticulture (University of Free State) Study Leave (Botswana)

Lecturer	Dr B Mudamburi: Dip Agric (Chibero, Zim); B.Sc. Hons (Cranfield, UK); MSc. (Wageningen University- The Netherlands); PhD Agric Engineering (UNAM)
Lecturer	Mr P A Ausiku: National Dip Agric (Ogongo); B.Sc. Agric (UNAM); M Sc Agric (Kinki Univ,, Japan), Study Leave (Univ. of Pretoria).
Lecturer	Ms C K Kamburona-Ngavtene: B.Sc. Agric (UNAM); MSc. Genetics (Pretoria)
Assistant Lecturer	Ms H Kandongo: B.Sc. Agric Mechanisation (Karl Marx University)
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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, MSc Agric (UNAM)

DEPARTMENT FISHERIES AND OCEAN SCIENCES (SAM NUJOMA CAMPUS)

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Campus Director:	Dr S K Mafwila: B.Sc. (UNAM); PGDE (UNAM); B.Sc.Hons (Rhodes); M.Sc. (UCT) PhD (UCT)
Head: Academic Affairs	Dr J A Iitembu: B.Sc. (UNAM), M.Sc. (Univ. of Tromso), PhD (Rhodes)
Office Administrator:	Ms E Uahindua: Secretarial Certificate (CCOSA - Zimbabwe)
Assistant Librarian:	Ms L Iipinge: B.A. Library Science and Resource Management (UNAM)
Library Assistant:	Mr E Thaniseb: Dipl Library and Information Studies (Univ of Botswana)
Estates Officer:	Mr M Dominicus: Dipl (WVTC)
Security Officer	Mr TS Shaanika
Students Support Officer:	Mr Bernardo Evaristus (Office of the Dean of Students)
Student Records Officer	Mr M Kangootui: Adult Basic Education & Training Certificate (ABET),
And Examination Officer:	UNISA; Dipl Public Management (Polytechnic of Namibia)
IT Officer:	Mr Fillemon Nime

DEPARTMENT OF FOOD SCIENCE AND SYSTEMS (NEUDAMM CAMPUS)

☎ (+264 61) 206 4003 (+264 61) 206 3013 semvula@unam.na ✉ Private Bag 13301, Windhoek, Namibia

Head of Department:	Mr. S Emvula Applied Immunology (Brunel Univ); PhD Microbiology (Univ. Pretoria)
Associate Proffesor:	Prof K K M Nantanga: B Sc (UNAM); B Sc Hons (Rhodes Univ); M Sc (Univ. Pretoria); PhD (Univ Guelph, Canada)
Senior Lecturer:	Dr M NNN Shikongo-Nambabi: B Sc Hons Biochemistry (Kent Univ); M Sc
Senior Lecturer:	Dr P Hiwilepo-van Hal: B Sc Agric, Food Science & Technology (UNAM); M Sc, PhD Food Science (Wageningen)
Lecturer:	Mr C Samundengu: B Eng.(UNZA); B Eng. Hons, M Eng.(Univ Pretoria); Posgraduate Dipl Bus Admin (UNAM); M Sc Acc & Finance (UNAM)
Lecturer:	Dr S C Barrion: B Sc Agric, Food Science & Technology (UNAM); B Sc Hons Food Science (Univ Pretoria); M Sc (Distinction) Food Science & Technology (Univ Pretoria); PhD in Nutritional Sciences (University of Surrey)
Lecturer:	Ms M J Kandjou: B Sc Agric, Food Science & Technology (UNAM); M Sc Dairy Science & Technology (Univ Zimbabwe)
Lecturer:	Mr S Emvula: B Sc Agric Food Science & Technology (Unam); M Sc Food Science (Stellenbosch); Postgraduate Diploma in Higher Education (UNAM)
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)

General enquiries regarding the programmes offered by the School of Agriculture and Fisheries Sciences should be directed to:
The Faculty Officer
School of Agriculture and Fisheries Sciences
University of Namibia
Private Bag 13301
WINDHOEK
Namibia
Tel: (061) 206 3890
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E-mail: bbock@unam.na
Website: www.unam.na → (School of Agriculture & Fisheries Sciences)

OR
The Assistant Faculty Officer
School of Agriculture and Fisheries Sciences
University of Namibia
Private Bag 5520
OSHAKATI
Namibia
Tel: (065) 223 5000
Fax: (061) 223 5294
E-mail: onhaludilu@unam.na
Website: www.unam.na → (School of Agriculture & Fisheries Sciences)
Enquiries regarding specific subjects and departments must be addressed to the relevant Head of Department

A. REGULATIONS

The regulations of the School of Agriculture and Fisheries Sciences 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 School may offer the following diploma and degree programmes:

A.1.1 UNDERGRADUATE PROGRAMMES

Diplomas

(Code)	Minimum Duration	
(17HDAG)	Diploma in Agriculture	3 years full-time

Degrees

(Code)	Minimum Duration	
(17BSAE)	Bachelor of Science in Agriculture (Agricultural Economics) Hons	4 years full-time
(17BSAS)	Bachelor of Science in Agriculture (Animal Science) Hons	4 years full-time
(17BSCS)	Bachelor of Science in Agriculture (Crop Science) Hons	4 years full-time
(17BSFS)	Bachelor of Science in Agriculture (Food Science) Hons	4 years full-time
(17BSFA)	Bachelor of Science in Fisheries & Aquatic Sciences (Hons)	4 years full-time

A.1.2 POSTGRADUATE PROGRAMMES

Degree (Code)		Minimum Duration
(17MSRR)	Master of Science in Rangeland Resources Management	2 years full-time
(17MSAG)	Master of Science in Agriculture (By Thesis)	2 years full-time
(17MSFA)	Master of Science in Fisheries and Aquatic Science (By Thesis)	2 years full-time
(17DPAG)	Doctor of Philosophy in Agriculture	3 years full-time
(17DPFA)	Doctor of Philosophy in Fisheries and Aquatic Science	3 years full-time

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

A.4 CONDUCT OF THE PROGRAMMES

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

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

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

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

- Diploma in Agriculture (Ogongo Campus);

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);

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);
- Master of Science in Fisheries and Aquatic Science (By Thesis)
- Doctor of Philosophy in Agriculture
- Doctor of Philosophy in Fisheries and Aquatic Science
- Doctor of Philisophy in Agriculture

A.5 DURATION OF STUDY (UNDERGRADUATE PROGRAMMES)

A.5.1 Subject to the provisions of School 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),

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 the lectures and practicals

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

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

To be re-admitted into the School, a student must have passed the minimum number of credits as indicated below
By programmes:

A.9.1 DIPLOMA IN AGRICULTURE

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

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

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

To be re-admitted into **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.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 83 credits of second year (67% of the total 124 credits in second year) to be able to register for Third Year.

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

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

A.10.2 BACHELOR OF SCIENCE IN AGRICULTURE (AGRICULTURAL ECONOMICS) HONOURS

A.10.4.1 **First Year to Second Year**

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

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

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

A.10.4.2 **Second Year to Third Year**

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

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

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

A.10.4.3 **Third Year to Forth Year**

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

A.10.3.3 **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.10.3 BACHELOR OF SCIENCE IN AGRICULTURE (ANIMAL SCIENCE) HONOURS

A.10.4.1 First Year to Second Year

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

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

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

A.10.4.2 **Second Year to Third Year**

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

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

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

A.10.4.3 **Third Year to Forth Year**

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

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

A.10.5.1 First Year to Second Year

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

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

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

A.10.5.2 Second Year to Third Year

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

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

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

A.10.5.3 Third Year to Fourth Year

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

A.10.5 BACHELOR OF SCIENCE IN AGRICULTURE (FOOD SCIENCE & TECHNOLOGY) HONOURS

A.10.6.1 **First Year to Second Year**

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

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

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

A.10.6.2 **Second Year to Third Year**

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

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

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

A.10.6.3 **Third Year to Fourth Year**

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

A.10.6 BACHELOR OF SCIENCE IN FISHERIES & AQUATIC SCIENCES (HONOURS)

A.10.7.1 **First Year to Second Year**

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

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

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

A.10.7.2 **Second Year to Third Year**

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

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

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

A.10.7.3 **Third Year to Fourth Year**

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

A.11 AWARDING OF DIPLOMAS AND DEGREES

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

(i) Pass all modules taken in the programme;

(ii) Have completed and passed all field practical training courses.

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

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

B.1 PROGRAMME SCHEDULE

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

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

Year 3 Semester 1					
AACA 2600	**Special Study**	**6**	**8**	**C**	**ACSC2582 (Introduction to Research**

AACA 2601	**Field Attachment**	**6**	8	**C**	**None**
AAEC 2641	**Principles of Agricultural Extension**	**6**	8	**C**	**None**
AAEC 2661	**Agricultural Marketing and Policy**	**6**	8	**C**	**None**
AASC 2681	**Intensive Animal Production**	**6**	12	**C**	**None**
ACSC 2601	**Water Management and Soil Conservation**	**6**	8	**C**	**ACSC 2581 (Soil Science)**
AASC 2691	**Range Management**	**6**	**12**	**C**	**None**
Total Credits Semester 1			**68**		
Year 3 Semester 2					
AACA 2600	**Special Study**	**6**	**8**	**C**	**ACSC2582 (Introduction to Research)**
AAEC 2602	**Project Management**	**6**	**8**	**C**	**None**
AAEC 2622	**Entrepreneurship**	**6**	**8**	**C**	**None**
AASC 2622	**Animal nutrition and Feeding**	**6**	**8**	**C**	**None**
AASC 2602	**Game Farming**	**6**	**8**	**C**	**None**
AASC 2642	**Extensive Animal Production**	**6**	**8**	**C**	**None**
ACSC 2682	**Farm Power and Machinery**	**6**	**12**	**C**	**AAEC 2411 (Basic Mathematics & Statistics)**
ACSC 2622	**Crop Protection**	**6**	**8**	**C**	**None**
Total Credits Semester 2			**68**		
TOTAL CREDITS YEAR 3			**132**		
TOTAL PROGRAMME CREDITS			**388**		

B.2 MODULE DESCRIPTORS

B.2.1 FIRST YEAR MODULES

ULEG 2410: ENGLISH FOR GENERAL COMMUNICATION

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

CLC3509: COMPUTER LITERACY

Module title: **COMPUTER LITERACY**
Code: CLC3509
NQF level: 5
Contact hours: 1 lecture theory and 1 lecture practical per week for 14 weeks
Credits: 8
Module assessment: Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%
Prerequisites: University Entry
Module Content:
The aim of this module is to equip the students through hands-on experience with the necessary skills to use application software: word processing, spreadsheets, databases, presentations and communications. The objective is to increase student's productivity

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

CSI3580: CONTEMPORARY SOCIAL ISSUES

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

Module Content:

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

AAEC 2411: MATHEMATICS AND BASIC STATISTICS

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

Module Content:

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

AASC 2431: BIOLOGY

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

Compulsory/Elective Compulsory
Semester Offered 1
Module Content:
Chemical basis of life; Introductory structure of macromolecules and their functions Prokaryotic and eukaryotic cells; Overview of the five major kingdoms of organisms and Viruses; Basic plant and animal anatomy and physiology: Differences between plant and animal cells; Photosynthesis; Osmosis & diffusion, cell respiration, passive and active transport; Basic taxonomy, Basic concepts of Mendelian genetics: Cell cycle; Mitosis and Meiosis; Sexual and asexual reproduction; Introduction to ecology, ecosystems and communities; Naming of ecosystems and communities; Food chain and food web; Interrelationships among organisms.

AACA 2400: FARM DUTIES I

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

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

AAEC2482: BASIC ECONOMICS

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

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

AASC 2432: PHYSICAL SCIENCE

Module Title:	**PHYSICAL SCIENCE**
Code	AASC 2432
NQF Level	4
NQF Credits Assessment `	16
Strategies Contact hours	Continuous assessment 60% (minimum 2 tests and Examination 40% (1 x 3 hour paper)
Prerequisite	4 hours per week lectures; 3 hours practical for 14 weeks

Compulsory/Elective None
Semester Offered Compulsory
Module Content:
Laboratory safety. Physical quantities and measurements –SI. Properties of matter; Atoms, elements, molecules & compounds; The Periodic Table; Chemical formulae; Covalent and ionic compounds; non-polar and polar molecules; Molecular and formula mass; Redox reactions; Moles and Molarity; Octet rule; Electronic bonding & orbitals; Lewis structures; Chemical reactions and equations; Balancing chemical equations; Stoichiometry; Acids and bases; pH & buffers; Solutions and Solubility; Structure and properties of water; Ionisation of water; Laws of motion, force, energy, work. Kinetic theory of gases; Gas laws, pressure; Basic electricity; Voltage, current, power, conductors, insulators. Thermodynamics and heat; conduction, radiation and convection.

AASC 2422: ANIMAL ANATOMY, PHYSIOLOGY AND REPRODUCTION

Module Title: **ANIMAL ANATOMY, PHYSIOLOGY AND REPRODUCTION**
Code AASC 2422
NQF Level 4
NQF Credits 8
Assessment Strategies Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)
Contact hours 2 hours lectures per week; 3 hours practical alternate week for 14 weeks
Co-requisite None
Compulsory/Elective Compulsory
Semester Offered 2
Module Aims:
Module Content:
This module covers the following aspects: morphology and Function of the reproductive system, circulatory, respiratory, nervous, skeletal, and urinary and digestive systems of farm animals (ruminants, mono-gastric animals, and poultry), their anatomical and functional interrelationships. Practical classes which will involve the use of carcass dissections, examination of internal organs in dead animals, and the study of laboratory models, will help in the understanding of the anatomical structures and the interrelationship between organic systems. Artificial insemination will also be coved in this Module.

B.2.2 SECOND YEAR MODULES

AACA 2500: FARM DUTIES II

Module Title: **FARM DUTIES II**
Code AACA 2500
NQF Level 5
NQF Credits 16
Assessment Strategies Pass or fail grade. Pass with more than 80 % attendance
Contact hours one full day (7 hour day) alternating for 28 weeks
Prerequisite None
Compulsory/Elective Compulsory
Semester Offered 1 and 2
Module Content:
During the second year, all Diploma students will undertake one full day (7 teaching hours) of farm duties every second week, for a total of 14 days during the year. These duties will be undertaken on campus farm Ogongo, involving all activities undertaken at the two farms. The farm duties will be geared toward developing students' specific farming skills as tractor driving and implement operation, vehicle driving, artificial insemination and pregnancy diagnosis, pump and borehole maintenance, vegetable propagation methods, keeping computerization and analysis of farm and financial records, animal judging, fertilization and pesticide application, erosion and draft animal utilization. Forty-nine teaching hours per semester will be awarded for this work. Assessment will be based on attendance at duty stations, participating in and completion of tasks and attitudes towards work, as well as grading during specific courses that take place in the recess periods (e.g. Easter and, winter and Spring).

AAEC 2541: COMMUNICATION AND INFORMATION SYSTEMS

Module Title: **COMMUNICATION AND INFORMATION SYSTEMS**
Code AAEC 2541
NQF Level 5
NQF Credits 8
Assessment Strategies Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination 40% (1 x 2 hour paper)

Contact hours	2 lecture hour per week and practical 2 hours alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

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

AAEC 2501: FINANCIAL MANAGEMENT

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

Module Content:

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

AAEC 2521: INTRODUCTION TO RURAL SOCIOLOGY

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

Module Content:

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

ACSC 2581: SOIL SCIENCE

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

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

AASC 2551: APPLIED ANIMAL HEALTH

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

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

ACSC 2582: INTRODUCTION TO RESEARCH

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

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

ACSC 2522: WORKSHOP TECHNOLOGY, SURVEYING AND FARM STRUCTURES

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

Prerequisite	AAEC 2411 Mathematics and Basic Statistics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

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

ACSC 2532: VEGETABLE AND FRUIT PRODUCTION

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

Module Content:

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

ACSC 2592: CROP PRODUCTION

Module Title:	**CROP PRODUCTION**
Code	ACSC 2592
NQF Level	5
NQF Credits	12
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment) Examination 40% (1 x 2 hour paper)
Contact hours	3 hours lecture per week, 3 hours practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

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

AASC 2502: APPLIED ANIMAL BREEDING

Module Title:	**APPLIED ANIMAL BREEDING**
Code	AASC 2502
NQF Level	5
NQF Credits	8
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination

	40% (1 x 2 hour paper)
Contact hours	2 lecture per week; 3 hours practicals alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

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

B.2.3 THIRD YEAR MODULES

AACA 2600: SPECIAL STUDY

Module Title:	**SPECIAL STUDY**
Code	AACA 2600
NQF Level	6
NQF Credits	16
Contact hours	32
Prerequisite	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
Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

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

AAEC 2641: PRINCIPLES OF AGRICULTURAL EXTENSION

Module Title:	**PRINCIPLES OF AGRICULTURAL EXTENSION**
Code	AAEC 2641
NQF Level	6
NQF Credits	8
Assessment Strategies	Continuous assessment 60% (minimum 2 tests and 1 assignment); Examination

	40% (1 x 2 hour paper)
Contact hours	2 hours lectures and 2 hr practical alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

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

AAEC 2661: AGRICULTURAL MARKETING AND POLICY

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

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

Assessment Strategies

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

AASC 2691: RANGE MANAGEMENT

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

Module content:

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

AAEC 2602: PROJECT MANAGEMENT

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

Module content:

Project as a means of developing rural areas. The project cycle; project identification, situation analysis: problem tree analysis. Project review (technical, institutional and managerial); Project environment: social, political, financial economic, commercial, legal and gender. Project design techniques (logical framework); Project implementation, management structure and resources;

Project monitoring; project evaluation, type of evaluation. Examples of projects, Namibian projects, level of planning. Projects in the context of the regional and national development plan.

AASC 2622: ANIMAL NUTRITION AND FEEDING

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

Module content:

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

AAEC 2622: ENTREPRENEURSHIP

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

Module content:

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

AASC 2602: GAME FARMING

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

Module content:

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

AASC 2642: EXTENSIVE ANIMAL PRODUCTION

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

Module content:

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

ACSC 2682: FARM POWER AND MACHINERY

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

Module content:

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

ACSC 2622: CROP PROTECTION

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

Module content:

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

D. 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 School 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.

D.1 PROGRAMME SCHEDULE

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 1 Semester 1					
UCLC 3509	**Computer Literacy**	**5**	**8**	**C**	
ULCE 3419	**English Communication and Study Skills**	4	16	C	
UCSI 3580	**Contemporary Social Issues**	5	8	C	
SBLG 3511	**Introduction to Biology**	5	16	C	
CEMI 3571	**Basic Microeconomics**	5	16	C	
SMAT 3511	**Basic Mathematics**	5	16	C	
Total Credits Semester 1					**80**
Year 1 Semester 2					
CEMA 3572	**Basic Macroeconomic**	**5**	**16**	**C**	
SBLG 3512	**Diversity of Life**	**5**	**16**	**C**	
SMAT 3512	**Diversity of Life**	**5**	**16**	**C**	
SSTS 3522	**Introduction to Statistics**	**5**	**8**	**C**	
ULEA 3519	**English for Academic Purposes**	**5**	**16**	**C**	
Total credits Semester 2					**72**
Total CREDITS YEAR 1					**152**

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
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**
Year 2 Semester 2					
AAEC 3682	**Production Economics**	**6**	**12**	**C**	CEMI3571(Basic Microeconomics)
AAEI 3682	**Intermediate Macroeconomics**	**6**	**12**	**C**	CEMA3572(Basic Macroeconomics)
AAEC 3612	**Mathematical Economics & Linear**	**6**	**16**	**C**	SMAT 3511 (Basic Mathematics)

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

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 3 Semester 1					
AACA 3701	**Field Attachment I***	**7**	**8**	**C**	**None**
ACSE 3781	**Agricultural Engineering**	7	12	C	None
AAEC 3751	**Econometrics**	7	16	C	AAEC 3612 (Mathematical Economics & Linear Programming)
AAER 3781	**Resource Economics**	7	12	C	AAEI 3681 (Intermediate Microeconomics)
AAEC 3781	**Farm Planning and Management**	7	12	C	None
AAED 3781	**Development Economics**	7	12	C	None
Total Credits Semester 1					**72**
Year 3 Semester 2					
AAER 3782	**Research Methodology in Agric. Economics**	**7**	**12**	**C**	None
AAEC 3712	**Agricultural Extension**	**7**	**16**	**C**	AAEC 3691 (Rural Sociology)
AAEC 3702	**Entrepreneurship**	**7**	**8**	**C**	None
ACSC 3722	**Crop Storage and Handling**	**7**	**8**	**C**	None
ACSC 3722	**Agricultural Price analysis and Forecasting**	**7**	**12**	**C**	AAEC 3731 (Econometrics)
AAEC 3782	**Agricultural marketing**	**7**	**12**	**C**	None
Total credits Semester 2					**68**
Total CREDITS YEAR 3					**140**

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 4 Semester 1					
AACA 3801	**Field Attachment II**	**8**	**8**	**C**	**None**
AAEC 3810	**Research Project in Agricultural Economics**	8	16	C	AAER3782 (Research Methodology Agricultural Economics)
AAEC 3881	**Project Planning and Management**	8	12	C	None
AAEC 3891	**International**	8	12	C	None

	Agricultural Trade				
AASC 3881	**Beef Production**	8	12	C	None
Total Credits Semester 1					**60**
Year 4 Semester 2					
AAEC 3810	**Research Project in Agricultural Economics**	**8**	**16**	**C**	AAER3782 (Research Methodology Agricultural Economics)
AAEC 3882	**Agricultural Policy Analysis**	**8**	**12**	**C**	None
AAEA 3882	**Agric. Business Management**	**8**	**12**	**C**	None
AASC3892	**Small Ruminant Production**	**8**	**12**	**C**	None
AAEC 3842	**Rural Development**	**8**	**8**	**C**	AAEC 3712 (Agricultural Extension)
Total credits Semester 2					**60**
Total CREDITS YEAR 4					**120**
TOTAL CREDITS FOR THE PROGRAMME					**532**

D.2 MODULE DESCRIPTORS

D.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 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.

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

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

Module Content:

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

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	SBLG3511
NQF Level	4
Contact hours	4 lectures/ week for 14 weeks and one 3-hour practical session per week.
NQF 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.
Prerequisite	NSCC (Biology C or better)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

It will consider organization of life, chemical basis of life, carbohydrates, proteins, nucleic acids, lipids and fats, water, cell structure and function, prokaryotic and eukaryotic cells, ultra-structure of plant and animal cells, cytoskeleton, membrane structure and function, cell communication, mitosis, meiosis, cell reproduction, cell cycle, and cell death. The following topics will be covered: Introduction to systems of classification, taxonomy and binomial nomenclature, including the five kingdoms and the three domein system. Definitions and categories/groups within the five kingdoms, evolution by natural selection (microevolution vs macroevolution), phylogeny and evolutionary relationships in five kingdoms. The course content will also include genes,

chromosomes, genomes, Mendelian genetics, extensions to Mendelian genetics, chromosome theory of inheritance, linkage and cross-over, recombination, sex determination. The course content will also cover an introduction to Ecology: Definitions, history, scales in ecology, application of ecology. Conditions and Resources: Environmental conditions, animals and their resources, plants and their resources.

CEMI3571: BASIC MICROECONOMICS

Module title:	BASIC MICROECONOMICS
Code:	EMI3571
NQF Level:	5
Credits:	16
Contact hours:	4 hours lecture per week for 14 weeks
Module assessment:	Continuous assessment 50%: two tests and one assignment Examination 50%: 1 x 3 hour examination paper
Pre-requisites:	None

Module Content:

Economics is the study of how society allocates scarce resources to satisfy the wants of its members for goods and service. As such, it is a subject concerned with issues of both efficiency and equity. An efficient economy gets the most it can from its scarce resources; an equitable economy fairly distributes the benefits of its resources among its members. Is the economy efficient? Is the economy fair? The course aims to introducing students to key concepts used in microeconomics and facilitate a basic understanding of the economic phenomena. The course is designed to help students understand that society's economic choices often involve trade-offs between efficiency and equity.

LEA3519: ENGLISH FOR ACADEMIC PURPOSES

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

Module Content:

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

SBLG 3512: DIVERSITY OF LIFE

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

Module Content:

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

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

SMAT 3512: PRE-CALCULUS

Module Title: PRE-CALCULUS
Code: SMAT 3512
NQF level: 5
Contact hours: 4 lectures per week for 14 weeks; 2 tutorials per week for 14 weeks
Credits: 16

Module Assessment: Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite: NSSC Mathematics

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

SSTS 3522: INTRODUCTION TO STATISTICS

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

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

CEMA3572: BASIC MACROECONOMICS

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

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

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

D.2.2 SECOND YEAR MODULES

AAEI 3681: INTERMEDIATE MICROECONOMICS

Module Title:	INTERMEDIATE MICROECONOMICS
Code	AAEI 3681
NQF Level	6
NQF Credits	12
Contact hours	3 lectures per week for 14 weeks
Assessment Strategies:	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
Prerequisite	CEMI 3571Basic Microeconomics
Compulsory/Elective	Compulsory
Semester Offered	1

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

AAEC 3691: RURAL SOCIOLOGY

Module Title:	RURAL SOCIOLOGY
Code	AAEC 3691
NQF Level	6
NQF Credits	12
Contact hours	3 lectures per week for 14 weeks
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
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.

AAEF 3681: FINANCIAL MANAGEMENT

Module Title:	FINANCIAL MANAGEMENT
Code	AAEF 3681
NQF Level	6
NQF Credits	12
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
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).

AAEA 3681: AGRICULTURAL COMMUNICATION AND GROUP DYNAMICS

Module Title:	AGRICULTURAL COMMUNICATION AND GROUP DYNAMICS
Code	AAEA 3681
NQF Level	6
NQF Credits	12
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
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;

AAEC 3682: PRODUCTION ECONOMICS

Module Title:	PRODUCTION ECONOMICS
Code	AAEC 3682
NQF Level	6
NQF Credits	12
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
Contact hours	3 lectures per week for 14 weeks and 1hour of practical/week
Prerequisite	CEMI 3571 Basic Microeconomics
Compulsory/Elective	Compulsory
Semester Offered	2

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

AAEI 3682: INTERMEDIATE MACROECONOMICS

Module Title:	INTERMEDIATE MACROECONOMICS
Code	AAEI 3682
NQF Level	6
NQF Credits	12
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

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.

AEC 3612: MATHEMATICAL ECONOMICS AND LINEAR PROGRAMMING

Module Title:	MATHEMATICAL ECONOMICS AND LINEAR PROGRAMMING
Code	AEC 3612
NQF Level	6
NQF Credits	16
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 3 hour paper)
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.

D.2.3 THIRD YEAR MODULES

AACA 3701: FIELD ATTACHMENT I

Module Title:	FIELD ATTACHMENT I
Code	AACA 3701
NQF Level	7
NQF Credits	8
Assessment Strategies	Continuous assessment 40% (Class oral presentation); 60% (report write up.)
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.

AAEC 3751: ECONOMETRICS

Module Title:	ECONOMETRICS
Code	AAEC 3751
NQF Level	7
NQF Credits	16
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 3 hour paper)
Contact Hours	4 lectures per week for 14 weeks; 2 practical hours per week for 14 weeks
Co-requisite	AAEC 3612 Mathematical Economics & Linear Programming
Compulsory/Elective	Compulsory
Semester Offered	1

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

AAER 3781: RESOURCE ECONOMICS

Module Title:	RESOURCE ECONOMICS
Code	AAER 3781
NQF Level	7
NQF Credits	12
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
Contact Hours	3 lectures per week for 14 weeks; 1 practical for 1 hour alternate week for 14 weeks
Prerequisite	AAEI 3681 Intermediate Microeconomics
Compulsory/Elective	Compulsory
Semester Offered	1

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

AAEC 3781: FARM PLANNING AND MANAGEMENT

Module Title:	FARM PLANNING AND MANAGEMENT
Code	AAEC 3781
NQF Level	7
NQF Credits	12
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
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.

AAED 3781: DEVELOPMENT ECONOMICS

Module Title:	DEVELOPMENT ECONOMICS
Code	AAED 3781
NQF Level	7
NQF Credits	12
Assessment Strategies:	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
Contact Hours	3 lectures per week for 14 weeks; 1 practical for 1 hour alternate week for 14 weeks
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course is an introduction to the field of development economics, focusing on some keys questions such as: why some countries poor and others rich? Why some countries experienced rapid economic development while others are trapped in poverty? It also reviews policy issues which developing countries can pursue to best address poverty and underdevelopment.

These are just few of the many questions that this course will deal with. Last but not the least, the course looks at how international factors such as trade and foreign investment affect a countries economic development.
The course is divided into 3 main parts. PART I: Defining and Measuring Economic Development: the millennium development goals, human development index, measuring inequality, measuring poverty. PART II: Domestic Development Policy: Theories of economic development; human capital and development; rural-urban migration; agricultural markets and development. PART III: International Policies: Trade and development; balance of payment and debt crisis; foreign sources of finance, financial markets and government policy.

AAER 3782: RESEARCH METHODOLOGY IN AGRICULTURAL ECONOMICS

Module Title:	RESEARCH METHODOLOGY IN AGRICULTURAL ECONOMICS
Code	AAER 3782
NQF Level	7
NQF Credits	12
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
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.

AAEC 3712: AGRICULTURAL EXTENSION

Module Title:	AGRICULTURAL EXTENSION
Code	AAEC 3712
NQF Level	7
NQF Credits	16
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 3 hour paper)
Contact Hours	4 lectures per week for 14 weeks; 1 practical for 1 hour per week for 14 weeks
Prerequisite	AAEC 3691 Rural Sociology
Compulsory/Elective	Compulsory
Semester Offered	2

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

AAEC 3702: ENTREPRENEURSHIP

Module Title:	ENTREPRENEURSHIP
Code	AAEC 3702
NQF Level	7
NQF Credits	8
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
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).

AAEA 3782: AGRICULTURAL PRICE ANALYSIS AND FORECASTING

Module Title:	AGRICULTURAL PRICE ANALYSIS AND FORECASTING
Code	AAEA 3782
NQF Level	7
NQF Credits	12
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
Contact Hours	3 lectures per week for 14 weeks; 2 hours practicals per week for 14 weeks
Co-requisite	AAEC 3731 Econometrics
Compulsory/Elective	Compulsory
Semester Offered	2

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

AAEC 3782: AGRICULTURAL MARKETING

Module Title:	AGRICULTURAL MARKETING
Code	AAEC 3782
NQF Level	7
NQF Credits	12
Assessment Strategies:	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
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.

D.2.4 FOURTH YEAR MODULES

AACA 3801: FIELD ATTACHMENT II

Module Title:	FIELD ATTACHMENT II
Code	AACA 3801
NQF Level	8
NQF Credits	8
Assessment Strategies	40% (Class oral presentation); 60% (report write up.)
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.

AAEC 3810: RESEARCH PROJECT IN AGRICULTURAL ECONOMICS

Module Title: RESEARCH PROJECT IN AGRICULTURAL ECONOMICS
Code AAEC 3810
NQF Level 8
NQF Credits 32
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
Contact Hours 1 hour per week for 28 weeks
Prerequisite AAER 3782 Research Methodology in Agricultural Economics
Compulsory/Elective Compulsory
Semester Offered 1 & 2

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

AAEC 3881: PROJECT PLANNING AND MANAGEMENT

Module Title: PROJECT PLANNING AND MANAGEMENT
Code AAEC 3881
NQF Level 8
NQF Credits 12
Assessment Strategies: Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
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

AAEC 3891: INTERNATIONAL AGRICULTURAL TRADE

Module Title: INTERNATIONAL AGRICULTURAL TRADE
Code AAEC 3891
NQF Level 8
NQF Credits 12

Assessment Strategies:	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
Contact Hours	3 lectures per week for 14 week; 1 practical for 1.5hours alternate week for 14 weeks
Compulsory/Elective	Compulsory
Prerequisite	None
Semester Offered	1

Module Aims:
The course exposes students to concepts and theories of international agricultural trade and policy for exporting countries and importing countries

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

AAEC 3882: AGRICULTURAL POLICY ANALYSIS

Module Title:	AGRICULTURAL POLICY ANALYSIS
Code	AAEC 3882
NQF Level	8
NQF Credits	12
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
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.

AAEA 3882: AGRIBUSINESS MANAGEMENT

Module Title:	AGRIBUSINESS MANAGEMENT
Code	AAEA 3882
NQF Level	8
NQF Credits	12
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)
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.

AAEC 3842: RURAL DEVELOPMENT

Module Title:	RURAL DEVELOPMENT
Code	AAEC 3842
NQF Level	8
NQF Credits	8
Assessment Strategies:	Continuous assessment 40% (minimum 2 tests and 1 assignment); Examination 60% (1 x 2 hour paper)

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.

E. 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 School of Science. English Communication and Study Skills, English for Academic Purposes, Contemporary Social Issues and Computer Literacy are University Core Modules taken by all First Year University of Namibia students.

E.1 PROGRAMME SCHEDULE

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

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 2 Semester 1					
AAEC 3681	**Principles of Microeconomics**	**6**	**12**	**C**	**None**
AAEC 3691	**Rural Sociology**	6	12	C	None
AASC 3681	**Genetics**	6	12	C	None
AASC 3691	**Introduction to Range Management**	6	12	C	None
ACRS 3681	**Biostatistics**	6	12	C	None
ACSC 3691	**Agronomy**	**6**	**12**	**C**	None
AFST 3681	**General Microbiology**	6	12	C	
Total Credits Semester 1					**72**
Year 2 Semester 2					
AAEC 3682	**Production Economics**	**6**	**12**	**C**	None
AASC 3612	**Biochemistry**	**6**	**16**	**C**	SCHM 3532

					(Chemistry for Life Sciences)
AASC 3602	**Livestock Production Systems**	**6**	**8**	**C**	None
AFST 3602	**Food Technology**	**6**	**8**	**C**	None
Total credits Semester 2					**56**
Total CREDITS YEAR 2					**128**
Course Code	**Course name**	**NQF Level**	**Credits**	**Compulsory (C) / Elective (E)**	**(Co-requisite) / Pre-requisite**
Year 3 Semester 1					
AACA 3701	**Field Attachment I***	**7**	8	**C**	None
AASC 3701	**Animal Nutrition**	**7**	8	**C**	None
ACSE 3781	**Agricultural Engineering**	7	12	C	None
AASC 3701	**Animal Health**	6	12	C	FST 3681 (General Microbiology)
AASC3792	**Animal Breeding**	7	12	C	AASC3681 (Genetics)
AAEC 3781	**Farm Planning and Management**	7	12	C	None
AASC 3711	**Animal Anatomy & Physiology**	7	16	C	None
Total Credits Semester 1					**76**
Year 3 Semester 2					
ACSC 3792	**Research Methods**	**7**	**12**	**C**	ACRS 3681 (Biostatistics)
AAEC 3712	**Agricultural Extension**	**7**	**16**	**C**	None
AASF 3702	**Feeds and Feeding**	**7**	**8**	**C**	AASC 3701 (Animal Nutrition)
AASC3741	**Game Ranching**	**7**	**8**	**C**	None
AAEC 3702	**Entrepreneurship**	**7**	**8**	**C**	None
AAEC 3782	**Agricultural marketing**	**7**	**12**	**C**	None
Total credits Semester 2					**68**
Total CREDITS YEAR 3					**144**

Course Code	**Course name**	**NQF Level**	**Credits**	**Compulsory (C) / Elective (E)**	**(Co-requisite) / Pre-requisite**
Year 4 Semester 1					
AACA 3801	**Field Attachment II**	8	8	**C**	AACA 3708 (Field Attachment I)
ACSC 3810	**Research Project**	8	16	C	ACSC 3792 (Research Methods)
AAEC 3881	**Project Planning and Management**	8	12	C	None
AASC 3811	**Range and Pasture Management**	8	16	C	None
AASC 3881	**Beef Production**	8	12	C	None
AASC 3821	**Poultry Production**	8	8	C	None
Total Credits Semester 1					**72**
Year 4 Semester 2					
AASC 3810	**Research Project**	**8**	**16**	**C**	ACSC 3792

					(Research Methods
AASC3892	**Small Ruminant Production**	**8**	**12**	**C**	None
AASC 3802	**Dairy Production**	**8**	**8**	**C**	None
AASM 3882	**Meat Science**	**8**	**12**	**C**	None
AASB 3882	**Biotechnology of Animal Reproduction**	**8**	**12**	**C**	None
AASC 3822	**Pig Production**	**8**	**8**	**C**	None
Total credits Semester 2					**68**
Total CREDITS YEAR 4					**140**
TOTAL CREDITS FOR THE PROGRAMME					**548**

E.2. MODULE DESCRIPTORS

E.2.1 FIRST YEAR MODULES

CLC3509 COMPUTER LITERACY

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

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

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

Module 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	SBLG3511
NQF Level	4
Contact hours	4 lectures/ week for 14 weeks and one 3-hour practical session per week.
NQF 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.
Prerequisite	NSCC (Biology C or better)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

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

SPHY 3501: PHYSICS FOR LIFE SCIENCES I

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

Module Content:

This module is to introduce Life science students to physics concepts and applications that will be useful to them in their undergraduate studies and carrier. The course will cover the following topics:

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

SMAT 3511: BASIC MATHEMATICS

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

Module Content:

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

LEA3519 ENGLISH FOR ACADEMIC PURPOSES

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

Module Content:

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

SCHM 3532: CHEMISTRY FOR LIFE SCIENCES

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

Module Content:

Classification of Matter: Mixtures and Pure substances; Physical States of Matter; Physical and Chemical Properties. Extensive and Intensive properties.
Measurements: Units, Significant figures; Precision and Accuracy, Factor Label Method. Atomic structure and the Periodic table; Electron configuration; Physical and Chemical properties as predicted from groups. Ionic compounds and Molecular compounds: Writing chemical formulae and naming of ionic and molecular compounds. Average Atomic Mass. The Mole Concept; Percent

Composition, Empirical formula and Molecular formula. Stoichiometry: limiting reagent, percent yield. Solutions: electrolytes and non-electrolytes, aqueous solutions, ionic equations; concentrations: percent concentration; molarity, molality; dilution of solutions; structure and solubility. Types of bonds; Lewis structures; Resonance structures; Molecular geometry: the VSEPR model, Polarity of molecules. Acid-base equilibrium: properties of acids and bases; relations of acids and bases, self ionisation of water; strengths of acids and bases; the pH scale; hydrolysis of salts; buffers; acid-base titration. Introduction to organic chemistry: organic compounds; structural formulae and conformations; functional groups; Classes of hydrocarbons: alkanes, cycloalkanes: alkanes; alkenes and alkynes; oxidation and reduction; addition reactions; stereo-isomerism. Alcohols, phenols, thiols, ethers: organic compounds of oxygen; common alcohols and phenols. Carboxylic acids and esters, amines and amides: Introduction to carbohydrates, lipids and porphyrins.

SPHY 3532: PHYSICS FOR LIFE SCIENCES II

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

Module Content:

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

SBLG3512: DIVERSITY OF LIFE

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

Module Content:

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

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

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

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

E.2.2 SECOND YEAR MODULES

AASC3681: GENETICS

Module Title:	GENETICS
Code	AASC 3681
NQF Level	6
NQF Credits	12
Contact Hours	3 x 1 hour Lectures / week for 14 weeks (42hours); Practicals: 1X 3 hour s /fort weekly for 7 weeks (21 hours)
Assessment Strategies	Continuous Assessment: 40% (2 tests + at least 5x marked practicals / assignments). Exam: 60% (1 x2 hour paper).
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This cource introduce and presents principles and methods used in the study of genetics. The emphasis is on application of concepts to solve problems. The course provides a foundation for more advanced studies in the field of agriculture and veterinary medicine. The specific topics to be covered are:
The molecular structure of nucleic acids (DNA and RNA) and gene expression: The double helix model of DNA; Transcription, Translation and the Genetic Code; Regulation of gene expression – the Lac operon; DNA replication in prokaryotes and eukaryotes.
Extension of Mendelian analysis and ratio: Incomplete dominance; co-dominance; multiple allelism; gene interactions; pleiotropy; epistasis; lethal genes, additive gene action.
Chromosomal basis of heredity: Physical structure of chromosomes and DNA Packaging; Karyotypes and Variations; gene linkage; genetic mapping.
Introduction to Quantitative Genetics: Polygenic inheritance; Analysis of polygenic traits; Heritability
Other topics to be covered include: The molecular organization of prokaryotic and eukaryotic genomes; Molecular structure of genes; The Cell Cycle; Mitosis and its genetic significance; Meiosis and its genetic significance; Mutations (types, causes, detection and significance); Sex determination; Sex linkage; sex-limited and sex-influenced.

The module also introduces students to molecular biology techniques: Genetic engineering or recombinant DNA technology; DNA extraction; Polymerase Chain Reaction (PCR); DNA electrophoresis and sequencing; gene cloning; animal cloning and marker-assisted selection.

AASC 3691: INTRODUCTION TO RANGE MANAGEME

Module Title:	INTRODUCTION TO RANGE MANAGEMENT
Code	AASC 3691
NQF Level	6
NQF Credits	12
Contact hours:	3 x 1 hour Lecturers / week for 14 weeks; 03 Practical hours alternate weeks for 14 weeks
Assessment Strategies	Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals). Exam: 60% (1 x2 hr paper)
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

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.

AASC 3612: BIOCHEMISTRY

Module Title:	BIOCHEMISTRY
Code	AASC 3612
NQF Level	6
NQF Credits	16
Contact Hours	4 x 1 hour Lectures / week for 14 weeks (56 hours); Practicals: 1X 3 hours /fort weekly for 7 weeks (21 hours)
Assessment Strategies	Continuous Assessment: 40% (2 tests + at least 5x marked practicals / assignments). Exam: 60% (1 x3 hour paper).
Prerequisite	Chemistry for Life Sciences (CHM3532)
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

Under this course the students will learn about:

PHYSICAL BIOCHEMISTRY: Acids, bases, buffers, pH, ionic strength, molarity; water (structure and ionization).

STRUCTURAL BIOCHEMISTRY: Structure and function of macromolecules (carbohydrates, proteins and lipids), Vitamins, Coenzymes and Cofactors.

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

BIOENERGETICS AND THERMODYNAMICS: Free Energy, Laws of Energy, Activation Energy, Transition States, Endergonic and exergonic reactions.

METABOLISM: Catabolism and Anabolism; Carbohydrate catabolism (Glycolysis, Alcohol and lactic acid Metabolism, Tricarboxylic acid cycle or the TCA cycle; Electron transport chain and oxidative phosphorylation); Regulation of carbohydrate metabolism; Gluconeogenesis; Synthesis of the disaccharides (lactose and sucrose); Synthesis of polysaccharides (starch and glycogen); Lipid metabolism (β-oxidation, malonly CoA); Integration of carbohydrate and fat metabolism; Amino acids and protein metabolism; Urea cycle; The Cori cycle; Pentose phosphate pathway; Glyoxylate cycle in oily seeds.

SPECTROPHOTOMETRY: Fundamental laws of spectrophotometry and absorbance.

AASC 3602: LIVESTOCK PRODUCTION SYSTEMS

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; weeks 03 Practical hours alternate weeks for 14
Assessment Strategies	Continuous Assessment: 40% (2x assignments + 2 tests + at least 5x marked practicals). Exam: 60% (1 x2 hr paper)
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

E.2.3 THIRD YEAR MODULES

AACA 3701: FIELD ATTACHMENT I

Module Title:	FIELD ATTACHMENT I
Code	AACA 3701

NQF Level	7
NQF Credits	8
Contact Hours	6 weeks of Field Attachment
Assessment Strategies	40% (Class oral presentation); 60% (report write up.)
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.

AASC 3701: ANIMAL NUTRITION

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

AASC 3791: ANIMAL HEALTH

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
Assessment Strategies	Continuous Assessment: 40% (2x assignments + 2 tests + at least 5x marked practicals); Exam: 60% (1 x2 hr paper)
Prerequisite	FST 3681 (General Microbiology)
Compulsory/Elective	Compulsory
Semester Offered	1

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

hepatica, Echinococcosis, ECTOPARASITES: Mange, Sarcoptic, Chorioptic, Demodecosis. Ticks – hard and soft ticks, Lice, Flies, Fleas,

AASC 3741: GAME RANCHING

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
Assessment Strategies	Continuous Assessment: 40% (2x assignments + 2 tests + at least 10 marked practicals). Exam: 60% (1 x2 hr paper)
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

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

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

AASC 3711: ANIMAL ANATOMY AND PHYSIOLOGY

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

AASF 3702: FEEDS AND FEEDING

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

Assessment Strategies	Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals). Exam: 60% (1 x2 hr paper)
Co-requisite	Animal Nutrition (AASC 3701)
Compulsory/Elective	Compulsory
Semester Offered	2

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

AASC 3792: ANIMAL BREEDING

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
Assessment Strategies	Continuous Assessment: 40% (7 x assignments + 2 tests + 1 written report). Exam: 60% (1 x2 hr paper)
Prerequisite	Genetics (AASC 3601)
Compulsory/Elective	Compulsory
Semester Offered	1

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.

E.2.4 FOURTH YEAR MODULES

AACA 3801: FIELD ATTACHMENT II

Module Title:	FIELD ATTACHMENT II
Code	AACA 3801
NQF Level	8
NQF Credits	8
Contact Hours	8 practical hours per day for 6 weeks
Assessment Strategies	40% (Class oral presentation); 60% (report write up.)
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.

AASC 3810: RESEARCH PROJECT

Module Title:	RESEARCH PROJECT
Code	AASC 3810
NQF Level	8
NQF Credits	32
Contact hours:	32 hours
Assessment Strategies	Continuous Assessment: Continuous assessment 40% (oral presentation) 60% Project write-up
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.

AASC 3811: RANGE AND PASTURE MANAGEMENT

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

AASC 3881: BEEF PRODUCTION

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

AASC 3821: POULTRY PRODUCTION

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 14weeks
Assessment Strategies	Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals)Exam: 60% (1 x2 hr paper)
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.

AASC 3882: SMALL RUMINANT PRODUCTION

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

AASC 3802: DAIRY PRODUCTION

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
Assessment Strategies	Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals). Exam: 60% (1 x2 hr paper)
Prerequisite	None
Semester Offered	2

Module Content:

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

AASM 3882: MEAT SCIENCE

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

AASB 3882: BIOTECHNOLOGY OF ANIMAL REPRODUCTION

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 for 14 weeks
Assessment Strategies	Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals). Exam: 60% (1 x2 hr paper)
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;

AASC 3822: PIG PRODUCTION

Module Title:	PIG PRODUCTION
Code	AASC 3822
NQF Level	7
NQF Credits	8
Contact hours:	2 x 1 hour Lectures / week for 14 weeks; for 14 weeks; 03 Practical hours alternate weeks for 14 weeks
Assessment Strategies	Continuous Assessment: 40% (2x assignments + 2 tests + at least 5 marked practicals); Exam: 60% (1 x2 hr paper)
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.

F. 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 School 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 EXEMPTIONS:

On the completion of the UNAM Diploma in Agriculture, the students will receive credits for the following first and second year courses in Bachelor of Science in Agriculture (Crop Science). Students could register for modules in the Second Year and Third Year in addition to the following modules: English for Academic Purpose, Basic Mathematics, Plant Breeding, Farm Planning and Management, Biostatistics, Principles of Micro Economics, and Genetics.

The list of equivalents for which credits (Exemption) will be given is listed below:

Diploma in Agriculture	Bachelor of Science in Agriculture (Crop Science) Honours
Course	**Course**
LEG2410 English for General Communication	**LCE3419 English for Communication and Study Skills**
CLC3509 Computer Literacy	**CLC3509 Computer Literacy**
CSI3580 Contemporary Social Issues	**CSI3580 Contemporary Social Issues**
AEC521 Intro to Rural Sociology **AEC2422 Comm. and Info Systems** **AEC2601 Extension Methods**	**AEC3691 Rural Sociology**
ASC2431 Biology	**BLG3511 Introduction to Biology**
CSC2602 Crop Production **CSC2532 Vegetable & Fruits Production**	**CSC3681 Plant Science**
CSC2602 Crop Production **CSC2532 Vegetable & Fruits Production**	**CSC3691 Agronomy**
ASC2432 Physical Science	**PHY3501 Physics for Life Science**
ASC2502 Applied Animal Breeding **ASC2681 Intensive Animal Production** **ASC2642 Extensive Animal Production**	**ASC3602 Livestock Production Systems**
ASC2431 Biology **CSC2412 Principles of Crop Production** **ASC2502 Applied Animal Breeding** **ASC2411 Physical Science**	**BLG3512 Diversity of Life**
CSC2581 Soil Science **CSC2601 Water Management and Soil Conservation**	**CHM3532 Chemistry for Life Science**
CSC2581 Soil Science	**CRS3682 Soil Science for Crop Production**
CSC2682 Farm Power Machinery	**CSE3781 Agricultural Engineering**

F.2 PROGRAMME SCHEDULE

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 1 Semester 1					
UCLC 3509	**Computer Literacy**	**5**	**8**	**C**	
ULCE 3419	**English Communication and Study Skills**	4	16	C	
UCSI 3580	**Contemporary Social Issues**	5	8	C	
SBLG 3511	**Introduction to Biology**	5	16	C	
SPHY 3501	**Physics for Life Sciences I**	5	8	C	

SMAT 3511	**Basic Mathematics**	5	16	C	
Total Credits Semester 1					**72**
Year 1 Semester 2					
ULEA 3519	**English for Academic Purposes**	**5**	**16**	**C**	
SCHM 3532	**Chemistry for Life Sciences**	**5**	**16**	**C**	
SPHY 3532	**Physics for Life Sciences II**	**5**	**16**	**C**	
SBLG 3512	**Diversity of Life**	**5**	**16**	**C**	
SMAT3512	**Pre-calculus**	**5**	**16**	**C**	
Total credits Semester 2					**80**
Total CREDITS YEAR 1					**152**

Course Code	**Course name**	**NQF Level**	**Credits**	**Compulsory (C) / Elective (E)**	**(Co-requisite) / Pre-requisite**
Year 2 Semester 1					
AAEC 3681	**Principles of Microeconomics**	**6**	**12**	**C**	**None**
AAEC 3691	**Rural Sociology**	6	12	C	None
AASC 3681	**Genetics**	6	12	C	None
ACSC3681	**Plant Science**	6	12	C	None
ACRS 3681	**Biostatistics**	6	12	C	None
ACSC 3691	**Agronomy**	6	12	C	
Total Credits Semester 1					**72**
Year 2 Semester 2					
AAEC 3682	**Production Economics**	**6**	**12**	**C**	None
AAEC 3692	**Principles of Macroeconomics**	**6**	**12**	**C**	None
AASC 3612	**Biochemistry**	**6**	**16**	**C**	SCHM 3532 (Chemistry for Life Sciences)
AASC 3602	**Livestock Production Systems**	**6**	**8**	**C**	None
ACRS3682	**Soil Science for Crop Production**	**6**	**12**	**C**	None
Total credits Semester 2					**60**
Total CREDITS YEAR 2					**132**

Course Code	**Course name**	**NQF Level**	**Credits**	**Compulsory (C) / Elective (E)**	**(Co-requisite) / Pre-requisite**
Year 3 Semester 1					
ACSE 3781	**Agricultural Engineering**	**7**	12	**C**	None
ACSC 3791	**Field Crop Production**	7	12	C	ACSC 3681 (Plant Science)
ACSC 3721	**Weed Science**	7	8	C	None

AACA 3701	**Field Attachment I**	7	8	C	None
ACRS3781	**Plant Breeding**	7	12	C	AASC 3681 (Genetics)
AAEC 3781	**Farm Planning and Management**	7	12	C	None
Total Credits Semester 1					**72**
Year 3 Semester 2					
ACSC 3792	**Research Methods**	**7**	**12**	**C**	ACSC 3792 (Research Methods)
ACSC 3702	**Crop Ecophysiology**	**7**	**8**	**C**	ACSC3681 (Plant Science)
ACSC 3722	**Crop Handling and Storage**	**7**	**8**	**C**	None
ACSC 3742	**Farm mechanisation**	**7**	**8**	**C**	ACSE3781 (Agricultural Engineering)
AAEC 3712	**Agricultural Extension**	**7**	**16**	**C**	None
AAEC 3782	**Agricultural Marketing**	**7**	**12**	**C**	None
Total credits Semester 2					**64**
Total CREDITS YEAR 3					**136**
Course Code	**Course name**	**NQF Level**	**Credits**	**Compulsory (C) / Elective (E)**	**(Co-requisite) / Pre-requisite**
Year 4 Semester 1					
AACA 3801	**Field Attachment II**	8	8	**C**	AACA 3708 (Field Attachment I)
ACSC 3810	**Research Project**	8	16	C	ACSC 3792 (Research Methods)
AAEC 3881	**Project Planning and Management**	8	12	C	None
ACSC3741	**Horticulture I, Vegetables, Herbs and Spices**	7	8	C	ACSC3681 (Plant Science) and ACSC3691 (Agronomy)
ACSC 3841	**Seed Science and Technology**	8	8	C	CSC 3681 (Plant Science)
ACSC 3861	**Agricultural Entomology**	8	8	C	None
ACSC3881	**Soil Fertility and Plant Nutrition**	8	12	C	ACRS3682 (Soil Science for Crop Production)
Total Credits Semester 1					**64**
Year 4 Semester 2					
ACSC 3810	**Research Project**	**8**	**16**	**C**	ACSC 3792 (Research Methods
ACSC 3892	**Horticulture II—Fruit Crops and Ornamental Plants**	**8**	**12**	**C**	ACSC 3681 (Plant Science)
ACSC 3802	**Plant Pathology**	**8**	**8**	**C**	None
ACSC 3822	**Plant Biotechnology**	**8**	**8**	**C**	AASC 3681 (Genetics)
ACSC 3812	**Soil Conservation and Irrigation**	**8**	**16**	**C**	ACRS 3682 (Soil Science for Crop Production)
Total credits Semester 2					**60**
Total CREDITS YEAR 4					**124**
TOTAL CREDITS FOR THE PROGRAMME					**544**

F.2. MODULE DESCRIPTORS

F.2.1 FIRST YEAR MODULES

CLC3509 COMPUTER LITERACY

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

Module Content:

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

LCE3419 ENGLISH COMMUNICATION & STUDY SKILLS

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

Module Content:

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

CSI 3580 CONTEMPORARY SOCIAL ISSUES

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

Module 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	SBLG3511
NQF Level	4
Contact hours	4 lectures/ week for 14 weeks and one 3-hour practical session per week.
NQF 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.
Prerequisite	NSCC (Biology C or better)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

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

SPHY 3501: PHYSICS FOR LIFE SCIENCES I

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

Module Content:

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

SMAT 3511: BASIC MATHEMATICS

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

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

LEA3519 ENGLISH FOR ACADEMIC PURPOSES

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

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

SCHM 3532: CHEMISTRY FOR LIFE SCIENCES

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

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

SPHY 3532: PHYSICS FOR LIFE SCIENCES II

Module Title:	PHYSICS FOR LIFE SCIENCES II
Code:	SPHY 3532
NQF Level:	4
Contact Hours:	4 Lectures per week for 14 weeks, Practical Time: 14 sessions (42 hours)
Credits:	16
Module assessment:	Continuous assessment (50%, Minimum 2 tests, 4 assignments and practical reports) and

	Examination (50%,1 x 3-hour paper)
Pre-requisites:	NSSC Physical Science
Co-Requisites:	SPHY 3401: Physics for Life Sciences I; SMAT3511: Basic Mathematics; SMAT3512: Pre-calculus;

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

SBLG3512: DIVERSITY OF LIFE

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

Module Content:
This module is designed to give students a detailed understanding of the diversity of life. It gives students the broader appreciation of biodiversity in the different ecological habitats. The course shall describe diagnostic characteristics of principle taxonomic categories for each phylum. Coverage of each Phylum shall follow a phylogenetic (evolutionary) approach as well as introduce broad ecological and physiological principles. Various aspects of reproduction and development shall be highlighted. This module prepares students to understand subsequent courses such as Introduction to Ecology and Microbiology, Population Ecology, Comparative physiology, Biogeography, Plant and Animal Form and Function
Topics covered will include viral, bacterial, fungal, algal, animal and plant diversity. It then considers the characteristics and life cycles of the following important algae, animal and plant groups: Chlorophyta, Phaeophyta, Rhodophyta, Chrysophyta, Euglenophyta, Pyrrophyta, Cryptophyta, Protostomate phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostomate phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chodrichthyes, Actinopterygii, Actinistia, Dipnoi, Amphibia, Reptilia, Aves, Mammalia) bryophytes, seedless vascular plants, gymnosperms, and the angiosperms. Concepts such as Homology and analogy; body symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered.
Examples from Namibia shall be used where possible and applicable. The course content shall be supplemented with appropriate weekly practical sessions in the laboratory and in the field.

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

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
Module 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.)

F.2.2 SECOND YEAR MODULES

ACSC3681: PLANT SCIENCE

Module title:	Plant Science
Code:	ACSC3681
NQF level:	6
Contact hours:	03 Lecture hours/week for 14 weeks; 02 Practical hours/week for 14 weeks
Credits:	12
Assessment Strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
Prerequisites:	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content

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

ACRS3681: BIOSTATISTICS

Module Title:	Biostatistics
Code	ACRS3681
NQF Level	6
Contact hours	3 Lecture hours/week for 14 weeks; 3 tutorial/practical hours alternate weeks for 14 weeks
Assessment Strategies	Continuous Assessment: 40 % at least three assessments; Examination (60%): (01 x 02 hour examination paper)
NQF Credits	12
Prerequisite	SMAT3511 Basic Mathematics
Compulsory/Elective	Compulsory
Semester Offered	**1**

Module Content:

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

ACSC 3691: AGRONOMY

Module Title:	AGRONOMY
Code	ACSC 3691
NQF Level	6
National Hours	80
Contact hours	02 Lecture hours / week for 14 weeks; 03 Practical hours / week for 14 weeks
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hour paper)
NQF Credits	12

Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

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

ACRS3682: SOIL SCIENCE FOR CROP PRODUCTION

Module Title:	SOIL SCIENCE FOR CROP PRODUCTION
Code	ACRS3682
NQF Level	6
Contact hours	03 Lecture hours / week for 14 weeks; 02 Practical hours / week for 14 weeks
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hour paper)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

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

F.2.3 THIRD YEAR MODULES

ACSC3791: FIELD CROP PRODUCTION

Module Title:	Field Crop Production
Code	ACSC 3791
NQF Level	7
Contact hours	03 Lecture hours / week for 14 weeks; 02 Practical hours / week for 14 weeks
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hour paper)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

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

ACSE3781: AGRICULTURAL ENGINEERING

Module Title:	AGRICULTURAL ENGINEERING
Code	ACSE3781
NQF Level	7
Contact hours	03 Lecture hours / week for 14 weeks; 02 Practical hours / week for 14 weeks
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hour paper)

NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

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.

ACSC3741: HORTICULTURE I—VEGETABLES, HERBS AND SPICES

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

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

ACSC 3721: WEED SCIENCE

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
Assessment Strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

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

AACA 3701: FIELD ATTACHMENT I

Module Title:	FIELD ATTACHMENT I
Code	AACA 3701
NQF Level	7
Contact hours	6 weeks
Assessment Strategies	Final assessment 100% (Attachment report and Oral Presentation)
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.

ACRS 3781: PLANT BREEDING

Module Title:	PLANT BREEDING
Code	ACRS 3781
NQF Level	7
Contact hours	03 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
Assessment strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
NQF Credits	12
Prerequisite	AASC 3681 Genetics
Compulsory/Elective	Compulsory
Semester Offered	1

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

ACSC 3792: RESEARCH METHODS

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
Assessment strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
NQF Credits	12
Co-requisite	ACRS 3681: BIOSTATISTICS
Compulsory/Elective	Compulsory
Semester Offered	2

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

ACSC 3702: CROP ECOPHYSIOLOGY

Module Title:	CROP ECOPHYSIOLOGY
Code	ACSC 3702
NQF Level	7

Contact hours	02 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
Assessment strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
NQF Credits	8
Pre-requisite	ACSC 3681 Plant Science
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Growth analysis. Factors affecting growth and development: light penetration into crop, amount and quality of light. Factors affecting transpiration. Development, differentiation and yield. Yield components and their limitations: Law of the minimum. Water potential. Water use efficiency. Biological nitrogen fixation. Factors affecting germination, dormancy. Factors affecting root growth and distribution. Factors affecting leaf and stem growth, branching
Flowering. Maturation and ripening. Senescence and abscession. Physiology of stress – abiotic (heat, acidity, water) and biotic stresses.

ACSC 3722: CROP STORAGE AND HANDLING

Module Title:	CROP STORAGE AND HANDLING
Code	ACSC 3722
NQF Level	7
Contact hours	02 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
Assessment strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
NQF Credits	8
Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
The Post-harvest system: Post-harvest systems for various crops. Properties of crop commodities: Physical, mechanical and thermal properties of crops which affect their storage and handling. Crop drying. Energy required for drying. Natural drying, Artificial drying, Psychometrics. Equilibrium moisture relationships, Behaviour of moisture in grain bulk/stacks. Moisture content determination. Moisture metre calibration. Types and maintenance of driers: Safe temperatures for drying.Drying methods. Psychometrics.Types of driers.Types of farm storage structures: Silos, sheds, warehouses and open stacks, bunkers, Management of storage facilities. Stacking and movement of commodities. Storage losses including loss assessment methods. Review of Biology of Storage Pests and Pest Infestation Control.Processing of agricultural crops: Threshing. Shelling. Milling. Threshing and shelling efficiency Oil expression

Rice threshing at Ogongo Handling and storage of horticultural and perishable Crops: Causes of losses e.g. physiological changes, mechanical damage, pests and diseases. Quality assessment. Conservation techniques for horticultural crops.Material handling equipment: Material movement into and within storage structures for large scale structures: Folk lift, Screw conveyor, Belt conveyor, Bucket elevator, Pneumatic conveyor

ACSC 3742: FARM MECHANISATION

Module Title:	FARM MECHANISATION
Code	ACSC 3742
NQF Level	7
Contact hours	02 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
Assessment strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
NQF Credits	8
Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

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

F.2.4 FOURTH YEAR MODULES

ACSC 3810: RESEARCH PROJECT

Module Title:	RESEARCH PROJECT
Code	ACSC 3810
NQF Level	8
Contact hours	Equivalent to 1 hour per week for 28 weeks
NQF Credits	32
Pre-requisite	ACSC 3792: Research Methods
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

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

AACA 3801: FIELD ATTACHMENT II

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

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

ACSC 3841: SEED SCIENCE AND TECHNOLOGY

Module Title:	SEED SCIENCE AND TECHNOLOGY
Code	ACSC 3841
NQF Level	8
Contact hours	02 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
Assessment strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
NQF Credits	8
Pre-requisite	ACSC 3681 Plant Science
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

Importance of quality seed for crop production. Review of cultivar development: selection methods, variety evaluation and release. Types of cultivars: purelines, hybrids, synthetics, open pollinated populations. DUS-test. Seed ecology: review of plant growth and seed development: growth factors affecting seed quality. Seed germination and Seed dormancy. Seed multiplication: organization, suitable areas, and agronomy. Harvesting and threshing methods. Processing: drying, cleaning, treatment, grading. Storage: packaging, factors affecting storage: packaging, factors affecting storage life. Seed quality control: legislation, certification, inspection, testing. Marketing and distribution: demand forecasting, supply, pricing. Seed production of important crops of Namibia.

ACSC 3861: AGRICULTURAL ENTOMOLOGY

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
Assessment strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
NQF Credits	8
Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

Effects of insects on crops. Insect structures and life cycles: Body parts, maintenance and locomotion, sensory organs, reproduction. Insect classification economically important insect orders. Grouping of insect in relation to host damage and pest control: chewing insects, piercing and sucking insects. Population dynamics: Economic threshold. Insect sampling techniques: transects, traps, mark-release-recapture. Causes of success of insects. Insect control measures: preventative, chemical, cultural, biological, physical, integrated insect control. History and classification of insecticides: organochlorine insecticides, Organophosphorus insecticides, carbamates, pyrethroids, insecticide resistance. Integrated pest management. Environmental issues related to insecticides: effects on food chain, persistent insecticides, banned insecticides, environmental protection legislation and enforcement. Field pests of horticultural and field crops in Namibia. Pests of stored crops in Namibia.

ACSC 3881: SOIL FERTILITY AND PLANT NUTRITION

Module Title:	SOIL FERTILITY AND PLANT NUTRITION
Code	ACSC 3881
NQF Level	8
Contact hours	03 Lecture hours / week for 14 weeks 02 Practical hours / week for 14 weeks
NQF Credits	12
Pre-requisite	ACRS 3682 Soil Science for Crop Production
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

Soil organic matter: carbon cycle, CO2 global warming, bioassay, response to management practices. Review of plant nutrients: macronutrients, micronutirents. . Functions of each nutrients in plant metabolism and growth. Review of basic soil chemistry concepts: soil pH and nutrient availability, soil colloids and cation exchange. Solubility equilibria as applied to nutrient and solubility and movement. Mobility of major nutrients in the soil and in the plant. Salinity: meaning measurement and amendment. Soil acidity and alkalinity and amendment: liming requirements. Fertilizers: nutrients content, solubility, fertilizer formulations, losses; types of fertilizers—single fertilizers, compound fertilizers, Law of the minimum. Soil and plant analysis. Integrated nutrient management. Brief overview of nutrient deficiency symptoms.

ACSC 3892: HORTICULTURE II—Fruit Crops and Ornamental Plants

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

Assessment strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
NQF Credits	12
Pre-requisite	ACSC 3681 Plant Science
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Fruit and Nut production: Importance of fruits and nuts to human nutrition and the economy. Plant propagation techniques applicable to fruit species: seed propagation: genetic segregation and disadvantages of seed propagation for fruit and ornamental plants; uniformity, consistent quality and vegetative—stem cuttings, air layering, grafting, in vitro culture plantlets. Specific environmental requirements of fruit trees. Specifics in cultivation systems of fruit trees. Tree nursery management. Main tropical and subtropical fruit species – their propagation, cultivation, harvest and handling. Indigenous fruit species: propagation and adaptation challenges. Stimulants – coffee, tea, cocoa – their propagation, cultivation, harvest and handling. Pollination requirements for some fruit tree species: importance of bees, establishment and maintenance of bee colonies. Fruit and nut harvesting: properties of fruits and nuts in respect to handling and shelf life. Ornamental and landscape plants – most common indoor and outdoor ornamental species – their propagation, cultivation and utilization. Use of plant growth regulators in fruit and ornamental plants.

ACSC 3802: PLANT PATHOLOGY

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
Assessment strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
NQF Credits	8
Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	2
Module Content:	

Definition of disease. Life cycles and dispersal of fungi and bacteria. Viruses. Parasite-host interactions: antibiosis. Characteristics of major groups of plant pathogenic fungi, bacteria and viruses. Plant disease epidemiology. Methods for assessing crop losses. Methods of control: agronomic, tolerant or resistant crops and cultivars, fungicides used, seed treatment. Classification of fungicides. Effects of fungicides on environment. Biological control. Costs/benefits of control methods.

ACSC 3822: PLANT BIOTECHNOLOGY

Module Title:	PLANT BIOTECHNOLOGY
Code	ACSC 3822
NQF Level	8
Notional Hours	80
Contact hours	02Lecture hours / week for 14 weeks 02 Practical hours / alternate week for 14 weeks
Assessment strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (01 x 02 hours paper)
NQF Credits	8
Pre-requisite	AASC 3681 Genetics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Plant tissue culture – concept of totipotency, culture media composition and environmental conditions. Micro-propagation. Direct and indirect organogenesis and non-zygotic embryogenesis, somaclonal variation and in vitro mutagenesis. Embryo rescue. Protoplast culture and regeneration. Production of haploid plants. Production of secondary metabolites. Cryopreservation. DNA isolation and amplification (PCR). Molecular analysis of DNA, RNA, and proteins. Basics of marker assisted selection. Recombinant

DNA. Direct and indirect gene transfer. GMO's and bio-safety: issues relating to bio-safety, international bio-safety protocols, bio-safety legislation and regulation in Namibia.

ACSC 3812: SOIL CONVERSATION AND IRRIGATION

Module Title:	SOIL CONVERSATION AND IRRIGATION
Code	ACSC 3812
NQF Level	8
Notional Hours	80
Contact Hours	04 Lecture hours / week for 14 weeks 03 Practical hours / alternate week for 14 weeks
Assessment strategies	Continuous Assessment: 40% (1x assignments + 2 tests + at least 3 marked practicals). Exam: 60% (1 x3 hr paper)
NQF Credits	8
Pre-requisite	ACRS3682: Soil Science and Crop Producation
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

Soil conservation: Causes of and types of soil erosion in Namibia. Estimating soil losses (Measurement and Prediction). Erosion and control methods: Agronomic and mechanical control, Gully erosion control and wind erosion control. Soil Conservation Planning. Conservation agriculture. Land evaluation, Topographic Survey; Water Resources; Irrigation: Irrigation Agronomy Crop water requirements; irrigation water requirements, Irrigation Engineering: Planning and irrigation project, choosing an irrigation method. Operation and management of Surface irrigation, sprinkler irrigation and Trickle/drip irrigation. Irrigation scheduling. Alternatives to irrigation (water harvesting). Problem soil management and reclamation. Drainage of irrigated land.

G. 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 School of Science. English Communication and Study Skills, English for Academic Purposes, Contemporary Social Issues and Computer Literacy are University Core Modules taken by all First Year University of Namibia students.

G.1 PROGRAMME SCHEDULE

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 1 Semester 1					
UCLC 3509	**Computer Literacy**	**5**	**8**	**C**	
ULCE 3419	**English Communication and Study Skills**	4	16	C	
UCSI 3580	**Contemporary Social Issues**	5	8	C	
SBLG 3511	**Introduction to Biology**	5	16	C	
SPHY 3501	**Physics for Life Sciences I**	5	8	C	
SMAT 3511	**Basic Mathematics**	5	16	C	
Total Credits Semester 1					**72**
Year 1 Semester 2					
ULEA 3519	**English for Academic Purposes**	**5**	**16**	**C**	
SCHM 3532	**Chemistry for Life Sciences**	**5**	**16**	**C**	
SPHY 3532	**Physics for Life Sciences II**	**5**	**16**	**C**	
SBLG 3512	**Diversity of Life**	**5**	**16**	**C**	
SMAT3512	**Pre-calculus**	**5**	**16**	**C**	
Total credits Semester 2					**80**
Total CREDITS YEAR 1					**152**

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 2 Semester 1					
AAEC 3681	**Principles of Microeconomics**	**6**	**12**	**C**	**None**
AAEC 3691	**Rural Sociology**	6	12	C	None
AASC 3681	**Genetics**	6	12	C	None
AFST 3681	**General Microbiology**	6	12	C	None
ACRS 3681	**Biostatistics**	6	12	C	None
AFST 3691	**Post-Harvest Technology**	6	12	C	None
AFST 3601	**Human Nutrition**	6	8	C	None
Total Credits Semester 1					**80**
Year 2 Semester 2					
AFST 3682	**Fruits and Vegetable**	**6**	**12**	**C**	None

	Technology				
AFST 3602	**Food Technology**	**6**	**8**	**C**	None
AASC 3612	**Biochemistry**	**6**	**16**	**C**	SCHM 3532 (Chemistry for Life Sciences)
AASC 3602	**Livestock Production Systems**	**6**	**8**	**C**	None
AFST 3692	**Food Biotechnology**	**6**	**12**	**C**	None
Total credits Semester 2					**56**
Total CREDITS YEAR 2					**136**

Course Code	**Course name**	**NQF Level**	**Credits**	**Compulsory (C) / Elective (E)**	**(Co-requisite) / Pre-requisite**
Year 3 Semester 1					
AACA 3701	**Field Attachment I**	**7**	8	**C**	None
AFST 3781	**Food Chemistry**	7	12	C	ASC 3612 (Biochemistry)
AFST 3791	**Food Microbiology**	7	12	C	FST 3681 (General Microbiology)
AFST 3701	**Product Development and Sensory Evaluation**	7	8	C	None
AFSC 3791	**Food Processing Technology**	7	12	C	AFST 3602 (Food Technology)
AFSC 3781	**Meat Science & Technology**	7	12	C	None
Total Credits Semester 1					**64**
Year 3 Semester 2					
ACSC 3792	**Research Methods**	**7**	**12**	**C**	ACRS3681 (Biostatistics)
AFST 3702	**Food Toxicology**	**7**	**8**	**C**	FST 3781 Food Chemistry
AFST 3722	**Food Analysis and Instrumentation**	**7**	**8**	**C**	None
AAEC 3702	**Entrepreneurship**	**7**	**8**	**C**	None
AFSC 3782	**Principles of Food Engineering**	**7**	**12**	**C**	None
AAEC 3782	**Agricultural Marketing**	**7**	**12**	**C**	None
Total credits Semester 2					**60**
Total CREDITS YEAR 3					**124**

Course Code	**Course name**	**NQF Level**	**Credits**	**Compulsory (C) / Elective (E)**	**(Co-requisite) / Pre-requisite**
Year 4 Semester 1					
AACA 3801	**Field Attachment II**	8	8	**C**	AACA 3708 (Field Attachment I)
AFST 3810	**Research Project**	8	16	C	ACSC 3792 (Research Methods)
AFST 3841	**Quality Management Systems**	8	8	C	FST 3602 (Food Technology)
AFST 3881	**Dairy Science & Technology**	8	12	C	FSC 3791 (Food Processing Technology)

AFST 3891	**Applied Food Engineering**	8	12	C	FSC 3782 Principles of Food Engineering
AFST 3861	**Food Packaging, Storage & Distribution**	8	8	C	None
Total Credits Semester 1					**64**
Year 4 Semester 2					
AFST 3810	**Research Project**	**8**	**16**	**C**	ACSC 3792 (Research Methods)
AFST 3862	**Sea Foods Technology**	**8**	**8**	**C**	FST 3602 (Food Technology)
AFST 3882	**Cereal Science & Technology**	**8**	**12**	**C**	None
AFSC 3802	**Edible Fats & Oils Technology**	**8**	**8**	**C**	FST 3781 (Food Chemistry)
AAEA 3882	**Agric. Business Management**	**8**	**12**	**C**	None
AFST 3822	**Plant Equipment & Management**	**8**	**8**	**C**	FSC 3791 (Food Processing Technology)
Total credits Semester 2					**64**
Total CREDITS YEAR 4					**128**
TOTAL CREDITS FOR THE PROGRAMME					**540**

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

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

Module 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	SBLG3511
NQF Level	4
Contact hours	4 lectures/ week for 14 weeks and one 3-hour practical session per week.
NQF 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.
Prerequisite	NSCC (Biology C or better)
Compulsory/Elective	Compulsory
Semester Offered	1

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

SPHY 3501: PHYSICS FOR LIFE SCIENCES I

Module title:	PHYSICS FOR LIFE SCIENCES I
Code:	SPHY3501
NQF level:	4
NPSC:	N/A
Contact hours:	28 Lectures and 14 Practical Sessions/Tutorials

Credits: 8
Module assessment: Continuous Assessment (50%) and 1 x 3-hour Exam Paper (50%). Continuous Assessment will consist of class tests, tutorial tests/assignments and practical reports.
Pre-requisites: None

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

SMAT 3511: BASIC MATHEMATICS

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

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

LEA3519 ENGLISH FOR ACADEMIC PURPOSES

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

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

SCHM 3532: CHEMISTRY FOR LIFE SCIENCES

Module Title: CHEMISTRY FOR LIFE SCIENCES
Code: SCHM3532
NQF Level: 5
Contact Hours: 56 hours of lectures, 42 hours of practical sessions.
Credits: 16
Module Assessment: CA: 50% (minimum 3 tests 80%, laboratory component 20%, tutorial assignments 10%). Final Exam: 50%; (1 x 3 hour exam paper)

Pre-requisites: None

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

SPHY 3532: PHYSICS FOR LIFE SCIENCES II

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

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

SBLG3512: DIVERSITY OF LIFE

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

Module Content:
This module is designed to give students a detailed understanding of the diversity of life. It gives students the broader appreciation of biodiversity in the different ecological habitats. The course shall describe diagnostic characteristics of principle taxonomic categories for each phylum. Coverage of each Phylum shall follow a phylogenetic (evolutionary) approach as well as introduce broad ecological and physiological principles. Various aspects of reproduction and development shall be highlighted. This module prepares students to understand subsequent courses such as Introduction to Ecology and Microbiology, Population Ecology, Comparative physiology, Biogeography, Plant and Animal Form and Function
Topics covered will include viral, bacterial, fungal, algal, animal and plant diversity. It then considers the characteristics and life cycles of the following important algae, animal and plant groups: Chlorophyta, Phaeophyta, Rhodophyta, Chrysophyta,

Euglenophyta, Pyrrophyta, Cryptophyta, Protostomate phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostomate phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chodrichthyes, Actinopterygii, Actinistia, Dipnoi, Amphibia, Reptilia, Aves, Mammalia) bryophytes, seedless vascular plants, gymnosperms, and the angiosperms. Concepts such as Homology and analogy; body symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered.
Examples from Namibia shall be used where possible and applicable. The course content shall be supplemented with appropriate weekly practical sessions in the laboratory and in the field.

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

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
Module 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

AFST3691: POST HARVEST TECHNOLOGY

Module Title:	POST HARVEST TECHNOLOGY
Code	AFST3691
NQF Level	6
NQF Credits	12
Contact hours	Three Lecture hours / week for 14 weeks; 03Practical hours / week for alternating weeks. Duration of 14 weeks.
Assessment strategies:	Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Exam: 60% (1 x 3 hr paper).
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course includes issues such as postharvest losses; physiological and biochemical characteristics of agricultural products with respect to maturation, ripening and storage life; respiration and is factors affecting respiration rates in selected agricultural crops; controlled atmosphere storage (CAS) and modified atmosphere packaging (MAP); postharvest treatments; postharvest handling, drying and storage of selected crops; pest control and fumigation, and other factors influencing quality. This course develops the students understanding of the ethics and practices employed in food processing. In addition, students are given an understanding of food preservation techniques and factors that affect food quality and shelf life.

AFST 3681: GENERAL MICROBIOLOGY

Module Title:	GENERAL MICROBIOLOGY
Code	AFST 3681
NQF Level	6
NQF Credits	12
Contact hours	Three Lecture hours / week for 14 weeks; 03 Practical hours / week for alternating weeks. Duration of 14 weeks.
Assessment Strategies	Continuous Assessment 40% (minimum 2 tests, 2 assignments and 4 practicals). Examination: 60% (1 x 2hr paper)
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content

This course provides students with a general overview of microbiology, their environment, classifications, their morphology, structures and chemical composition. The biology of bacteria, fungi, algae, protozoa and viruses. Effect of antibiotics on microorganisms, important pathogens of plants and animals. The role of microorganisms in nature; in biogeochemical cycles, in general industries, food industries and in the soils. Concept of microbiology with special reference to microscopy, staining procedure, sterilization, aseptic, pure culture techniques and media preparation.

AFST 3601: HUMAN NUTRITION

Module Title:	HUMAN NUTRITION
Code	AFST 3601
NQF Level	6
Contact hours	Two Lecture hours / week for 14 weeks; 03 Practical hours / week for alternating weeks. Duration of 14 weeks.
Assessment Strategies	Continuous Assessment: 40% (2x assignments + 2 tests + at least 5x marked practicals). Exam: 60% (1 x2hr paper)
NQF Credits	8
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

This course gives students an overview of the locally available foods in Namibia and SADC region, basic nutritional aspects, food digestion system and fluctuations of nutrients in the body. Topics include Students anthropometric measurements: Body Mass Index (BMI), Basal Metabolic Rate (BMR) and Physical Activity Level (PAL); nutritional disorders resulting from deficiencies and excesses e.g. Blindness, Marasmus, Kwashiorkor and Obesity and other macronutrient deficiencies such as Rickets and Anaemia. Balanced ration for each group of people. Students will acquire knowledge in the areas of preservation of nutrients, processing, packaging, GMPs & HACCP, food laws, food toxicology, intolerances and allergies. The role of nutrition with respect to HIV/AIDS will be covered.

AFST 3682: FRUITS AND VEGETABLES TECHNOLOGY

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.
Assessment strategies:	Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper)
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).

AFST 3602: FOOD TECHNOLOGY

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.
Assessment strategies	Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Exam: 60% (1 x 2hr paper)
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.

AFST 3692: FOOD BIOTECHNOLOGY

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.
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 3 hour paper)
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

The course includes topics such as Food biotechnology, an overview; importance, advances, trends and implications. Genetic engineering techniques; restriction enzymes, DNA cloning-cell transformation and transfection, Enzyme engineering and immobilization techniques. Downstream processing, Fermentations. Scale up operations. Biosafety risk assessment and risk management.

G.2.3 THIRD YEAR MODULES

AACA3701: FIELD ATTACHMENT 1

Module Title:	FIELD ATTACHMENT 1
Code	AACA3701
NQF level	7
NQF credits	8
Contact hours	
Assessment strategies:	Final assessment 100% (Attachment report and oral presentation).
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.

AFST 3781: FOOD CHEMISTRY

Module Title:	FOOD CHEMISTRY
Code	AFST 3781
NQF Level	7
NQF Credits	12
Contact hours	Three hours of lectures per week, three hours practicals every two week. Duration of 14 weeks.
Assessment strategies:	Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Exam: 60% (1 x 2hr paper)
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.

AFST 3791: FOOD MICROBIOLOGY

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
Assessment strategies:	Continuous Assessment: 40% (minimum 2 tests, 1 assignment and 3 practicals). Exam: 60% (1 x 2hr paper)
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.

AFST 3701: PRODUCT DEVELOPMENT AND SENSORY EVALUATION

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.
Assessment strategies:	Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper)
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.

AFST 3791: FOOD PROCESSING TECHNOLOGY

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.
Assessment Strategies:	Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination60% (1 x 2 hour paper)
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.

AFSC 3781: MEAT SCIENCE AND TECHNOLOGY

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
Assessment strategies:	Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper)
Prerequisite	AFST 3602: Food Technology
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course is intended to provide students with knowledge on meat industry in Namibia and the SADC region. Structure and composition of meat. Meat proteins and their functionality. Handling of slaughter animals. Slaughtering techniques. Selected topics related to animal anatomy. Grading and pricing of carcasses. Slaughterhouse hygiene. Carcass composition and characteristics and meat quality. Wholesale and retail of meat cuts. Meat processing, equipment and handling: meat packaging, meatstorage, chilling of meat, freezing of meat, smoking of meat, curing of meat, luncheon meats, sausages, sausage casings, meat fermentation. Quality factors and shelf life of processed meat products.

AFST 3702: FOOD TOXICOLOGY

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.
Assessment Strategies:	Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)
Prerequisite	FST 3781 Food Chemistry
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This course includes issues such as types of toxicity, toxicity measurements, biochemical aspects of toxicity, natural toxic constituents of foods, food spoilage and food borne diseases, manifestations of toxic effects and their remedies, food plant sanitation and hygiene, food inspection and legislation in Namibia.

AFST 3722: FOOD ANALYSIS AND INSTRUMENTATION

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.
Assessment strategies:	Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper)
Prerequisite	Food Chemistry AFST 3781
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This course builds on concepts and principles of providing students with skills and dispositions regarding food analysis and instrumentation. Key concepts covered in the module include the scope of food analysis, analytical methods and procedures, assessment and validation of analytical data. The course explores issues on the importance of precision, accuracy, sensitivity, specificity, standard deviation, co-efficient of variation, good laboratory practice and quality assurance, health and safety when conducting food analysis. The module exposes the student to concepts and theories of AOAC, conventional analytical methods; analytical techniques: titrimetry, gravimetry; separation techniques: chromatography, electrophoresis; introduction to analytical spectroscopy: atomic spectroscopy, molecular spectroscopy and radiochemical methods.

AFSC 3782: PRINCIPLES OF FOOD ENGINEERING

Module Title:	PRINCIPLES OF FOOD ENGINEERING
Code	AFSC 3782
NQF Level	7
NQF Credits	12
Contact Hours	Three hours lectures per week for 14 weeks; 03 hours practical alternate week for 14 weeks.
Assessment Strategies:	Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
This course covers: dimensions and units, unit operation calculations, heat and mass balance, heat and mass transfer, heat exchangers, fluid dynamics, rheology, psychrometrics and refrigeration calculations.

G.2.4 FOURTH YEAR MODULES

AFST 3810: RESEARCH PROJECT

Module Title:	RESEARCH PROJECT
Code	AFST 3810
NQF Level	8
NQF Credits	16
Contact Hours	Equivalent to 1 hour per week for 14 weeks.
Assessment Strategies:	Oral Presentations 20% (10% x 2 presentations) Project Write-up80%
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.

AACA 3801: FIELD ATTACHMENT II

Module Title:	FIELD ATTACHMENT II
Code	AACA 3801
NQF Level	8
NQF Credits	6
Contact hours	None
Assessment strategies:	Final assessment 100% (Attachment report, oral presentations, and confidential reports by field supervisors).
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.

AFST 3841: QUALITY MANAGEMENT SYSTEMS

Module Title:	QUALITY MANAGEMENT SYSTEMS
Code	AFST 3841
NQF Level	8
NQF Credits	8
Contact hours	Two lectures per week for 14 weeks
Assessment Strategies:	Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)
Prerequisite	AFST 3602: Food Technology
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
This course is intended to provide students with knowledge on the basic principles of quality management; Good Manufacturing Practices (GMPs); Food Safety; Food Hygiene and Sanitation; Food laws and regulations; Codex Alimentarius; Hazard Analysis Critical Control Point (HACCP); ISO 9001:2000, ISO 22000, ISO/IEC 17025, ISO 14 001; World Organization for Animal Health (OIE) and World Organization for Plant Health. Cleaner productions and food risk assessment and/or analysis.

AFST 3881: DAIRY SCIENCE AND TECHNOLOGY

Module Title:	DAIRY SCIENCE AND TECHNOLOGY
Code	AFST 3881
NQF Level	8
NQF Credits	12
Contact hours	Three lectures per week for 14 weeks; 03 hours Practical every alternate week for 14 weeks.
Assessment strategies:	Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper).
Prerequisite	Food Processing Technology (AFSC 3791); Food Microbiology (AFST 3791)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Students acquaint themselves with the knowledge of udder anatomy, milk synthesis, secretion, milk let down assisted by hormones (oxytocin and adrenalin), clean production, collection, transportation, preservation and quality assessment (chemical, physical and microbiological). They also learn how to process milk into various products, handling, packaging, storage, quality assurance and distribution of pasteurized milks (toned, recombined and reconstituted milks), cream, butter, fermented milk products, cheeses, ice cream, condensed/evaporated milk and milk powders. Marketing aspects of milk and dairy products are included.

AFST 3891: APPLIED FOOD ENGINEERING

Module Title:	APPLIED FOOD ENGINEERING
Code	AFST 3891
NQF Level	8
NQF Credits	12
Contact hours	Three lectures per week for 14 weeks; 03 hour Practical every alternate week for 14 weeks.
Assessment Strategies:	Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

This course includes: Applied aspects of process and auxiliary equipment selection and operation of equipment for heating, cooling, pressure and vacuum development and fluid transport. Basic aspects of process control are also covered as well as advanced preservation technologies. Emerging Food Engineering technologies are discussed as well as their implication on future food processing. Aspects of computer modeling in food technology are covered.

AFST 3861: FOOD PACKAGING, STORAGE AND DISTRIBUTION

Module Title:	FOOD PACKAGING, STORAGE AND DISTRIBUTION
Code	AFST 3861
NQF Level	8
NQF Credits	8
Contact hours	Two lectures per week for 14 weeks; 03 hours Practical for 3 hours every alternate week for 14 weeks.
Assessment strategies	Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practical). Examination: 60% (1 x 2hr paper).
Prerequisite	AFST 3602 Food Technology; AFST 3791 Post Harvest Technology
Compulsory/Elective	Compulsory
Semester Offered	1

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.

AFST 3862: SEA FOODS TECHNOLOGY

Module Title:	SEA FOODS TECHNOLOGY
Code	AFST 3862
NQF Level	8
NQF Credits	8
Contact hours	Two lectures per week for 14 weeks; 03 hours Practical for every alternate week for 14 weeks.
Assessment strategies:	Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2hr paper)
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.

AFST 3882: CEREAL SCIENCE AND TECHNOLOGY

Module Title:	CEREAL SCIENCE AND TECHNOLOGY
Code	AFST 3882
NQF Level	8
NQF Credits	12
Contact hours	Three lectures per week for 14 weeks; 03 hours Practical for every alternate week for 14 weeks.
Assessment strategies	Continuous Assessment: 40% (minimum 2 tests, 2 assignments and 5 x marked practicals). Examination: 60% (1 x 2 hr paper).
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.

AFSC 3802: EDIBLE FATS AND OILS TECHNOLOGY

Module Title:	EDIBLE FATS AND OILS TECHNOLOGY
Code	AFSC 3802
NQF Level	8
NQF Credits	8
Contact hours	Three lectures per week for 14 weeks; 03 hours Practical for every alternate week for 14 weeks.
Assessment Strategies	Continuous assessment 40% (minimum 2 tests, 1 assignment and 4 marked practicals) Examination 60% (1 x 2 hour paper)
Prerequisite	AFST 3781: Food Chemistry
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

The module includes a comprehensive Lipid chemistry review including the structure of common chemical reactions and simple physical properties. The module exposes the student to concepts and theories of seed decortications and simple decorticators, graters, pulverisers, heaters, roasters, expellers and presses. The issues relating to establishing a small scale and commercial extraction of fats and oils, Oil refinery, Oil storage and packaging will be covered. The module also focuses on the importance of Shelf life, Side reactions during processing and food preparation. The module introduces students to Oil products e.g. cooking oil, margarine, lard, butter and salad oils. Product utilization and quality control is explored in this module.

FST 3822: PLANT EQUIPMENT AND MANAGEMENT

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

H. 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 School 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.I PROGRAMME SCHEDULE

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 1 Semester 1					
UCLC 3509	**Computer Literacy**	**5**	**8**	**C**	
ULCE 3419	**English Communication and Study Skills**	4	16	C	
UCSI 3580	**Contemporary Social Issues**	5	8	C	
SBLG 3511	**Introduction to Biology**	5	16	C	
SPHY 3501	**Physics for Life Sciences I**	5	8	C	
SMAT 3511	**Basic Mathematics**	5	16	C	
Total Credits Semester 1					**72**
Year 1 Semester 2					
ULEA 3519	**English for Academic Purposes**	**5**	**16**	**C**	
SCHM 3532	**Chemistry for Life Sciences**	**5**	**16**	**C**	
SBLG 3512	**Diversity of Life**	**5**	**16**	**C**	
SMAT3512	**Pre-calculus**	**5**	**16**	**C**	
Total credits Semester 2					**64**
Total CREDITS YEAR 1					**136**

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 2 Semester 1					
AAEC 3681	**Principles of Microeconomics**	**6**	12	**C**	**None**
AAEC 3691	**Rural Sociology**	6	12	C	None
AASC 3681	**Genetics**	6	12	C	None
AFST 3681	**General Microbiology**	6	12	C	None
ACRS 3681	**Biostatistics**	6	12	C	None
AFAS 3691	**Aquatic Ecology**	6	12	C	None
Total Credits Semester 1					**72**
Year 2 Semester 2					
AAEC 3682	**Production Economics**	**6**	**12**	**C**	None
AFAS 3682	**Introduction to Aquaculture**	**6**	**12**	**C**	None
AFAS 3601	**Ichthyology I**	**6**	**8**	**C**	None
AASC 3612	**Biochemistry**	**6**	**16**	**C**	SCHM 3532 (Chemistry for Life Sciences)

AFAS 3692	**Aquatic Chemistry**	**6**	**12**	**C**	None
AFAN 3682	**Natural Resource Economics**	**6**	**12**	**C**	None
Total credits Semester 2					**72**
Total CREDITS YEAR 2					**144**

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 3 Semester 1					
AACA 3701	**Field Attachment I**	**7**	8	**C**	None
AFAP 3781	**Physical Oceanography**	7	12	C	None
AFAS 3781	**Aquaculture and Fisheries products**	7	12	C	None
AFAF 3781	**Ichthyology II**	7	12	C	AFAS 3682: Introduction to Aquaculture and AFAS 3602: Ichthyology I
AFAS 3791	**Fisheries Management I**	7	12	C	None
AAEC 3781	**Farm Planning and Management**	7	12	C	None
Total Credits Semester 1					**68**
Year 3 Semester 2					
ACSC 3792	**Research Methods**	**7**	**12**	**C**	ACRS3681 (Biostatistics)
AFAS 3782	**Basic Aquaculture Engineering**	**7**	**12**	**C**	AFAS 3682: Intro to Aquaculture, AFAS3692: Aquatic Chemistry, AFAS3691: Aquatic Ecology and AFAS 3602: Ichthyology I
AFAS 3792	**Fisheries Management II**	**7**	**12**	**C**	None
AFAS 3712	**Integrated Coastal Zone Management**	**7**	**16**	**C**	AFAS 3691: Aquatic Ecology
AFAA 3782	**Aquaculture Nutrition and Feed Manufacturing**	**7**	**12**	**C**	None
Total credits Semester 2					**64**
Total CREDITS YEAR 3					**132**

Course Code	Course name	NQF Level	Credits	Compulsory (C) / Elective (E)	(Co-requisite) / Pre-requisite
Year 4 Semester 1					
AACA 3801	**Field Attachment II**	8	8	**C**	AACA 3708 (Field Attachment I)
AFAS 3810	**Research Project**	8	16	C	ACSC 3792 (Research Methods)
AFAS 3812	**Fish Population Dynamics**	8	16	C	ACSC 3792: Research Methods
AFAS 3832	**Aquaculture Management**	8	16	C	AFAS: 3682: Introduction to Aquaculture, AFAS 3782 : Basic Aquaculture Engineering and AFAA 3782: Aquaculture

					Nutrition and Feed Manufacturing
AFAS 3831	**Fish Pathology**	8	16	C	AFST 3681 General Microbiology and AFAS 3682: Introduction to Aquaculture
AFAS 3891	**Fisheries Economics**	8	12	C	AFAN 3682: Natural Resource Economics
Total Credits Semester 1					**84**
Year 4 Semester 2					
AFAS 3810	**Research Project**	**8**	**16**	**C**	ACSC 3792 (Research Methods)
AFAS 3811	**Biological Oceanography**	**8**	**16**	**C**	AFAS 3781 Physical Oceanography, and FAS 3692 Aquatic Chemistry
AENE 3882	**Environmental Impact Assessment**	**8**	**12**	**C**	AFAS 3712: Integrated Coastal Zone Management
Total credits Semester 2					**44**
Total CREDITS YEAR 4					**128**
TOTAL CREDITS FOR THE PROGRAMME					**540**

H.2. MODULE DESCRIPTORS

H.2.1 FIRST YEAR MODULES

CLC3509 COMPUTER LITERACY

Module title: COMPUTER LITERACY
Code: CLC3509
NQF level: 5
Contact hours: 1 lecture theory and 1 lecture practical per week for 14 weeks
Credits: 8
Module assessment: Continuous Assessment 100%: 2 Practical Tests 50%, 2 Theory Tests 50%
Prerequisites: University Entry
Module Content:
The module covers the following topics. Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals. Working with the windows operating system: File Management, working with multiple programs, using the recycle bin. Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge. Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the workbook. Databases: creating tables, relationships, queries, forms and reports. Presentation software: slide layout and master, animations, auto-content wizard and templates. Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

LCE3419 ENGLISH COMMUNICATION & STUDY SKILLS

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

Module Content:
This module is aimed at assisting students in the development of their reading, writing and speaking and listening skills, in order to cope with studying in a new academic environment and in a language which may not be their first language. The module also

focuses on study skills that students need throughout their academic careers and beyond. The module serves as an introduction to university level academics, where styles of teaching and learning differ from those at secondary schools in that more responsibility is placed on the student. The module therefore, focuses on the skills that students need throughout their academic careers and beyond.

CSI 3580 CONTEMPORARY SOCIAL ISSUES

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

Module 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	SBLG3511
NQF Level	4
Contact hours	4 lectures/ week for 14 weeks and one 3-hour practical session per week.
NQF 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.
Prerequisite	NSCC (Biology C or better)
Compulsory/Elective	Compulsory
Semester Offered	1

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

SPHY 3501: PHYSICS FOR LIFE SCIENCES I

Module title:	PHYSICS FOR LIFE SCIENCES I
Code:	SPHY3501
NQF level:	4
NPSC:	N/A
Contact hours:	28 Lectures and 14 Practical Sessions/Tutorials
Credits:	8
Module assessment:	Continuous Assessment (50%) and 1 x 3-hour Exam Paper (50%). Continuous Assessment will

consist of class tests, tutorial tests/assignments and practical reports.

Pre-requisites: None

Module Content:

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

SMAT 3511: BASIC MATHEMATICS

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

Module Content:

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

LEA3519 ENGLISH FOR ACADEMIC PURPOSES

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

Module Content:

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

SCHM 3532: CHEMISTRY FOR LIFE SCIENCES

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

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

SBLG3512: DIVERSITY OF LIFE

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

Module Content:
This module is designed to give students a detailed understanding of the diversity of life. It gives students the broader appreciation of biodiversity in the different ecological habitats. The course shall describe diagnostic characteristics of principle taxonomic categories for each phylum. Coverage of each Phylum shall follow a phylogenetic (evolutionary) approach as well as introduce broad ecological and physiological principles. Various aspects of reproduction and development shall be highlighted. This module prepares students to understand subsequent courses such as Introduction to Ecology and Microbiology, Population Ecology, Comparative physiology, Biogeography, Plant and Animal Form and Function
Topics covered will include viral, bacterial, fungal, algal, animal and plant diversity. It then considers the characteristics and life cycles of the following important algae, animal and plant groups: Chlorophyta, Phaeophyta, Rhodophyta, Chrysophyta, Euglenophyta, Pyrrophyta, Cryptophyta, Protostomate phyla: Nemertea, Mollusca, Anellida, Arthropoda, Nematoda, Rotifera, Lophophorates, Onychophora. Deuterostomate phyla: Echinodermata, Hemichordata and Chordata (Subphyla: Urochordata, Cephalochordata and Vertebrata: Class Myxiniformes, Petromyzontiformes, Placoderms, Chodrichthyes, Actinopterygii, Actinistia, Dipnoi, Amphibia, Reptilia, Aves, Mammalia) bryophytes, seedless vascular plants, gymnosperms, and the angiosperms. Concepts such as Homology and analogy; body symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered.
Examples from Namibia shall be used where possible and applicable. The course content shall be supplemented with appropriate weekly practical sessions in the laboratory and in the field.

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

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
Module Assessment:	Continuous assessment 50% (at least 3 tests), examination 50% (3 hours examination paper).
Prerequisite:	NSSC Mathematics

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

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

H.2.2 SECOND YEAR MODULE

AAEC 3681: PRINCIPLES OF MICROECONOMICS

Module title:	PRINCIPLES OF MICROECONOMICS
Code:	AAEC 3681
NQF level:	6
Contact hours	Lectures: 3x 1hr L/wk for 14 weeks (42hrs)
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)
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.

AAEC 3691: RURAL SOCIOLOGY

Module Title:	RURAL SOCIOLOGY
Code	AAEC 3691
NQF level	6
Contact hours	Lectures: 3x 1hr L/wk for 14 weeks (42hrs)
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hour paper)
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.

AAEC 3682: PRODUCTION ECONOMICS

Module Title:	PRODUCTION ECONOMICS
Code	AAEC 3682
NQF Level	6
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs)
Assessment Strategies	Continuous assessment 40% (minimum 2 tests and 1 assignment) Examination 60% (1 x 2 hr paper)
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.

AFST 3681: GENERAL MICROBIOLOGY

Module Title:	GENERAL MICROBIOLOGY
Course Code	AFST 3681
NQF Level	6
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
Assessment Strategies	Continuous Assessment 40% (minimum 2 tests, 2 assignments and 4 practicals). Examination: 60% (1 x 2 hr paper)
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.

AASC 3681: GENETICS

Module Title:	GENETICS
Code	AASC 3681
NQF Level	6
Contact hours	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
Assessment Strategies	Continuous Assessment: 40% (2 assignments, 2 tests and at least 5 marked practicals). Examination: 60% (1 x2 hr paper).
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.

AASC 3612: BIOCHEMISTRY

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
Assessment Strategies	Continuous Assessment: 40% (minimum 2 assignments, 2 tests and at least 5 marked practicals). Examination: 60% (1 x3 hr paper)

NQF Credits	16
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

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

AFAS 3691: AQUATIC ECOLOGY

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)
Assessment Strategies	Continuous Assessment: 40% (minimum 2 assignments, 2 tests and at least 5x marked practicals). Examination: 60% (1 x2 hr paper)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Abiotic parameters influencing productivity of aquatic systems. Diversity, structure and functioning of the various community structures: phytoplankton, zooplankton and benthos; direct and interact interactions between the biotic and abiotic components of the aquatic systems. Functional webs. Influence of competition. Predation and symbiosis and commensalisms on community structure. Reproduction tactics, growth, survival and fecundity of producers and consumers.

AFAS 3682: INTRODUCTION TO AQUACULTURE

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)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, 1 marked assignment and 3 practicals); Examination: 60% (1 x 2 hr paper)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module content
History of aquaculture. Types of aquaculture systems and global aquaculture production statistics. Culturable aquaculture species. Site selection for aquaculture practices. Impact of aquaculture systems on the environment and regulations governing aquaculture practices. Environmental factors affecting aquaculture productivity: water quality, soil types, aquatic macrophytes. Pond designs and stocking. Introduction to aquaculture nutrition and feed formulations. Aquaculture diseases and management. Broodstock management and larval rearing. Aquaculture development in Namibia.

AFAS 3601: ICHTHYOLOGY I

Module Title:	ICHTHYOLOGY I
Code	AFAS 3601

NQF Level	6
Contact hours	Lectures: 2 x 1hr/wk for 14 weeks (28hrs); Practical's: 1 x 2hr alternate for 14 weeks (14hrs)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests and 3 marked assignments); Examination: 60% (1 x 2 hr paper)
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.

AFAS 3692: AQUATIC CHEMISTRY

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)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper).
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:

Introduction to water chemical structure. Chemical composition of water bodies. Chemical and physical parameters: pH, salinity, alkalinity and carbon dioxide; total alkalinity and hardness; acidity; dissolved gasses and interaction with atmosphere; decomposition of organic matter; Nutrients and nutrient cycles: phosphorus, nitrogen, sulphur, iron and manganese; silicon and other micro-nutrient constituents. Physical – chemical interactions in oceanic and estuarine environment; Marine system pollution scenario. Irradiance/UVR and heat flux. Instrumentation and methods of measurement of water quality parameters.

ACRSC 3681: BIOSTATISTICS

Module Title:	BIOSTATISTICS
Code	ACRSC 3681
NQF Level	6
Contact hours	3 lecture hours / week for 14 weeks; 3 tutorial / practical hours alternate weeks for 14
Assessment Strategies	Continuous assessment (40%): at least three assessments; Examination (60%): 1 x 2 hr paper
NQF Credits	12
Prerequisite	SMAT 3511 Basic Mathematics
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content

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

AFAN 3682: NATURAL RESOURCE ECONOMICS

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)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests and 3 marked assignments); Examination: 60% (1 x 2 hr paper)
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.

H.2.3 THIRD YEAR MODULES

AFAP 3781: PHYSICAL OCEANOGRAPHY

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)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, 1 assignment and 3 practicals); Examination: 60% (1 x 2 hr paper)
NQF Credits	12
Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:

Physical properties of sea water; What drives oceans? Global temperature and salinity distribution. Coastal processes: accumulation, fresh water runoff, sediment transport. Tides and tidal mechanisms. Eddy diffusion and turbulence. Waves and Tsunamis. Coriolis and Ekman transport. Statics (sea at rest) and Dynamics (wind driven and geostrophical currents, vertical water movement, rings and meanders). The Benguela Current system. Environmental conditions and the Fisheries. Physical and oceanographic instrumentation.

AFAS 3781: AQUACULTURE AND FISHERIES PRODUCTS

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)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 practicals); Examination: 60% (1 x 2 hr paper)
NQF Credits	12
Prerequisite	AFAS 3682: Introduction to Aquaculture
Compulsory/Elective	Compulsory
Semester Offered	1

Module content

Aquaculture and Fisheries Products; Fish from farm/sea to the table; storage and slaughter techniques; Harvesting techniques; Processing technologies and preservation methods i.e. smoking, freezing, canning and drying; Transport and logistics; Packaging ; Nutritional composition; Product Development and value addition; Product Quality and Marketing; Food safety and health ; Quality evaluation; Quality Management Systems.

AFAF 3781: ICHTHYOLOGY II

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)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper
NQF Credits	12
Prerequisite	AFAS 3682: Introduction to Aquaculture
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Introduction to fish biology and internal anatomy. Respiration: structure and function of gills, mechanism of gaseous exchange, adaptation for air breathing in lungfishes. Digestive: structure and functions of alimentary canal, food and feeding habits. Excretion: structure and functions of excretory organs, osmoregulation and thermoregulation. Skeleton, muscle and swimming mechanism. Reproduction: structure and functions of gonads, gamete formation and reproductive strategies. Fish endocrinology and hormonal control. Introduction to fish genetics.

ACA 3701: FIELD ATTACHMENT I

Module Title:	FIELD ATTACHMENT I
Code	ACA 3701
NQF Level	7
Contact hours	Six weeks of Field Attachment
Assessment Strategies	40 % report presentation at a seminar; 60 % Field report. Subject to satisfactory attendance and good conduct during 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.

AAEC 3781: FARM PLANNING AND MANAGEMENT

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)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper)
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.

AFAS 3791: FISHERIES MANAGEMENT I

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)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper)
NQF Credits	12
Prerequisite	None

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)

AFAS 3792: FISHERIES MANAGEMENT II

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)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper)
NQF Credits	12
Prerequisite	None
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.

AFAS 3712: INTEGRATED COASTAL ZONE MANAGEMENT

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
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper).
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.

AFAS 3782: BASIC AQUACULTURE ENGINEERING

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)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper).
NQF Credits	12
Prerequisite	AFAS 3682: Introduction to Aquaculture, AFAS 3692: Aquatic Chemistry, AFAS 3691: Aquatic Ecology, AFAS 3602: Ichthyology I
Compulsory/Elective	Compulsory

Semester Offered 1

Module Content
Principles of site selection. Water transport: pipes and pipe parts, types of pumps. Water quality and water treatment. Heating and Cooling. Aeration and oxygenation. Aquaculture recirculating systems. Pond, cage tanks and raceway systems, their construction principles and layout. Fish transportation and size grading systems. Instrumentation and automation in aquaculture.

ACSC 3792: RESEARCH METHODS

Module Title:	RESEARCH METHODS
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)
Assessment Strategies	Continuous Assessment: 40 % (minimum of 2 tests, 1 assignment, 7 practicals). Examination: 60% (1 x 2 hr paper)
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

AFAA 3782: AQUACULTURE NUTRITION AND FEED MANUFACTURING

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)
Assessment Strategies	Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper).
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.

H.2.4 FOURTH YEAR MODULES

AFAS 3810: RESEARCH PROJECT

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.

AACA 3801: FIELD ATTACHMENT II

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)

AFAS 3891: FISHERIES ECONOMICS

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
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Role of economics in fisheries management. Production technology and efficiency. Catch and cost structure.
Producer's surplus and resource rent. Profitability and efficiency parameters. Marketing functions and consumption.
Maximum sustainable yield (MSY) versus maximum economic yield (MEY) Welfare economics.
Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper).

FAS 3831: FISH PATHOLOGY

Module Title:	FISH PATHOLOGY
Code	FAS 3831
NQF Level	8
Contact hours	Lectures: 4 x 1hr/wk for 14 weeks (56rs); Practical's: 1 x 3hr/wk for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	SFST 3681: General Microbiology, AFAS 3682: Introduction to Aquaculture
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
General basic pathology and fish immune/defense system. General and basic parasitology, parasite specificity and parasite development cycle. Infectious diseases: viral, bacterial and fungal diseases. Invasive diseases: protozoan infection, mixosporidian infection, crustacean parasites, platyhelminthes infection of fish. Non- infectious diseases. Diseases of unknown etiology. Basic histopathology. Fish disease diagnosis, treatment and prophylaxis.. Biosecurity and animal welfare.
Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 10 marked practicals); Examination: 60% (1 x 3 hr paper).

AENE 3882: ENVIRONMENTAL IMPACT ASSESSMENT

Module Title:	ENVIRONMENTAL IMPACT ASSESSMENT
Code	AENE 3882
NQF Level	8
Contact hours:	Lectures: 3x 1hr/wk for 14 weeks (42hrs); Practical's: 1 x 3hr alternate wk for 14 weeks (21hrs)
NQF Credits	12
Prerequisite	AFAS 3712: Integrated Coastal Zone Management
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Definitions: impact assessment, Environmental studies, Environmental Impacts of Human Activities on Natural Resources; impact on atmosphere, impact on water bodies, impact on wildlife, impact on forests; Environmental considerations in Physical planning. Impact identification, monitoring and mitigation; methods of identifying impacts, methods of monitoring environmental impacts, types of mitigation actions. Formal Environmental Impact Assessment: Origins and significance of formalized approach; historical context and rationale; major issues in formal EIA process; procedure of formal EIA process, common methodologies and examples o their application, Choosing an appropriate methodology. Policy and Framework in Namibia: monitoring and quality control, role of Departmental Affairs; EIA in Namibia.
Assessment strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 5 marked practicals); Examination: 60% (1 x 2 hr paper).

FAS 3811: BIOLOGICAL OCEANOGRAPHY

Module Title:	BIOLOGICAL OCEANOGRAPHY
Code	FAS 3811
NQF Level	8
Contact hours:	Lectures: 4x 1hr/wk for 14 weeks (56hrs); Practical's: 1 x 3hr/wk for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	AFAP 3781: Physical Oceanography, AFAS 3692: Aquatic Chemistry
Compulsory/Elective	Compulsory
Semester Offered	1

Module Content:
Abiotic factors: Properties of sea water and sediment – sea water reactions. Dissolved nutrients, nutrient cycling and chemical – biological interactions. Biotic factors: Inhabitants of the pelagic biota (bacteria, algae, zooplankton, fish). Primary production, - regulation and regional aspects. Energy transfer and food chain processes. Pelagic – benthic interactions. Microbiology of oceans. Types of biotopes: polar, temperate and tropical systems. Marine system carrying capacity. Sampling gear and methods of species biomass assessment. Marine remote sensing. Oceanographic instrumentation and methods of measurement.
Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 10 marked practicals); Examination: 60% (1 x 3 hr paper).

AFAS 3812: FISH POPULATION DYNAMICS

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).

AFAS 3832: AQUACULTURE MANAGEMENT

Module Title:	AQUACULTURE MANAGEMENT
Code	AFAS 3832
NQF Level	8
Contact hours:	Lectures: 4x 1hr/wk for 14 weeks (56hrs); Practical's: 1 x 3hr/wk for 14 weeks (42hrs)
NQF Credits	16
Prerequisite	AFAS 3682: Introduction to Aquaculture, AFAS 3792: Basic Aquaculture Engineering, AFAS 3781: Aquaculture Nutrition and Feed Manufacturing
Compulsory/Elective	Compulsory
Semester Offered	2

Module Content:
Broodstock, hatchery, water quality management. Live feed production. Selection breeding. Broodstock conditioning. Hygiene requirements on the farm. Bio-security. General Human Resources. Financial projections of aquaculture enterprises.

Assessment Strategies
Continuous Assessment: 40% (minimum of 2 tests, a marked assignment and 10 marked practicals); Examination: 60% (1 x 3 hr paper).

The School of Agriculture and Fisheries Sciences may award the following postgraduate qualifications:

Qualification Code	Qualification Name	Study Period
17MSAG	Master of Science in Agriculture (By Thesis only)	2
17MSRR	Master of Science (Rangeland and Resources Management)	2
17MSFA	Master of Science in Fisheries and Aquatic Sciences (By Thesis only)	2
17MSWM	Master of Science in Wildlife Management & Ecotourism (By Thesis only)	2
17DPAG	Doctor of Philosophy in Agriculture	3
17DPFA	Doctor of Philosophy in Fisheries and Aquatic Sciences	3

I.1. ADMISSION REQUIREMENTS

I.1.1.1 The University of Namibia general regulations regarding admission of students to Master's Degree programmes shall apply.

I.1.1.2 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 recognised and accredited institution of higher learning.

I.2. ASSESSMENT

The following were adopted to ensure high standards and competitive degree quality:

I.2.1 A 3-hour theory examination at the end of each course;

I.2.1.1 A pass mark of 60% for all courses, including the thesis;

I.2.1.2 A weighting of 50:50 for continuous assessment (CA) and the final examination;

I.2.1.3 At least 3 different continuous assessments for each course for core courses and 5 for generic courses;

I.2.1.4 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;

I.2.1.5 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.

I.2.1.6 A student can remain registered for a maximum of 4 years.

I.2.1.7 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.

The following will be the structure of the degree.

I.2.2 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.

I.2.2.1 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.

I.2.2.2 Coursework will be covered over two semesters in the first year while research and thesis work will be done in the second year.

I.2.2.3 There will be a maximum of 15 students per intake (minimum 5 students) and new intakes will be done once in two years.

I.2.2.4 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.

I.2.2.5 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.

I.2.2.6 Each core course will run over a 4-week block, while the generic courses will run over 28 weeks, across the two semesters.

I.2.2.7 Six core courses will be taught each semester with a week's break between the core teaching blocks.

I.2.2.8 Core course examinations will be written immediately after the course, during the inter-block break.

I.2.2.9 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.

This will include; lectures, field work, discussion seminars, case studies, group projects etc.

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.

I.1. POSTGRADUATE TRAINING PROGRAMMES AT UNAM

Students who are on full time employment should take studies on a part time basis.

I.1.1. Postgraduate Diploma Programmes

1) UNAM makes provision for Postgraduate Diploma programmes in selected fields as approved by Senate.

2) Postgraduate Diploma programmes offer specialised training, which is career-oriented.

3) Postgraduate Diploma programmes have a minimum of **one year** duration for **full-time** students, and **two years** for **part-time** students; are **taught** programmes (i.e. involve lectures, seminars, practicals, written tests and examinations, etc); and also include a small independent research component.

I.1.2. Master's Degree Programmes

1) Postgraduate training programmes at Master's degree level are of two types:
   (a) Master's degree by research culminating in a thesis.
   (b) Taught Master's degree involving at least one academic year of coursework followed by a mini thesis.

2) Students admitted to Master's degree programmes enrol on either a full time or part time basis. Master's degree programmes have minimum of two years duration for full-time students and three years for part-time students; and **a maximum of three years for full time students and maximum of five years for part-time students,** unless otherwise stipulated by programme specific regulations.

I.1.3. Doctoral Programmes

1) Doctoral programmes at UNAM are normally undertaken by research and the writing of a dissertation unless otherwise approved by Senate. The duration of a doctoral programme is a minimum of three for full-time studies and four years for part-time students; and **a maximum of four years for full time students and maximum of six years for part-time students.**

2) Doctoral study opportunities at UNAM are offered where the departments have the necessary qualifications for admission, where the relevant Department has the necessary research facilities and infrastructure, and where sufficiently qualified and experienced academics are available and ready to provide effective supervision.

I.1.4. Approval of Postgraduate Programmes

All programmes should be considered by the UNAM Postgraduate Studies Committee to ensure that they adhere to the UNAM Postgraduate regulations and standards of quality, before these programmes are recommended by the Academic Planning Committee (APC) to Senate for approval.

I.2. REGULATIONS AND GUIDELINES GOVERNING POSTGRADUATE APPLICATIONS

I.2.1 Eligibility for Admission/ Procedures to Apply for Postgraduate Studies

UNAM welcomes students with a range of qualifications from all over the world. Applicants must fulfil the minimum admission requirements for entry as well as English Language requirement (if relevant) as indicated. Competition for places in some programmes is extremely high, and the minimum requirement given may not be sufficient to be admitted. **Due to this, applicants may be requested to undergo further screening processes.**

I.2.2 Postgraduate Diploma

1) Prospective students must be in possession of a relevant Bachelor's degree from UNAM or any other recognised institution.

2) Students who do not comply with (1) above may also be considered according to the University approved Recognition of Prior Learning (RPL) Policy.

I.2.3 Master's Degree

1) Prospective students must be in possession of a NQF (Namibian National Qualifications Framework) Level 8 Bachelor (honours) degree qualification or equivalent, with an overall grade average of 60% (and above) from UNAM or any other recognised institution, in the chosen field of study.

2) In addition, prospective students must satisfy Faculty specific requirements as indicated in the admission requirements of the relevant programme (e.g. minimum two years teaching experience and a screening test for M.Ed. admission).

I.2.4 Doctor of Philosophy Degree and other Doctoral Programmes

1) Prospective candidates must be in possession of a NQF level 9 Master's degree or equivalent from UNAM or any other recognised institution, in the chosen field of study.

2) Students who enrolled for a Master's degree by thesis only may be considered for upgrading into the Doctoral Programme if, during the second year of registration they demonstrate sufficient original contribution(s) to knowledge as motivated by the supervisors through the Faculty Postgraduate Studies Committee and approved by the UNAM PGSC.

I.3 APPLICATION PROCEDURES FOR POSTGRADUATE STUDIES

I.3.1 Application forms

Applications for postgraduate studies should be made on a University **postgraduate application form** which is available on request from the Office of the Registrar, Student Records Section, and can also be downloaded from the UNAM Webpage: http://www.unam.edu.na

Before completing the application form, applicants must familiarise themselves with all aspects pertaining to postgraduate studies as set out in this prospectus. Applicants must also acquaint themselves with the different modes of the programmes offered (e.g. taught programmes or by thesis/dissertation only, full time or part time). Applicants must ensure that all relevant documentation is submitted with the application form, together with a **non-refundable application fee**. Receipt of the application will be acknowledged by mail.

Prospective students with qualifications obtained from an institution outside Namibia (or non-accredited institutions in Namibia) must submit a Namibia Qualifications Authority (NQA) evaluation for such qualification together with their application forms compulsory. Please Note: this process takes at least 30 days and proof of submission to NQA will NOT be accepted.

All Master's by Thesis and Doctorate by Dissertation must submit a research topic concept note (maximum two pages) together with the application form. No consideration will be given to applications without the concept note.

Incomplete applications will not be considered.

The closing date for taught Master's and taught Doctoral applications is end of **July** of each year or as advertised **(No late applications will be accepted).**

Application for Master's and Doctoral programmes by thesis/dissertation only, will be accepted throughout the year.

I.3.2 Processing of applications

The completed application forms will be processed and forwarded by the Student Records Section to the Centre for Postgraduate Studies which will in turn forward the applications to the relevant Faculty/School/Department Admission Committees.

I.3.3 Admission of students

The Department/School recommends admission through the Faculty to the Centre for Postgraduate Studies taking into account the applicant's fulfilment of the minimum admission requirements, availability of supervisors and space. A provisional admission letter indicating further conditions to be met as applicable will be issued to prospective student.

Master's by Thesis and Doctoral programmes by Dissertation

The relevant Faculty PGSC will recommend Supervisor(s) according to the applicant's area of study to the UNAM PGSC for approval.

Upon approval of the supervisor(s) by the UNAM Postgraduate Studies Committee and verification of other conditions, an admission letter is issued by the Centre.

It is the responsibility of the student to ensure that the supervision agreement (Annex 1) is signed with the supervisor. After verification of this agreement by the Faculty PGS Officer the student may register during the next registration period (first week of the month).

Master's and Doctoral Programmes by coursework

Upon recommendation by the relevant Department/School, the FPGSC will recommend a supervisor(s) according to the applicant's area of study to the UNAM PGSC for approval, at least six months before the start of the research component.

I.3.4 Study Permit Requirements

According to the Immigration Control Act of 19 August 1993, all International students (SADC and Non-SADC) must be in possession of a valid approved Study Permit and Visa before entering Namibia for the purpose of studying. All prospective (first and senior) students are required to apply for a Study Permit and Visa on the prescribed forms obtainable from the University of Namibia or at the Namibian Embassy in any country or the nearest Namibian Embassy or Ministry of Home Affairs and Immigration (Namibia) website.

Only persons with permanent Namibian Residence, Refugees or Asylum Seekers and Diplomatic representatives are exempted from applying for a Study Permit and Visa. The mentioned categories are exempted on condition that they provide the relevant documentation (i.e. Permanent Residence Permit, approved and endorsed Refugee/ Political Asylum Seekers status, a Courtesy Visa which confirms diplomatic status) to the University of Namibia.

Study Permits, Work Permits and Tourist Visas are not interchangeable. Kindly note that candidates in possession of a work permit will need to apply for a study permit if offered provisional admission to the University of Namibia.

The University of Namibia and the Ministry of Home Affairs and Immigration (Namibia) have a temporary arrangement that students may apply for their Study Permits during the duration of the scheduled registration period.

I.4 REGULATIONS AND GUIDELINES GOVERNING REGISTRATION OF ADMITTED STUDENTS

I.4.1 REGISTRATION FOR MASTER'S/DOCTORAL BY THESIS/DISSERTATION ONLY

B.5.1.1 Registration of admitted students

1) All postgraduate students are expected to adhere to the deadline dates for registration as stipulated in the Faculty, Postgraduate and General Regulations Prospectuses.
2) All Postgraduate Students shall be required to register for the **compulsory module on "Academic Writing for Postgraduate Students".**
3) Students who apply for Masters/Doctoral may be required to enrol in selected modules, which will help to bridge any gaps in their earlier training or expose them to new developments in their study disciplines, as may be recommended by relevant FPGSC and approved by the UNAM PGSC. Students must pass these modules before they qualify for graduation.

4) All Postgraduate Students shall be required to register **every year** for the duration of the specific programme, unless approval has been granted for a break in studies.
5) Students who fail to register for any particular academic year will have to apply for re-admission to the programme and provide valid reasons why he/she could not register for the particular academic year.
6) A registered student may be allowed to transfer to the University of Namibia (from another institution) subject to written approval of the supervisor(s) and the relevant Postgraduate Studies governing bodies from both Universities involved. Registration is subject to the availability of suitable supervisors and all relevant processes and regulations of the University of Namibia.
7) A registered student may be allowed to transfer from the University of Namibia subject to written approval of the supervisor(s) and the relevant Postgraduate Studies governing bodies from both Universities involved.
8) No student shall be admitted as a candidate for more than one qualification at the same time without the special permission of Senate. Likewise, no student registered at the University of Namibia shall be permitted to enroll as a student at another university at the same time.
9) Senate may, after consultation with Faculties, restrict the number of candidates who may be permitted to register for a particular course of study, in which case Faculties may, from amongst the candidates qualified to register for such a course of study, select those who will be permitted to register.

I.4.2 REGISTRATION FOR MASTER'S/DOCTORAL PROGRAMMES BY COURSEWORK

Registration of admitted students

1) All postgraduate students are expected to adhere to the deadline dates for registration/addition of modules as stipulated in the Faculty, Postgraduate and General Regulations Prospectuses.

2) Students who are registered in programmes involving coursework and a thesis/dissertation will be required to enrol for **core** and **elective** (optional) modules, as prescribed in the relevant Faculty Prospectus and in the Centre for Postgraduate Studies Prospectus under the relevant Faculty.

3) Before registering for the research component, students must sign an agreement with the approved supervisor (Annexure 1) **not later than six (6) months** before the scheduled start of the research project, as reflected in the curriculum.

I.4.3 Approval of Research Proposal

Within three (3) months of signing the agreement with the approved supervisor the research proposal accompanied by all supporting documents (e.g. informed consent form, interview guide etc) must be presented to the Faculty PGSC. The Faculty PGSC makes one of three recommendations:

Within six (6) months of registration for a Master's and within nine (9) months of registration for a Doctoral programme, the research proposal accompanied by all supporting documents(informed consent form, interview guide etc) must be presented to the Faculty PGSC. The Faculty PGSC makes one of three recommendations:

1. Approves the research proposal and recommends it, as well as the Ethical Clearance Certificate obtained from the CRP, to the UNAM PGSC for noting and issuing of the Research Permission Letter by the Director: Postgraduate Studies;
2. Rejects the research proposal and recommends de-registration of the student to the UNAM PGSC.
3. Grants an extension period of three (3) months for re-submission after which the Faculty PGSC makes one of the following recommendations:

3.1 Approves the research proposal and recommends it, as well as the Ethical Clearance Certificate obtained from the CRP, to the UNAM PGSC for noting and issuing of the Research Permission Letter by the Director: Postgraduate Studies;

3.2 Rejects the research proposal and recommends de-registration of the student to the UNAM PGSC;

3.3 Recommends registration at a lower level for a PhD candidate (Master's by Thesis only).

I.5 COLLABORATIVE POSTGRADUATE TRAINING

1) Through collaborative arrangements, students may undertake part of their training with other institutions of higher learning that the University is collaborating with.

2) Registration of students on collaborative programmes will be guided by the particular Memorandum of Understanding.

3) The implementation of collaborative programmes should adhere to terms and conditions stipulated in the Memorandum of Understanding.

I.6 CANCELLATION AND EXEMPTION OF MODULES

1) All postgraduate students are expected to acquaint themselves with the deadline dates for cancellation and exemption of modules as stipulated in the Faculty, Postgraduate and General Rules and Regulations Prospectuses.

2) No module cancellations or cancellation of studies will be effected without the completion of the required cancellation form signed by the student and Faculty Officer: Postgraduate Studies.

3) Students have to submit a complete exemption application form before the stipulated due dates to the Centre for Postgraduate Studies after recommendation by the relevant lecturer and Head of Department.

I.7 APPLICATION FOR BREAK IN STUDIES

1) Students who are unable to register for a specific year are expected to apply before **31 October** for break in studies for the subsequent academic year, to the UNAM Postgraduate Studies Committee through the Faculty Postgraduate Studies Committee for a maximum period of one academic year. Reasonable justifications for the leave of absence should be provided.

2) When a student is on approved break in studies, the year of non-registration will not count as part of the duration of the study. However, students must re-apply before the closing date of applications for admission to activate their registration for the subsequent academic year.

3) A student who takes a break studies for a period of one (1) years will be required to:

4) Apply for re-admission to the University and Faculty/program.

5) Satisfy all requirements for admission, and

6) Start the programme from the first year.

I.8 APPLICATION FOR LEAVE OF ABSENCE

In order to be admitted to examinations, students are required to attend at least 80% of the lectures and to complete the required elements that make up the continuous assessment mark. Students who are unable to attend classes/tests for any reason, must complete the necessary application form (obtainable from the Office of the Registrar), and supply the necessary documentation. The application must be seen by all lecturers concerned, who will provide their comments and signatures. Final approval rests with the Registrar's Office. It will be the responsibility of the student to make up for missed events/complete the relevant requirements (including tests).

I.8.1 ABSENCE DUE TO MATERNITY

Students who request absence from classes/tests for the purpose of delivery, must apply beforehand (application form obtainable from the Office of the Registrar), and provide a medical certificate, signed by a Medical Practitioner, indicating the expected date of delivery. Students will be expected to attend classes two weeks prior to and after the date of delivery. Should the date of delivery differ from the expected date students, on resumption of classes, will be expected to furnish a medical certificate stating the new date. A new, late application for absence from classes must be completed by the student in such cases.

I.8. 2 ABSENCE DUE TO FUNERALS

Students who miss classes/tests due to funeral attendance must, prior to departure, apply for absence from classes (application form obtainable from the Office of the Registrar). On return, the student must supply satisfactory proof which confirms that the student attended the funeral. On receipt of the above mentioned, the application will be processed further. Students should note that absence from classes/tests should not exceed one week.

I.8.3 ABSENCE DUE TO ILLNESS & OTHER REASONS

- Students who miss classes/tests due to illness, must produce a valid medical certificate, signed by a Medical Practitioner, stating the period of absence and nature of the illness. An application for absence from classes must be completed by all students before or not later than five days after the illness, depending on the circumstances (application form obtainable from the Office of the Registrar). Students who are in possession of surgery dates, etc. will be expected to apply for absence from classes prior to their leave of absence. Permission will only be granted for emergency cases. The Registrar's Office reserves the right to reject such applications if the illness does not warrant absence from classes/tests.
- Students should note that reasons such as over-sleeping, car trouble, transport problems, misreading the examination timetable, etc. will not be considered as valid reasons for missing tests / classes / examinations.

I.9 COURSEWORK EVALUATION AND GRADING

1) Students who are registered for postgraduate programmes by coursework will be examined according to procedures approved by Senate.

2) In all Schools, the meaning attached to letter grades awarded by examiners is as follows:

Grade	Interpretation	% Equivalence
A	Distinction	80 and above
B	Very Good	70 – 79
C	Good	60 - 69
D	Satisfactory	50 - 59
E	Fail	49 and below

3) Before a student can proceed to the thesis/dissertation research phase (in the case of coursework programmes), s/he must first pass all coursework modules. Subject to faculty regulations, a student with one module outstanding may register for the research project, provided that the outstanding module is not Research Methodology or module that deals with research or data analysis.

I.10 THESIS/DISSERTATION RESEARCH

1) Students who successfully complete the coursework phase, or who are registered for postgraduate studies by thesis/dissertation alone, undertake research in an approved research topic, and write a thesis/dissertation. This shall be after a specified period set by the relevant Committees and approved by Senate.

2) **Thesis** and **Dissertation** research may include an artistic/aesthetic component, presented in the form of a composition, a theatre/musical performance, and/or an exhibition of original works, as a partial fulfilment of the requirements for a **Master's** or **Doctoral** degree, respectively.

3) As a standard practice, every thesis/dissertation shall be accompanied by a declaration stating that it has not been submitted for a similar degree in any other university (Annex 2).

4) The thesis must contain a concise and comprehensive **abstract** of between 200-300 words and 300-400 words for the dissertation, indicating the main findings and major conclusions of the research. The abstract should be Times New Roman, font size 12, and 1.5 line spaced.

I.11 REGULATIONS ON THE TEACHING AT POSTGRADUATE LEVEL

1) To teach and supervise students at the master's and doctoral programme levels, a member of staff shall have a doctoral degree or equivalent in the discipline of the postgraduate programme being offered.
2) To teach and supervise students at the postgraduate diploma programme levels, a member of staff shall have a Master's or equivalent in the discipline of the postgraduate programme being offered.
3) Members of staff without PhD or equivalent qualifications but with specialised expertise can co-teach with members of staff holding doctoral degrees.

I.12 GUIDELINES ON THE RESEARCH SUPERVISION OF POSTGRADUATE STUDENTS

I.12.1 ASSIGNMENT OF SUPERVISORS

1) Every postgraduate student shall be assigned a supervisor/supervisors (at least **one** (1) supervisor for Master's students and **two (2)** supervisors for Doctoral candidates) nominated by the relevant Department, recommended by the relevant Faculty Postgraduate Committee and approved by the UNAM Postgraduate Studies Committee on recommendation of the Faculty Postgraduate Studies Committee.
2) Where the student's research topic is multidisciplinary in nature, or where there is need for additional expert supervision in the same discipline, or where the student's postgraduate training programme involves sandwich arrangements, one or more additional supervisors may be appointed.
3) Postgraduate student supervisors will be appointed from suitably qualified members from UNAM Faculties/Centres; where there is a need to appoint an external supervisor there should be another supervisor from UNAM.
4) A supervisor for Master's and Doctoral students must have a doctoral degree and expertise in the field of study that he/she is expected to supervise. In addition, the supervisor must have relevant research and publication experience.
5) For purposes of mentorship, the co-supervision at all levels is strongly recommended. A supervisor without a doctoral degree will be considered to supervise Master's students (normally as a co-supervisor) subject to approval by the UNAM PGSC.

I.12.2 GENERAL DUTIES AND RESPONSIBILITIES OF POSTGRADUATE SUPERVISORS

1) The supervisor must have a thorough understanding of the University's Postgraduate Regulations and Guidelines, in order to effectively guide the student towards attaining the stipulated standards.

2) The supervisor has the responsibility of ensuring that their students make progress in their studies. Where there are problems affecting the student's research progress, these shall be communicated to the UNAM Postgraduate Studies Committee through the Head of the relevant Department and the Faculty Postgraduate Studies Committee.

3) Supervisors should understand that:
   (a) The Master's thesis research programme is designed as a **training** course, whereby it is intended that the student will:

   * be exposed, acquire and apply fundamentals of research,
   * acquire certain new techniques and methods of research,
   * learn how to present the results of research in a scholarly manner, and
   * make some contribution to knowledge.

   (b) Master's students require close and careful supervision because they usually lack previous research experience, especially during the early stages of their theses (when learning about research methodology, experimental design and research technique) and also when preparing the initial drafts of their theses.

4) The supervisor of a Doctoral candidate should recognise that the candidates, in most cases, will have acquired some research experience when they were Master's degree students. What is expected of the Doctoral candidate is thus qualitatively and quantitatively more than outlined above for Master's degree students. Here the supervisor expects the candidate to:
   * make a **distinct and original contribution** to **knowledge**, of fact and/or theory;
   * produce a considerable amount of **original work**;
   * undertake a more critical and extensive review of the relevant literature than is the case for Master's students, and

* exercise considerable initiative in conducting the research.

5) After completion of a research proposal, the doctoral candidate should be able to work **independently** and be **guided** rather than be directed by his/her supervisor. It is, nevertheless, the supervisor's responsibility to guide the candidate in the right direction.

6) During the initial phase, the supervisors have the responsibility of assisting their candidates in the design and formulation of appropriate postgraduate research projects.

7) Supervisors should be able to determine, through their previous research experience, potential impediments to the research problem and advise the students on what can be achieved meaningfully, within the time allocated for the study.

8) The supervisors have the responsibility of monitoring the student's research progress throughout the research period:

   (a) Both the supervisor and the student must submit **compulsory** report on the progress of the student to the relevant Departmental HoD before the end of each semester (Annex 3A and 3B). The Faculty PGSC will study the reports and take the necessary steps to resolve problems (where necessary).

   (b) Where the departmental HoD is the supervisor, the deputy dean of faculty should sign.

   (c) A summary report of all progress reports received and recommendations from the Faculty PGSC on problems identified and actions taken must be tabled during the **July and November** UNAM PGSC meetings.

   (d) In order to ensure that the thesis/dissertation research proposals benefit from inputs from other academics in the Departments, every Faculty offering postgraduate programmes shall, in consultation with the supervisors, arrange at least one **compulsory** research seminars, which will enable the candidates to refine and improve the research proposal, report on progress and learn from others.

9) The supervisor has the ultimate responsibility of assisting the student to give an appropriate title to the thesis/dissertation, and to guide him/her on the presentation of the research results in the form of a scholarly thesis/ dissertation, in accordance with the set guidelines.

10) The supervisor and student should have regular meetings to discuss progress on the research project.

11) Although the writing of the postgraduate thesis/dissertation is the responsibility of the student, it is the supervisor's role to ensure that the standards set by the University are adhered to. The supervisor should:
   (a) be accessible to the student during the critical stage of thesis/dissertation writing;

   (b) discuss the drafts of the thesis/ dissertation with the student throughout the process;

   (c) read the student's thesis/ dissertation carefully and critically, indicating where improvements are needed, e.g., where there is paucity of information, and where the important findings could be published, , etc.;

   (d) at the conclusion of the work, read the entire thesis/ dissertation, and advise whether or not it is in a form suitable for presentation to examiners;

   (e) but should not be responsible for personally editing language usage in the thesis, or correcting typographical errors. He/she should however, point out language and typographical errors.

12) If the student has two or more supervisors, one of these should be appointed as main supervisor and the rest as co-supervisor(s).

13) Should a supervisor be away from the University for more than three consecutive months, an acting supervisor must be appointed. In the case of absence of main supervisor, the co-supervisor will act. Where a student has only one supervisor an acting supervisor must be appointed by UNAM PGSC on recommendation of the FPGSC.

14) Where continued supervision is a condition of sabbatical or extended research leave, the Head of Department must ensure that these conditions are adhered to.

15) Where a supervisor retires or resigns from the University, he/she shall cease from supervising any student(s) under his charge, unless there is an agreement in writing for the continued supervision of the student(s).

16) If, in the course of the student's research, a situation develops whereby:
   (a) there is a breakdown in communication between the student and the supervisor;
   (b) there are personal clashes and conflicts between the two;

(c) the student refuses to follow the supervisor's advice;
(d) a change will enhance the progress of the student the case should be reported in writing to the Head of the relevant Department by either the supervisor or the student. The Head of Department has the responsibility to hear both sides of the case (that is, from the supervisor and the student) with a written report and recommendation to the FPGSC for possible action. The FPGSC will study the report and take action or make a recommendation (where applicable) to the UPGSC.

17) Staff members from research institutions will be allowed to supervise ten (10) students; the main supervision will be counted as 1 and co-supervision as 0.5 students, respectively. To ensure adequate supervision, a single staff member shall not supervise more than five (5) postgraduate students at any given time. Staff members' supervision responsibilities should be taken into consideration by Heads of Departments when other teaching duties are assigned.

I.12.3 REMUNERATION OF SUPERVISORS

All supervisors will be remunerated upon approval of the graduation of the student by AEC, according to the tariffs determined by the University from time to time (Annex 17). Progress reports of the student during the duration of the study, signed by the supervisor(s), should accompany the claim form (Annex 18).

I.13 REGULATIONS AND GUIDELINES GOVERNING THE SUBMISSION OF THESES AND DISSERTATIONS FOR EXAMINATION

I.13.1 NOTICE OF INTENT TO SUBMIT THE THESIS/DISSERTATION FOR EXAMINATION

1) At least **three (3) months** prior to the scheduled date for the submission of the **thesis** and **four (4) months** prior to the scheduled date for the submission of the **dissertation**, the respective postgraduate students shall, through their supervisors, Departments and Faculty PGSC, submit a written notice, to the UPGSC, declaring their intention to submit their theses/dissertations (Annex 4A). This is in order to allow sufficient time to organise the appointment of examiners before the submission of the thesis/dissertation.

2) Students who submit a notice of intent within a shorter period than specified in paragraph 1 above should note that the examination might be delayed.

3) Students who fail to submit their theses or dissertations within the time period indicated in the notice of intent should note that the examination of their thesis/dissertation may be delayed as new examiners may need to be appointed.

4) The abridged curriculum vitae of internal and external examiners nominated by relevant Faculty PGSC and Annex 4B shall be submitted together with the notice as per Annex 4A for approval by the UNAM Postgraduate Studies Committee (see Annex 5 for the format of the abridged curriculum vitae).

5) Student shall submit **three** ring bound copies of the Master's thesis and **four** ring bound copies of the doctoral dissertation (including soft copy in word version) through the relevant HoD postgraduate studies to the Centre for Postgraduate Studies for examination by the **end of October of each year**. The submission of the bound copies should be accompanied by a signed form (Annex 6).

6) Students submitting the thesis or dissertation after the due date may not graduate and must re-register and **pay the required fees** for the subsequent academic.

7) Students with no re-admission statuses must appeal for re-admission for the subsequent academic year, irrespective of the fact that the thesis or dissertation might have been submitted for examination.

I.13.2 APPOINTMENT OF EXAMINERS

1) Every Master's thesis submitted shall be examined by at least two examiners approved by the UNAM Postgraduate Studies Committee on recommendation by the Faculty Postgraduate Studies Committee. At least one of the examiners in each case must be external to the University of Namibia, except when the student is a staff member in which case **all** examiners must be external. **The supervisor(s) should not be one of the examiners.**

2) Upon receipt of the notice of intent from the student, the Head of the Department should complete and submit Annex 4B together with the abridged CV's of the potential examiners to the FPGSC for recommendation and approval by the UNAM PGSC. Heads of Departments must declare any potential conflict of interest in the nomination and

appointment of examiners. **Examiners may NOT be selected from the pool of moderators already approved for modules in the specific taught programme.**

3) In the case of doctoral dissertations, at least three examiners shall be appointed, of whom two must be external to the University, except **when the student is a staff member in which case all examiners must be external. The supervisor(s) should not be one of the examiners.**

4) Internal and External Examiners will be appointed on the basis of their expertise, independent from appointment of external moderators already approved for modules in the specific programme.

5) The examiner should not have any direct involvement in the research project of the student and must declare any past or present (personal or professional) connections with the student. Before final appointment the examiner should declare any direct conflict of interest by signing Annex 7.

6) An examiner for Master's students and Doctoral candidates must have a doctoral degree and expertise in the field of study that he/she is expected to examine. In addition, the examiner must have relevant research and publication experience.

7) The Director: Centre for Postgraduate Studies shall issue a letter of appointment to the thesis or dissertation examiners (Annex 8).

Examiners shall complete examination in the following periods: Mini thesis (Master's) = 6 weeks; Thesis (Master's) by research = 6 weeks; and Doctoral dissertation = 8 weeks.

I.14 REGULATIONS AND GUIDELINES GOVERNING THE EXAMINATION OF THE SUBMITTED MASTER'S THESES AND DOCTORAL DISSETATIONS

I.14.1 EXAMINATION OF MASTER'S THESES AND DOCTORAL DISSERTATIONS

1) Each examiner shall be required to examine the thesis or dissertation in detail and submit his/her comprehensive assessment under the following headings:
   (a) **Appropriateness of the thesis title.** Comment on the appropriateness of the title as it relates to the content of the thesis or dissertation.

   (b) **Introduction:** comment on the validity of the research problem, the extent to which the questions or objectives address the identified research problem and the justification for the study.

   (c) **Completeness of the Literature Review**. Comment on the ability of the student to describe other researcher's contributions to similar problems. The literature review should lead the reader to a good understanding of what is already known about the research topic, what gaps of knowledge exist, what the study was intended to contribute, and what hypotheses guided the study. The examiners should comment on the candidate's familiarity with the literature.

   (d) **Research Methods**: The examiners should also comment on the appropriateness of the research methods (and instruments, where relevant) employed in the study. Where applicable, comment on ethical considerations should be included.

   (e) **Presentation of the Results**: The examiners should comment on the manner in which the findings of the study are presented. If tables of data are provided, are they reduced statistically? Are the statistical analyses appropriate? If illustrations are provided, are they of publishable quality? Is the description of the research results of adequate clarity and scholarship?

   (f) **Discussions and Conclusions**: Are the conclusions clearly presented? Are they logical and supported by data? Has the candidate sufficiently indicated how his/her results compare with those of others, as cited in the literature? From the thesis/dissertation, is his/her contribution to new knowledge clearly brought out? In the case of Doctoral dissertations, is there evidence of sufficient originality? If there are weaknesses in the thesis/ dissertation, what are the shortcomings?

   (g) **Recommendations:** Are the recommendations formulated address what was not reported in the thesis? Will the recommendations lead to addition of new knowledge to the current study?

(h) **Language and Technicalities:** Is the language used clear and concise? Are there major typographical errors? Is a language editor needed? (Where applicable).

(i) **References:** Are all the references cited in the text recorded on the reference list (and vice versa)? Are recent references used? Are the references used appropriate to the study? Is there consistence in the style of referencing used?

Summary: The examiner should present a summary indicating whether s/he recommends the thesis or dissertation for a postgraduate degree award. Exam should allocate marks for the thesis by following guidelines in Annex 9, and complete the Summary Form (Annex 10 & 11).

2) All examination reports must be submitted to the Director: Centre PGS within a stipulated time from the date of receipt of the documents. If the assessments are not received within two months, new examiners may be appointed.

3) The Director: Centre for Postgraduate Studies will forward the reports to the relevant HoD PGS, who will be responsible for distributing the reports to the supervisor.

4) Once the relevant HoD PGS has received **all** the reports for a particular student he/she removes the names and affiliation of the examiner as well as the allocated marks and distributes the amended report to the supervisor.

5) The supervisor will share the reports with the student to make the indicated corrections. Where the reports contain conflicting recommendations, the supervisor will guide the student in addressing them.

6) The revised thesis or dissertation together with a comprehensive table of corrections must be submitted to the supervisor to verify that all corrections have been made before the thesis or dissertation is bound.

7) Upon evaluation of the thesis, the examiner will recommend one of the following:
   a) PASSES subject to MINOR corrections ($\underline{\geq}$ 50%)
   b) PASSES subject to MAJOR corrections ($\underline{\geq}$ 50%)
   c) RE-SUBMIT FOR RE-EXAMINATION (no mark allocated)
   d) FAIL (< 50%)

   A thesis re-submitted for re-examination shall be re-examined by the same examiner and awarded a maximum mark of 50%.

8) Upon evaluation of the dissertation, the examiner will recommend one of the following:
   a) PASSES subject to MINOR corrections
   b) PASSES subject to MAJOR corrections
   c) RE-SUBMIT FOR RE-EXAMINATION
   d) FAIL

   No marks should be allocated for the dissertation. A dissertation re-submitted for re-examination shall be re-examined by the same examiner.

9) (a) Where a Master's thesis is recommended for re-submission, **it must be re-submitted within 6 months,** failure to do so the student will be deemed to have failed the thesis and will not be re- admitted.
   (b) Where a Doctoral dissertation is recommended for re-submission**, it must be re-submitted within 12 months,** failure to do so the student will be deemed to have failed the dissertation and will not be re- admitted.

10) Where a thesis or dissertation is submitted for re-examination, the examiner should indicate whether the student has satisfactory addressed the identified shortcomings in the first submission.

11) In cases where the examiners of the thesis disagree in their recommendations (fail versus pass), Faculty PGSC should recommend an independent external examiner to the UNAM PGSC for approval to serve as arbiter on the thesis.

12) Where two examiners fail a dissertation the student will be deemed to have failed the dissertation and will not be re-admitted.

13) Where one examiner fails a dissertation, School PGSC should recommend an independent external examiner to the UNAM PGSC for approval to serve as arbiter on the thesis or dissertation.

14) For both theses and dissertations the assessment of the arbiter will be FINAL.

15) A **copy of the first version** of the thesis or dissertation submitted for examination will be sent to the arbiter.

16) In cases where the difference in the pass marks allocated for a thesis, by the internal and external examiner, is **20% or more**, the Departmental Head must set up a departmental committee (excluding the supervisor and internal examiner) to study the case and recommend a mark for the thesis and provide a motivation on the decision to the UNAM PGSC,

through the Faculty PGSC. Where the departmental Head is the supervisor or the examiner, the Dean shall appoint an independent person to study the case and recommend a mark for the thesis and provide a motivation for his/her decision to the UNAM Postgraduate Studies Committee.

17) **All examination reports**, including any reports that recommended a fail must be submitted by the faculty PGS HoD to the UNAM Postgraduate Studies Committee for recommendation to AEC.

18) A postgraduate student, who disagrees with the results of the examination as approved by AEC, may appeal to the HoD PGS within two weeks after the release of the results giving reasons and evidence to support the appeal.

I.14.2 PUBLICATION FROM A THESIS OR DISSERTATION

Students are encouraged to publish work from their thesis/dissertation in accredited journals. The following acknowledgements must be included in such publications:

"This work forms part of a Master/PhD study undertaken at the University of Namibia".

Any publication from thesis/dissertation must show UNAM as the student's affiliation.

A list of publications and conference presentations by the student, that was part of their study, should be listed in the thesis immediately after the abstract.

I.14.3 VIVA VOCE EXAMINATION FOR STUDENTS REGISTERED BY THESIS OR DISSERTATION

1) In addition to writing a thesis or dissertation, the postgraduate students who are registered for Master's by Thesis and all Doctoral students, shall appear for a *viva voce* examination, to defend the submitted work before a panel of specialists on the subject.

2) The Centre for Postgraduate Studies is responsible for administering the *viva voce* examinations for doctoral students while the respective Faculties/departments are responsible for administering the *viva voce* examinations for master's students.

3) The *viva voce* examination shall take place only after the UNAM PGSC is satisfied that the thesis or dissertation submitted by the student is considered by the examiners to be of an acceptable standard.

4) The questions to be asked in the *viva voce* examination shall primarily be focused on the student's thesis or dissertation research area. **The public can attend and WILL BE PERMITTED to ask questions.**

5) The ***viva voce* panel** shall consist of the examiners and supervisors of the thesis or dissertation.

6) The Chairperson of the *viva voce* panel shall be a senior academic (at least at the rank of Associate Professor for Doctoral students and Senior lecturer for Master's students) and shall not be one of the supervisors or examiners. The *viva voce* panel (including the chairperson) shall be approved by **the Director of the CPGS** on recommendation of the relevant HoD PGS.

7) The main supervisor must provide the relevant HoD PGS with an electronic copy of the corrected thesis or dissertation, who will distribute it, together with copies of the examiners' reports to the panel members at least two weeks before the date of the *viva voce* examination.

8) All members of the *viva voce* panel must acquaint themselves with the postgraduate processes and procedures.

9) The functions of the *viva voce* panel shall be:
   (a) to ascertain that:

   * the thesis/dissertation presented (the data, methodology, analysis and findings) is the original work of the student

   * the shortcomings identified during the examination process have been addressed.

   * the broader subject area in which the study is based is fully grasped by the student.

   * any weaknesses in the thesis/dissertation can be adequately clarified by the student,

(b) to make a definite recommendation to AEC through the UNAM PGSC, as to whether the student be deemed to have **passed** or **failed** the study (Annex 12).

10) The *viva voce* panel shall, as far as possible, endeavour to reach a unanimous decision on the student's performance. Where the panellists are unable to reach a consensus as to whether the student passes or fails, a vote may be taken to arrive at a reasonable decision. A majority vote shall be required for passing the *viva voce* examination.

11) (a) At the end of the viva voce, the panel shall sign a *viva voce* Examination Results Form (Annex 12) making a specific recommendation to AEC through the UNAM PGSC on the student's performance.
(b) The Chairperson of the panel shall also submit to the UNAM PGSC a **comprehensive report** (Annex 13) signed off by the *viva voce* panellists. This should be done within one week of the examination. The report should include, an attendance register, challenges faced with the *viva voce* examination, a summary of the presentation, the discussion during the *viva voce* examination, any strong/weak points identified during the presentation and discussions, including any specific recommendations to the student.

12) The duration of the *viva voce* shall be **two hours for masters and three hours for PhD**.

13) The Chairperson of the *viva voce* Panel should announce the recommended outcome of the examination to the audience; but the qualification can only be awarded after approval by AAGC.

I.14.4 SUBMISSION OF FINAL BOUND THESES OR DISSERTATIONS

After all the corrections as recommended by the examiners (including those from the viva where applicable) have been made to the satisfaction of the supervisor(s), **five** fully bound copies of the theses or dissertations shall be submitted to the Faculty PGSC for inspection before submission to the Centre for Postgraduate Studies. Where a student has been supervised by more than one supervisor, an additional copy for each additional supervisor must be provided. In addition, an electronic version of the thesis or dissertation compiled as a single document in **PDF** format shall be submitted. Please note that the final thesis or dissertation must be in the format as prescribed in B19.

I.14.5 PRESENTING STUDENTS FOR GRADUATION

The Faculty Officer: School will only submit the names of students for graduation approval by AAGC on recommendation of the UNAM PGSC when the following conditions have been met:

1) Updated academic record reflecting the eligibility of the student for graduation.
2) Completed checklist confirming, amongst others, that corrections have been effected after receipt of examiners reports and *viva voce* examinations, (including a table of corrections), where applicable.
3) All signed examination reports (including, where applicable, arbiter/failed examination report).
4) Five (5) bound copies and one (1) electronic copy (in PDF format) of the Thesis or Dissertation has been submitted as per Regulation B.16.4.

I.14.6 REMUNERATION OF EXAMINERS

All examiners will be remunerated upon receipt of the examination report compiled using the examination guidelines in B.16.1, according to the tariffs determined by the University from time to time.

I.14.7 AWARDING OF A QUALIFICATION AT A LOWER LEVEL

1) A student who is de-registered for a taught Masters programme due to failure to successfully complete the research component, may be awarded a relevant and existing Postgraduate Diploma in the field provided that all the taught modules are passed and the research component is re-written and passed as a research project/paper. Award of this PGD is subject to approval by AEC on recommendation of the UNAM PGSC.

2) A student who was awarded a Postgraduate Diploma according to paragraph (1) above, will not be allowed to register for the same taught master programme at a later stage.

3) A student who fails a Masters by research, may be allowed to re-apply for re-registration on a completely different topic or a taught Masters programme.

4) A student who fails a PhD, may be allowed to re-write the dissertation in the format of a thesis incorporating all the recommended amendments and corrections of the examiners within a period of 12 months after the release of the results. The re-submitted thesis will be examined according to the regulations of Masters degrees.

5) A Student who was awarded a Master's degree according to paragraph (4) above, and wish to apply for a Doctoral programme at a later stage, will have to choose a different topic.

I.15 POSTGRADUATE FEES

All registered students shall pay the various categories of fees as approved by the University Council on recommendation of appropriate Committees of UNAM (Refer to Student Fees booklet and PG Studies Fees brochure).

I.16 GUIDELINES ON THE WRITING OF POSTGRADUATE WORK

I.16.1 GUIDELINES ON THE WRITING OF RESEARCH PROPOSALS

Outline of the proposal

All research proposals must be prepared according to the following layout:

Title of the proposed study (refer to Annex 14 for the format of the title page)

The title of the mini thesis/thesis/dissertation research proposals should be clear and concise. From the title, one should be able to infer clearly the subject of the mini thesis/thesis/dissertation. This means that the title should be self-explanatory and limited to the scope of the study.

1. INTRODUCTION

1.1 **Background of the study**

Give a general overview and background of the research problem.

1.2 **Statement of the problem**

Students should concisely formulate their research problems by clearly indicating research issues they would like to investigate in their studies. This should include the purposes of their studies

1.3 **Either objectives of the study or research questions (NOT BOTH)**

Based on the statement of the problem, students should state either objectives or research questions of their studies. They should do this unambiguously.

1.4 **Hypotheses of the study (where applicable)**

Where applicable, particularly in the Natural Sciences, students should state unequivocal and testable hypotheses that are based on theory and on the statement of the problem. Each hypothesis should have a clear rationale.

1.5 **Significance of the study**

Students should state the importance of their studies, the anticipated contribution of such studies to knowledge and to socio-economic progress.

1.6 **Limitation of the study**

Students should indicate the logistical, resource and other limitations of their studies and indicate the possible impact of such limitations.

1.7 **Delimitation of the study**

Students should indicate the specific scope of the study, providing the rationale for such delimitation.

2. **Literature Review and where applicable, the theoretical framework**

Students should prepare critical, synthesised and integrated literature reviews that should demonstrate the need and justification of their studies. The reviews should show gaps in knowledge, theoretical and methodological shortcomings, need for further research, unanswered questions, and disagreements in literature and theoretical frameworks that may need to be revised to resolve controversies. In addition, the reviews should demonstrate what has been done in research areas of interest and what remains to be investigated.

3. **Research Methods**

3.1 Research Design

Students should provide clear statements on either quantitative or qualitative research designs they intend to use. It is not necessary to provide the definitions of the research designs. However, they should specify how they intend to use particular research designs in their studies. They should not merely provide the distinction between the two generic designs.

Population (where applicable)

Students should, where applicable, specify the population to which they would like to confine their research/studies.

3.2 Sample (where applicable)

Students should clearly explain how they intend to draw samples from the target populations. They should specify how they intend to appropriately use either quantitative or qualitative sampling techniques to draw research samples. Merely describing what these sampling techniques are is inadequate.

3.3 Research Instruments (where applicable)

Research instruments and measures that would be used to collect data should be clearly provided under this section.

3.4 Procedure

The manner in which data would be collected should be explained here. How research instruments would be used to collect data should be specified in this section.

3.5 Data analysis (where applicable)

In this section, students should provide specific descriptive and/or statistical tests that they would employ to analyse their data, and rationale. Mere reference to particular quantitative data analysis statistical packages and electronic qualitative data analysis procedures would not be sufficient.

3.6 Budget (where applicable)

3. Research Ethics

Students should provide detailed information about ethical issues and *how* they will address potential ethical dilemmas when conducting their research.

4. References

Students should use the referencing format approved by respective faculties/departments. Where there is no prescribed referencing format by faculty/department, the ***American Psychological Association*** **(APA)** becomes the default. There must be consistency between sources cited in the text of the proposal and sources of information indicated in reference lists. Unless critical in the area of research, primary and secondary sources of information cited shall not be more than 10 years old. Students should use refereed/verifiable sources of information.

Research proposals submitted for consideration by the Faculty Postgraduate Studies Committee shall capture the above information in a clear and concise manner and not exceed the maximum page number stated below:

a) Master's by coursework (mini thesis) shall not exceed 6 pages
b) Master's by research shall not exceed 8 pages.
c) Doctoral Degree shall not exceed 10 pages.

In all cases the research proposal should be **Times New Roman, font size 12, double spaced** and on one side of the paper.

The School PGSC recommends the research proposal to UNAM PGSC for noting after evaluating the proposal using Annex 15, and issuing of the Research Permission Letter (Annex 16) by the Director: Postgraduate Studies;

De-registration of postgraduate students who fail to make progress

Schools shall deregister postgraduate students who fail to make progress as stipulated under B.6.2.

I.17. REGULATIONS AND GUIDELINES FOR WRITING AND PRESENTATION OF POSTGRADUATE THESES AND DISSERTATIONS

Broad Guidelines on Mini Thesis/Thesis/Dissertation Manuscript Preparation

Typing/Word-processing

The document must be typed and printed on good quality white A4 paper. The typescript must be clear, Times New Roman, font size 12, double spaced and on one side of the paper.

Pagination

The preliminaries (i.e., parts preceding the Introduction) must be in lower case Roman numerals (i.e.: (i), (ii), (iii), (iv)...), beginning with the title page which should not be numbered. The pages in the main body of the document should be

numbered in Arabic numerals (i.e.: “1”, “2”, “3”, “4”...) consecutively throughout. The page numbers should be centred in the lower margin.

Margins

The left margin must be 4.0 cm; the right hand margin must be 2.5 cm; the top margin must be 2.5 cm, and the bottom margin must be 2.5 cm.

Title page

The title page must be organised according to (Annex 14)

Components of the preliminary pages (Each starting on a separate page)

Abstract

Following the title page, the mini thesis/thesis/dissertation shall contain an abstract which concisely and comprehensively summarises the essential points and conclusions emanating from the research. The abstract should be between 200-300 words (not exceeding 1 page) in the case of Master’s theses, and 300-400 words (not exceeding 2 pages) for Doctoral dissertations. Furthermore, it should include the purpose of the study, a brief overview of the methodology used, the main findings, major conclusions and recommendations. The abstract should not contain headings with 1.5 line spaced.

List of Publication(s)/Conference(s) proceedings

A list of publications and conference presentations by the student, that was part of their study, should be listed in this section. Any publication from thesis/dissertation must show UNAM as the student’s affiliation.

Table of Contents

The Table of Contents shall be generated to include level three subheadings.

List of Tables

If there is a list of Tables, these should be consecutively numbered in Arabic numerals following the guidelines of the relevant department/faculty approved referencing style.

List of Figures

If there is a list of Figures, these should be consecutively numbered in Arabic numerals following the guidelines of the relevant department/faculty approved referencing style.

List of Abbreviations and/or Acronyms

Acronyms and non-standard abbreviations should be listed alphabetically in bold; the definitions should not be bolded.

Acknowledgements

The document shall also contain an Acknowledgements section, in which the candidates express their appreciation and gratitude to all the people and institutions which rendered help in the course of the study.

Dedication

If the candidate wishes to dedicate the document to any person, the dedication should be concisely written, and should appear in the preliminaries.

Declarations

The document shall contain the various declarations as outlined in (Annex 2)

Body of the Thesis/Dissertation

a) Master Theses should broadly follow the outline in the proposal (B18.1). In addition it should include results, discussions, conclusions and recommendations as detailed below.

Tables, text figures, diagrams and photographic illustrations should be numbered in separate sequence, and be referred to by number in the text. Each table and figure should have a concise but comprehensive caption. The illustrations should be of publishable quality (600 dpi or higher).

Results:

- Data should be presented in a clear and concise and informative manner.
- A variety of forms might be used to present data, however the same data **must not** be presented in more than one form(for example tables and figures)
- Where applicable primary data should be attached as an appendix and not appear in this section

Discussions:

- It should not merely be a description of the findings (tables and figures)in words
- This section forms the core of the document and therefore need to be a critical analysis of the results and demonstrate insight and understanding of the findings.
- Results and findings must be discussed in context and linked to literature and the stated research aims.
- The discussion must address the objectives and/or questions of the study

Conclusions:

- This should not be a repeat of the results and /or discussion
- It should relate directly to the main objective(s) of the study.
- It must indicate whether the problem was solved, what was learned through the research, what remains to be learned, weaknesses and shortcomings of study, strengths of study as well as possible applications of study (how it can be used).

Recommendations

- Must emanate from the research findings and must be feasible
- Gives opinion on what measures should be adopted to solve the problem based on the conclusions made.
- May endorse the research findings as the solution to the problem or may propose an alternative route.
- Identify information gaps or inconsistences and suggest further studies to address these.

References

Should follow the department/faculty specific referencing style

Appendices

Should be numbered sequentially and can include the following:

- Ethical clearance certificate
- Research permission letter
- Other relevant permissions (where applicable), e.g., collection permits, informed consent documents, etc.
- Data collection Instruments such as questionnaires, interview protocols, pre and post-tests etc.
- Any other relevant data such as supplementary information, raw data etc.

b) Doctoral Dissertations should follow a **stand-alone chapter** (journal publication) approach.

Tables, text figures, diagrams and photographic illustrations should be numbered in separate sequence, and be referred to by number in the text. Each table and figure should have a concise but comprehensive caption. The illustrations should be of publishable quality (600 dpi or higher).

Introduction Chapter (Chapter 1)

This chapter must introduce the study and provide a comprehensive overview of the research problem, and broadly follow the guidelines as indicated above.

Literature Review (Chapter 2)

- This chapter must provide a comprehensive literature review and broadly follow the guidelines as indicated in (B.19).
- This should demonstrate critical understanding and comprehension of the current state of knowledge in the area of research and lead to the motivation for the study.
- The literature should focus on recent developments in the area of study.

Stand-alone chapters

Each Faculty and/or department has a choice to decide whether to use a stand-alone chapter or use the guidelines for Master thesis.

Guidelines for stand-alone chapters are as follows:

Each of these chapters **introduces and represents an independent research aim/objective/question** and should follow the outline below:

Title, Abstract, Keywords, Introduction, Materials and Methods, Results and Discussion, Conclusion, and References (Should follow the approved department /school/ faculty specific referencing style).

Concluding chapter

This chapter integrates all findings of the study and conclusions with feasible recommendations/reflections. Original contribution(s) to knowledge must be clearly pointed out.

Appendices

Should be numbered sequentially and can include the following:

- Ethical clearance certificate
- Research permission letter
- Other relevant permissions (where applicable), e.g., collection permits, informed consent documents, etc.
- Data collection Instruments such as questionnaires, interview protocols, pre and post-tests etc.
- Any other relevant data such as supplementary information, raw data etc.

Language

The presentation of the thesis or dissertation shall be in English. The use of a language other than English requires approval of the UNAM PGSC. In such cases, the abstract must be in both English and the approved language.

Length of Theses/Dissertations

The suggested guidelines are as follows (A4 double spacing):

(a) **Master's theses for coursework programmes(Mini Theses)**: The recommended length of Mini theses for coursework programmes is as follows:
- Mini Theses with less than 100 credits: a minimum of 15,000 words and a maximum of 22,000 words (not exceeding 90 pages).
- Mini Theses between 100–140 credits: a minimum of 18,000 words and a maximum of 30,000 words (**not exceeding 120 pages**).
- Mini Theses above 140 credits: a minimum of 30,000 words and a maximum of 37,000 words (not exceeding 150 pages).

(b) **Master's theses (by research)**:

- The recommended length of a Master's thesis is a minimum of 30,000 words and a maximum of 45,000 words (**not exceeding 180 pages**).

(c) **Doctoral dissertations**:

- The recommended length of a Doctoral dissertation is a minimum of 46,000 words and a maximum of 75,000 words (**not exceeding 300 pages**).

Binding of Theses/Dissertations

(a) Candidates should ensure that when binding the theses/dissertations, the spine shall contain the name of the candidate, the degree for which it was submitted, and the year of degree award **(graduation year).**

(b) The colour of the cover for Master's theses shall be **red** and that for Doctoral Dissertations shall be **black**.

Note: The thesis/dissertation MUST be subjected to plagiarism software i.e. Urkund.

ANNEX 1

SUPERVISION AGREEMENT BETWEEN GRADUATE STUDENT AND SUPERVISOR

This **supervision agreement** between

Name of student: ……..

Student number: ……

Faculty: ……

Department: ……

and (on behalf of UNAM)

Name of supervisor: ……

Department: ……..

And (if applicable)

Name of co- supervisor: ……

Department: ……..

Regarding post-graduate research for the degree of: ……..

Research topic: ……

……

By signing this document, both student and supervisor(s) acknowledge their understanding and obligations of the general expectations and responsibilities regarding the supervision of the thesis/dissertation as contained in the UNAM Postgraduate Studies regulations prospectus.

……	……..	…….
Name of Student	**Signature**	**Date**
……..	……..	……
Name of Supervisor	**Signature**	**Date**
……	……	……
Name of co-supervisor (where applicable)	**Signature**	**Date**

……. ……. ……

Name of Department HoD **Signature** **Date**

……. ……. ……

Name of Faculty HoD: PGS **Signature** **Date**

ANNEX 2

DECLARATIONS WHICH MUST BE CONTAINED IN THE SUBMITTED THESES/ DISSERTATIONS

Format of declarations to be included in every thesis/dissertation:

DECLARATIONS

I, [student's name], hereby declare that this study is my own work and is a true reflection of my research, and that this work, or any part thereof has not been submitted for a degree at any other institution.

No part of this thesis/dissertation may be reproduced, stored in any retrieval system, or transmitted in any form, or by means (e.g. electronic, mechanical, photocopying, recording or otherwise) without the prior permission of the author, or The University of Namibia in that behalf.

I, [student's name], grant The University of Namibia the right to reproduce this thesis in whole or in part, in any manner or format, which The University of Namibia may deem fit.

……..	……	……
Name of Student	**Signature**	**Date**

I. M. SC. RANGELAND RESOURCES AND MANAGEMENT [17MSRR]

I.1 ADMISSION REQUIREMENTS

I.1.1 The University of Namibia general regulations regarding admission of students to Master's Degree programmes shall apply.

I.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.

I.2 ASSESSMENT

The following were adopted to ensure high standards and competitive degree quality:

I.2.1 A 3-hour theory examination at the end of each course;

I.2.2 A pass mark of 60% for all courses, including the thesis;

I.2.3 A weighting of 50:50 for continuous assessment (CA) and the final examination;

I.2.4 At least 3 different continuous assessments for each course for core courses and 5 for generic courses;

I.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;

I.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.

I.2.7 A student can remain registered for a maximum of 4 years.

I.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.

I.3 DEGREE STRUCTURE

The following will be the structure of the degree.

I.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.

I.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.

I.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.

I.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.

I.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.

I.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.

I.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.

I.3.8 Six core courses will be taught each semester with a week's break between the core teaching blocks.

I.3.9 Core course examinations will be written immediately after the course, during the inter-block break.

I.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.

I.4 TEACHING MODE

This will include; lectures, field work, discussion seminars, case studies, group projects etc.

I.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 thesis must be externally examined.

I.6 PROGRAMME SCHEDULE

FIRST YEAR SEMESTER 1

	Courses	Code	Periods	NQF Level	Pre-requisite	Credits	Compulsory/ Elective
	Academic writing for Postgraduate Students	UAE 5819	04/56	8	None	16	Compulsory
	Research/Exp Design and Analysis	ASC 5900	2/0.3	9	None	8	Compulsory
	Geographic Info systems & Remote Sensing	ASC 5920	1.1/1.2	9	None	8	Compulsory
	Into Integrated Resource Management	ASC 5981	7/w+pr3/w	9	None	12	Compulsory
	Rangeland Ecosystem Structure & Function	ASC 5991	7/w+pr3/w	9	None	12	Compulsory
	Soil Dynamics	ASD 5981	7/w+pr3/w	9	None	12	Elective
	Water Dynamics	ASW 5981	7/w+pr3/w	9	None	12	Elective
	Environmental Physiology	ASE 5981	7/w+pr3/w	9	None	12	Elective
	Land Use Planning	ASL 5981	7/w+pr3/w	9	None	12	Elective
	Fodder Flow	ASF 5981	7/w+pr3/w	9	None	12	Elective
	Rangeland Management	ASR 5981	7/w+pr3/w	9	None	12	Compulsory
	Total Credits Semester 1						**128**

FIRST YEAR SEMESTER 2

	Courses	Code	Periods	NQF Level	Pre-requisite	Credits	Compulsory/ Elective
	Research/ Exp Design & Analysis	ASC 5900	2+pr03	9	None	8	Compulsory
	Geographic Info Systems & Remote Sensing	ASC 5920	1.1 + pr1.2	9	None	8	Compulsory
	Rangeland Degradation and Its Mitigation	ASC 5992	7/w+pr3/w	9	None	12	Compulsory
	Nutrition of Foraging Animals	ASN 5982	7/w+pr3/w	9	None	12	Compulsory
	Sustainable Livelihoods	ASS 5982	7/w+pr3/w	9	None	12	Compulsory
	Range Biodiversity and Conservation	ASR 5982	7/w+pr3/w	9	None	12	Compulsory
	Wildlife Ecology & Management	ASC 5982	7/w+pr3/w	9	None	12	Elective
	Natural Resource Economics	ASE 5982	7/w+pr3/w	9	None	12	Elective
	Natural Resource Policies	ASP 5982	7/w+pr3/w	9	None	12	Elective
	Total Credits Semester 2						**100**
	TOTAL CREDITS YEAR 1						**228**

SECOND YEAR 2

	Courses	Code	Periods	NQF Level	Pre-requisite	Credits	Compulsory/ Elective
	Research Project/Thesis	ASC 5910		9	None	128	Compulsory
	TOTAL CREDITS YEAR 2						**128**

TOTAL PRGRAMME CREDITS **356**

I.6 MODULE DESCRIPTORS

I.6.1 FIRST YEAR MODULES

AASC 5900: RESEARCH / EXPERIMENTAL DESIGN AND ANLYSIS

Module Title: RESEARCH / EXPERIMENTAL DESIGN AND ANALYSIS
Code AASC 5900
NQA Level 9
Practicals/week: 28 weeks (64 Contact Hours) compulsory
Credits 16
Modules Assessment: Assessment: CA [50%] at least 5 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA: 50%
Exam: 50%
Prerequisites None

Module Content:
A:Social research methods: Research paradigms and associated methodologies; positivism, phenomenology and critical theory: A critical difference between quantitative and qualitative research in terms of the nature of their empirical data should be discussed, purpose and nature of research, a basic overview of research design and methodology. Survey research; define and explain the purpose and describe the types, survey research cycle, discuss the advantages and challenges of the research strategy and methodology and the role of indicators, describe data gathering techniques, instruments analysis and presentation. Participatory rural appraisal (PRA); define, and explain the purpose and describe the types of PRA, PRA cycle, research strategy and methodology, the advantages and value, challenges and shortfalls of the method. The research proposal: define the research proposal, its purpose and the steps involved in writing it. Clearly and fully describe the layout and contents of the research proposal. Describe how research proposals should be evaluated, and the importance of that step. Scientific communication Describe what should be contained in a research report. Explain the importance of an oral presentation, and how it should be prepared and done

B:Research/Experimental Design and Analysis Review of basic analytical techniques: review basic concepts of graphical and numerical data summary i.e. how to summarize data in form of tables and graphs, how to calculate measures of central tendency and measures of dispersion, merits and demerits of each of the measures of central tendency and measures of dispersion, the ideas of probability and confidence intervals in relation to statements made about results of experiments and surveys; the importance of the normal, F-distribution and t-distribution in statistics; the sampling distribution of the mean and hypothesis testing and introduce the concepts of sampling error and standard error and calculation of confidence intervals. Standard Experimental Designs; Completely randomized design; show how to design a simple experiment using the principles of replication, randomization and local control; analysis of variance (ANOVA), results of one-way ANOVA, compare treatment means, and how to present the results. Discuss the advantages and disadvantages of the design. Randomized block design, principle of blocking including advantages and disadvantages; latin square designs and its usefulness; factorial experiments. Comparison of treatment means: describe the most important procedures for mean comparisons and when they should be used. e.g. LSD, DMRT, Orthogonal contrasts. Explain the difference between comparison-wise and experiment-wise error rates, discuss the advantages and disadvantages of the most popular multiple comparison tests. Regression and correlation: the concept of dependent and independent variables, the uses and abuses of the simple and multiple regression; calculate and interpret correlation coefficient and coefficient of determination; the concept of least squares point estimates and least squares regression line and how to test hypothesis about a regression line; polynomial regression (polynomial fitting), types of curves e.g. exponential growth curves, logistic curves. Non Parametric Statistics: Introduce alternative tests to the parametric tests used in previous units, advantages and disadvantages of non-parametric tests. Multivariate statistics: introduction to the nature of multivariate data and the range of interdependence techniques available for exploring and analyzing multivariate data sets, the concept of classification and

explain analyses using the different cluster analysis techniques; the concept of gradient analysis using ordination techniques, indirect gradient analysis (e.g. Principal Components Analysis, Detrended Correspondence Analysis) and direct gradient analysis (e.g. Canonical Correspondence Analysis) with practical examples. Other ordination approaches can also be covered, multivariate Statistical Analysis software packages (e.g. CANOCO for Windows, TWINSPAN for Windows, PC-ORD for Windows, NMMDS, DECORANA) and demonstrates how they are used.

AASC 5920: GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING

Module Title:	GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING
Code	AASC5920
NQA Level	9
Contact Hours:	28 weeks (64 Contact Hours) compulsory
Credits	16
Modules Assessment:	Assessment: CA [50%] at least 5 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module 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

Module Title:	INTRODUCTION TO INTERGRATED RESOURCES MANAGEMENT
Code	AASC5981
NQA Level	9
Contact Hours:	40 (4 weeks) compulsory
Credits	16
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:

Ecosystem approach: principles to ecosystem management; ecosystem structure, functions and integrity; ecosystems connectivity; scales in ecosystem management, e.g. basin management; application of Convention on Biology Diversity and Ecosystem Approach Toolkit. Dealing with complexity and dynamism; Socio-ecological system components, behavior and interactions; scales in socio – ecology system. Institutions of Natural Resource Management: institutional arrangements in governing natural resources; decision making process, trade-offs and competing interests; conflict resolution mechanisms, challenges and best practices; policy responses in the southern African region regarding Natural Resource Management (NRM), property rights, legal frameworks, regulations regarding amongst others: pricing and subsidies, markets, Community Based Natural Resources Management (CBNRM). Adaptive management and action research: shifting paradigm from seeking solutions to generating learning opportunities to continuously improve ecosystem management; integration of formal scientific knowledge and local knowledge in an adaptive management framework; approaches to engage interest groups as partners in action research; formulation of action research; measuring natural resource performance. Knowledge management: partnerships in multi-stakeholder issues; data management (spatially reference data), including local knowledge; information sharing approaches aiming to achieve shared understanding of system properties and change; organization/institutional learning.

Systems analysis tools: models as management tools; application of modeling to natural resource management; data bases, GIS; decision and negotiation support tools.

AASC 5991: RANGELAND ECOSYSTEM STRUCTURE AND FUNCTION

Module Title:	RANGELAND ECOSYSTEM STRUCTURE AND FUNCTION
Code	AASC5991
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:
This course aims at describing the general structure and processes that are characteristic of Southern African rangelands. Southern African rangelands are a basic resource for the survival of the majority of Southern African rural population. Proper and sustainable management of these rangelands require defining these rangelands in Southern Africa and the processes that drive them. Types and distributions of major rangeland types will be described to illustrate the diversity of structures, including floristically and including the faunal species associated with the rangelands.

Rangeland ecosystem structure consists of the soil, plants, animals and invertebrates. Foraging activities of rangeland herbivores play an important role on the integral functioning of rangelands. These effects will be discussed to lay the foundation on principles and practices associated with the rangelands. Changes occurring on rangelands, the causes and models used to describe these changes as well as implications of understanding and describing rangeland dynamics on rangeland management.

Defining Southern African rangelands; understand the significance of the different scale and levels of organization in rangeland description; understand the major Southern African biomes and their determinants; understand the role of grazing and grazing management on rangeland ecosystem integrity as well as understanding of rangeland vegetation dynamics models.

AASD 5981: SOIL DYNAMICS

Module Title	SOIL DYNAMICS
Code	AASD5981
NQA Level	9
Standards Competencies	N/A
Contact Hours:	4 weeks (40 Contact Hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:
Soil chemical processes: discuss the dynamics of nutrient cycling in the context of the impacts of rangeland management practices on the rates and directions of the various processes involved, describe surface functional groups, sorption processes and exchange reactions in soils, quantity-intensity relationships in soils, discuss redox chemistry and soil acidity and alkalinity and their relevance in soil management. Comparative analyses of the various chemical processes across different soil types and climatic gradients, implication of rangeland management practices on soil chemical properties and soil and processes. Soil organic matter (SOM): biophysiochemical processes in soils (e.g. decomposition, properties of SOM,) and their importance in rangeland management. Impacts of various management practices on the nitrogen cycle. Comparative analyses of the various processes involved across different soil types and climatic gradients. Implications of rangeland management practices on soil biophysiochemical properties and soil processes. Soil water, the holding capacity, measurements, and flow in the soil. Inferences should be made on issues related to soil erosion, irrigation, drainage and floods as the result of improper management strategies. Water movement in soil (Darcy's law of water flow), soil morphology; and soil conservation.

AASW 5981: WATER DYNAMICS

Module Title	WATER DYNAMICS
Code	AASW 5981
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:

Water cycle: components of the water cycle and the fluxes of the planet's water, implications on the management of plants, animals and the land as a whole. Climate, drought, flood, water quantity and quality (both surface and ground water). Water quality standards used in the southern African region should be explained, especially the one used by the South African River Health Program such as SASS5 (or similar).The need to continuously monitor water quality in rangeland ecosystems must be explained – how and why it is done. Watershed management, watershed water balance, watershed water capture, storage and release. Water harvesting and utilization especially given that much of southern Africa is semi-arid to arid. Water pollution, sources and types. Policies and legislation addressing water pollution must be discussed with particular reference to rangeland management. Ways of preventing and mitigating water pollution.

AASE 5981: ENVIRONMENTAL PHYSIOLOGY

Module Title	ENVIRONMENTAL PHYSIOLOGY
Code	AASE 5981
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:

Introduction to physiology of foraging animals: cell structure and function (The significance of knowledge of cell structure and its functions in understanding physiological process). Osmo-regulation and excretion, circulating body fluids and functions.
Respiratory system. Climatic Physiology and temperature regulation: regulation of body temperatures. Adjustment to ambient temperature variation; cold, response to heat. Morphological and anatomical features relevant to temperature regulation. Body conformation, limits of temperature regulation in hot and cold. Water and animal physiology: distribution of body water; water balance; Photoperiodism: seasonal physiological change; allometry of food intake (energy requirements, body size); genetic adaptation; reproductive and digestive physiology: importance in terms of production assessment.

AASL 5981: LAND USE PLANNING

Module Title	LAND USE PLANNING
Code	AASL 5981
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:

Land use planning; familiarize students with concepts of existing land use planning guidelines e.g. for land evaluation, agro-ecological zoning and discuss their application in the Namibia context; environmental sustainability, criteria, current land use cover and land cover change detection; land use planning procedure, participatory methods for local and regional land use planning; techniques of resource survey and mapping, food agriculture organization (FAO) framework and guidelines for land evaluation; land capability classification; agro-ecological zoning methodology; importance of GIS and remote sensing in land use planning and image processing; decision support tools in local-level land use planning. Land tenure: Land tenure regimes governing land use in southern Africa; opportunities and challenges underlying tenure systems; land rights and tenure arrangements.

AASF5981: FODDER FLOW

Module Title	FODDER FLOW
Code	AASF5981
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:

Fodder production from rangelands: Discuss the importance of natural grasslands as major sources of nutrients for range animals including wild life; the nutritional limitations of utilizing natural grasslands and appropriate mechanisms for improving their nutritional quality applicable to range communities especially pastoralists; overview of the different pasture management practices to improve productivity of native pasture lands, livestock productivity, animal husbandry practices and disease control; the importance and methods of reseeding and over sowing; methods of establishing cultivated pastures and conditions, choice of plant species and management of cultivated pastures.

Management of sown and improved tropical legume pastures: Explain the concept of incorporating forage legumes into natural grasslands and their role in providing quality fodder to range animals while preserving the natural resource base; the factors which affect and favor legumes in grass/legume pastures, overview of fertilizer use to improve pasture productivity and factors limiting their use in tropical rangelands especially in Africa; explain the principles and importance of pasture biomass assessment and its application in pasture management, soil surface protection and erosion; Utilization and conservation of forage: Explain the importance of fodder utilization and conservation, the different methods of forage conservation e.g. standing hay or differed feed, hay, silage and haulage.

Fodder flow planning: strategies for drought feeding: Explain the nutrition aspects of drought feeding and the strategies to be adopted for different agro-ecological zones; discuss the different strategies for feeding range animals in periods of severe feed shortages (drought feeding); the strategy for drought feeding based on molasses and other supplementary feed stuffs.

AASR 5981: RANGELAND MANAGEMENT

Module Title	RANGELAND MANAGEMENT
Code:	AASR 5981
NQF Level:	9
Contact Hours:	4 weeks (40 Contact Hours) Compulsory
Credits:	12
Module Assessment:	CA 50%: at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations) Examination 50%: One 3 hrs written examination paper
Prerequisites:	None

Module Content:

Students will be exposed to topics such as Eco-physiology of southern Africa, rangeland herbivorous interaction, rangeland management, carrying capacity, current land issues, range monitoring and evaluation, sustainable use of rangeland and drought mitigation strategies, problems of bush/weed encroachment on rangeland pastures and methods of control; grazing management and methods for optimum utilization of range pastures, the importance of fire in the management of range forages and as a tool for control of weeds. review the different methods of pasture assessment emphasizing tropical rangeland pastures, e.g. pasture yield, pasture composition, estimating number, frequency and vegetation cover, basal area of a pasture, pasture

structure, trees and shrubs. Students will also be exposed to practical activities at the farm at Neudamm and elsewhere within the country.

AASC 5982: WILDLIFE ECOLOGY AND MANAGEMENT

Module Title	WILDLIFE ECOLOGY AND MANAGEMENT
Code	AASC 5982
NQA Level	9
Contact Hours:	40 contact hours (4 weeks) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:

Population dynamics: define wildlife and wildlife management and its importance; the factors which influence fluctuations of animal populations in the wild; the patterns of growth of animal populations and the differential equations which describe the various patterns (logistic, geometric and exponential); explain the need for reliable information on population size and reproductive rates; the inherent qualities/properties of wildlife populations: rate of increase, age structure, lifespan, sex ratio, fecundity/natality and mortality; interspecific dynamics, intraspecific dynamics, territoriality and home range, dispersal patterns and migrations; the mechanisms of population regulation, including density-dependent and density-independent factors (and how these can be extrinsic or intrinsic). Wildlife nutrition and water requirements: Wildlife feeding and nutrition; influence of variations in gut anatomies (including feeding classes), body sizes and physiology on nutritional requirements. Counting wild animals: Emphasize the importance of collecting data on animal counts in wildlife management, pros and cons of the various methods applied in animal censuses; discuss home range, territories and social organization: the use of some statistical models to characterize home ranges of animals such as minimum convex polygon model, density estimation models (bivariate, normal, harmonic mean, and kernel), the importance of radio telemetry as a tool in many modern studies of animal behaviour, ecology, management and conservation; home range utilization (intensity of use) by wild animals and the concept of the 'centre of activity; define a 'territory' and compare and contrast a home range and territorial behaviour. Define a 'social animal' and social organization in wild animal populations; social behaviour.

Wildlife utilization and conservation systems in southern Africa: Define wildlife utilization/harvesting and explain the purposes including the concept of maximum sustained yield (MSY) and optimum sustained production (OSP), culling controversies, conservation and the causes of wildlife extinctions considered in the issues such as: types of protected area systems and their functions, ecosystem-based vs species-based approaches, influence of size of protected area, minimum viable population concept and population viability analysis, importance and effects of corridors, culling in parks and reserves and its controversies, conservation outside parks and reserves, and community-based wildlife management initiatives in southern Africa, international conservation issues including IUCN Red Data Books, the role of CITES, etc.

AASC 5992: RANGELAND DEGRADATION AND ITS MITIGATION

Module Title	RANGELAND DEGRADATION AND ITS MITIGATION
Code	AASC 5992
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:

Define rangeland degradation; causes of rangeland degradation; indicators of rangeland degradation; state of rangeland degradation in Sub-Saharan Africa; mitigating rangeland degradation; rangeland restoration and rehabilitation and reference ecosystem; the ecological trajectory; challenges and opportunities.

AASN 5982: NUTRITION OF FORAGING ANIMALS

Module Title	NUTRITION OF FORAGING ANIMALS
Code	AASN 5982
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:

Nutritional diversity of rangeland forage. Define the term rangeland in its broad sense and give an overview of the feeding and nutrition of animal; discuss the species and diversity of range forages and their nutritive value. Discuss biotic factors including plants anatomy, differences in plant parts, plant age, stage of growth; and biotic factors including season of growth, range site conditions, stocking rate, livestock and wildlife species. Animal foraging behavior and diet selection: Diet selection and foraging behavior; wildlife feeding nutrition; factors affecting food availability, quantity and quality. Review the classification of range forage base, on their functional attributes and the types of foods eaten including bulk/ roughages grazers, concentrate selectors and intermediate feeders. Factors which influence diet selection of foraging animals. Determination of the amounts and quality of nutrients derived from grazing animal's diets. Foraging behavior of range animals including foraging tactics of range animals. Establish forage quality effects on foraging behavior of animals; Present and discuss the inherent factors which affect diet selection by foraging animals.

Range land animal nutritional requirements: The concept of animal nutritional requirements to support metabolic activities for normal health and vigor, growth rate, reproduction and or normal lactation levels; the roles and requirements of the most important nutrients essential for the metabolic activities of foraging animals. Discuss the three protein fractions when considering the protein requirements , soil and plant factors which affect mineral content of pastures; the important major minerals required for grazing stock production , role of anti – nutritional factors and their effects on nutritive value of forages.

AASS 5982: SUSTAINABLE LIVELIHOODS

Module Title	SUSTAINABLE LIVELIHOODS
Code	AASS 5982
NQA Level	9
Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:

Land, agriculture, poverty and rural livelihoods in Africa – an introduction on food security, poverty and sustainable development; Rangeland Resource Management (RRM): Services and Markets; Describe issues that revolve around effective rangeland resources management e.g. service provision, research, communication and interaction between service providers and clients, refinements. Cross-cutting RRM including issues such as decentralization, governance and institution building, impacts of HIV/AIDS on RRM, engendering rangeland resource management. Land and agrarian reform; discuss technical information and background on the history of land and agrarian reform and introduce models currently implemented in Namibia, South Africa and Mozambique, supplemented by other relevant examples from the region. Sustainable Livelihoods Framework. Hands on application of the livelihoods framework.

AASR 5982: RANGE BIODIVERSDITY AND CONSERVATION

Module Title	RANGE BIODIVERSITY AND CONSERVATION
Code	AASR 5982
NQA Level	9

Contact Hours:	4 weeks (40 Contact Hours) compulsory
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:
Inventory, assessment and monitoring of rangeland biodiversity with particular emphasis on rangeland; review and discuss inventory assessment and monitoring approaches; discuss the importance of red data lists, their advantages and disadvantages. Valuation of rangeland biodiversity; categories of biodiversity, economic evaluation of and applicability of various methods and approaches to rangeland resources. Bio-systematic considerations for conservation of rangeland biodiversity; ecological and taxonomic views of biodiversity and how they are linked. Conservation strategies and current issues. Conservation genetics: principles and procedures underlying various modern techniques of measuring genetic diversity; interpretation and use in conservation genetics. Local and international conventions on biodiversity (convention on biological diversity, United Nations Convention to Combat Desertification (UNCCD), Convention on International Trade on Endangered Species of Fauna and Flora (CITES).

AASE 5982: NATURAL RESOURCE ECONOMICS

Module Title	NATURAL RESOURCE ECONOMICS
Code	AASE5982
NQA Level	9
Lecturers /week:	4 weeks (40 Contact Hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%
Exam:	50%
Prerequisites	None

Module Content:
Introduction to natural resources economics, environmental economics and agricultural economics: economic value of rangeland natural resources, use and non-use values, economic valuation of range resources including biodiversity, species and habitats, ecosystem function, conservation, water, soils, incentives and appropriation of value-local and global. RM and NRM relevant applications: cases from southern Africa; natural resources accounts: Botswana, Namibia, raising local natural resource benefits and lowering local opportunity costs: CBNRM, assessing the economic impact of desertification: Namibia, differential land use, land taxation in Namibia, poverty rights and common-pool resources: examples and lessons learnt in southern Africa and elsewhere. Introduction to some analytical tools, cost effectiveness analysis, benefits and costs, supply and demand, economic efficiency and markets. National budgets, international financing, aid: strategy overviews; financing RRM: public and private investments, budgeting, Government budgets, aid, cooperation and trade. Current RRM relevant economic debates: top hits; food security, land reform, alternative land uses: weighing the economic-social and environmental benefits and value, water pricing, valuation of protected areas, access and benefit sharing: how to unlock the potential of natural resources, international trade and subsidies: how does the global economy affect RRM in southern Africa and international aid: What is needed and what is useful.

AASP 5982: NATURAL RESOURCE POLICIES

Module Title	NATURAL RESOURCE POLICIES
Code	AASP5982
NQA Level	9
Lecturers /week:	4 weeks (40 contact hours) elective
Credits	12
Modules Assessment:	Assessment: CA [50%] at least 3 assessment opportunities (e.g. tests; written assignments; reports; oral presentations). Final Exam [50%]: One 3 hour written examination.
CA:	50%

Exam: 50%
Prerequisites None

Module Content:
Policy formulation, analysis and implementation. The price linkage: fiscal expenditures; support for agriculture; improving the incomes of the rural poor. Gender and rural development: the key issues for discussion here are the deeply rooted traditional codes of condition, division of labor and unfair inheritance laws. Principal aspects of a legal framework; Policy analysis and implementation; agricultural policies and their impact on other natural resources in the economy; competitiveness of developing countries' exports in the world market; the existence of mega tariffs of 200- 300 % on agricultural commodities in developed countries; trade liberalization and the reallocation of resources towards a country's comparative advantage

UAE 5819: ACADEMIC WRITING FOR POSTGRADUATE STUDENTS

Module Title ACADEMIC WRITING FOR POST GRADUATE STUDENTS
Code: UAE5819
NQF Level: 9
Contact hours: 4 lecture periods per week and 1 practical session per week for 14 weeks
Credits: 16
Module Assessment: CA: (1 x 3 hour exam paper)
Prerequisites: Must be a postgraduate student.

Module Content:
This module is a post-graduate course designed to empower students with skills and knowledge to access and critique academic sources and to synthesize information from these sources to assist them in the substantiation and development of their own claims when writing an academic paper in their respective fields of specialization. Additionally, this course will empower students with the capacity to undertake the challenges of academic writing by exposing them to the different rhetorical and stylistic elements typical of academic texts. Finally, students will be introduced to the American Psychological Association (APA) writing style and will be equipped with the necessary skills to format an academic paper in APA style.

I.6.2 SECOND YEAR: THESIS COMPONENT

AASC 6910: RESEARCH PROJECT / THESIS

Module Title RESEARCH PROJECT/THESIS
Code AASC 6210
NQA Level 9
Contact Hours: Second Year; Compulsory
Credits 128
Modules Assessment:
Thesis component
Only students who have successfully passed all coursework shall be allowed to undertake research in Range Resource Management. Each student is required to propose a topic and write a proposal for research before the end of the first year. The official registration for the thesis will depend upon acceptance of her/ his proposal by Postgraduate Students Committee.

Two (2) supervisors are recommended per student and the main supervisor must be from UNAM and must be a PhD holder. All thesis 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.

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