VISION

To be an agricultural university of international repute

MISSION

To produce quality graduates for the agricultural sector through innovative teaching and research

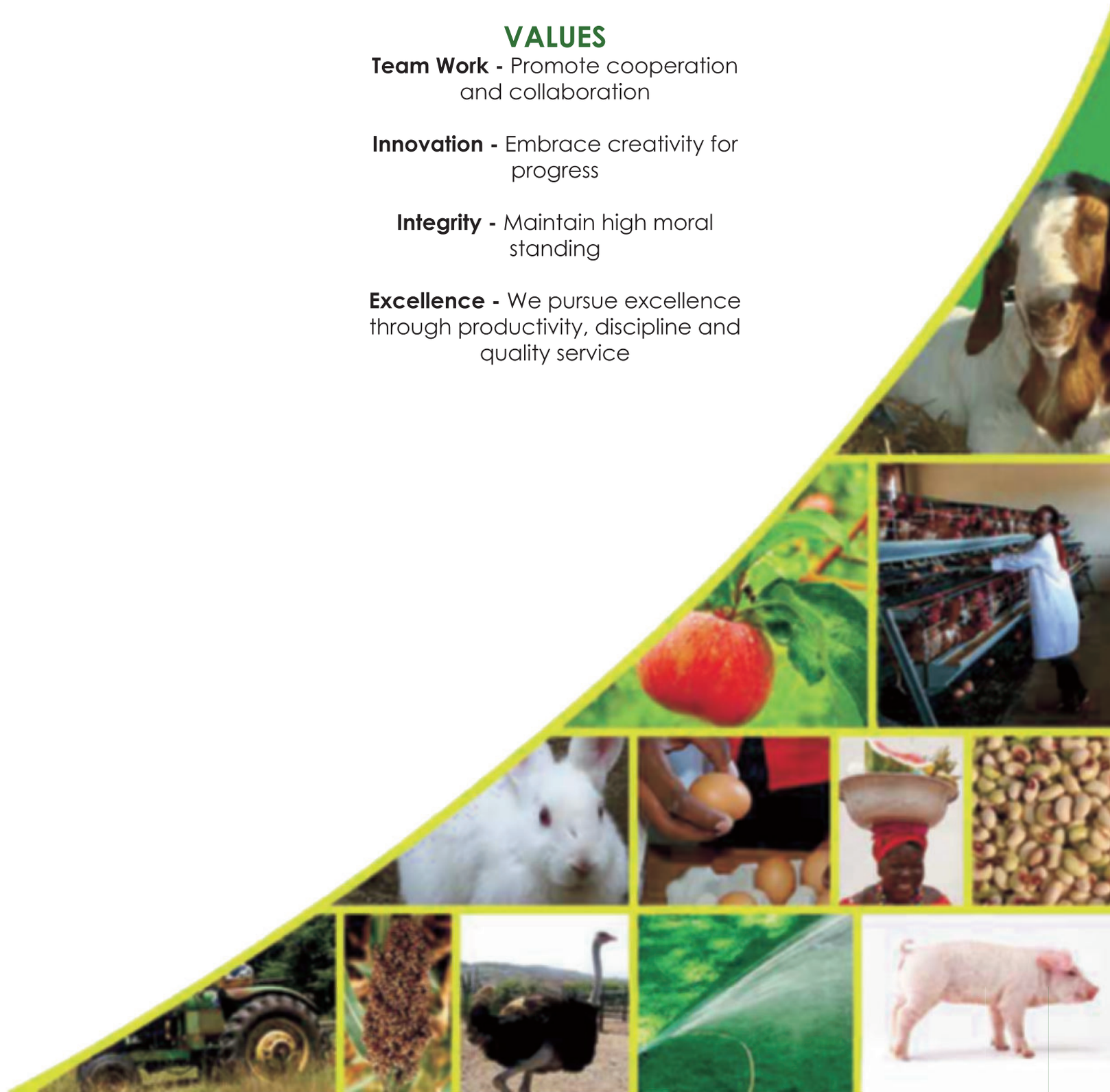
VALUES

Team Work - Promote cooperation and collaboration

Innovation - Embrace creativity for progress

Integrity - Maintain high moral standing

Excellence - We pursue excellence through productivity, discipline and quality service



Addresses

Location:
Botswana University of Agriculture and Natural Resources
Content Farm, Sebele, Gaborone
(12 km North of Gaborone City Centre)

Postal Address:
Botswana University of Agriculture and Natural Resources
Private Bag 0027
Gaborone, Botswana

Website Address:
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Standard Chartered Bank
Barclays Bank of Botswana Ltd.

Auditors:
Pricewaterhouse Coopers

Lawyers:
Moeletsi & Motumise Attorneys

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EXECUTIVE MANAGEMENT OF THE BOTSWANA UNIVERSITY OF AGRICULTURE & NATURAL RESOURCES

Acting Vice Chancellor: Dr. M Tapela, BSc (UB), MSc, PhD (ISU)

Dean Faculty of Agriculture: Prof. KB Mmolawa, BSc (UB), MSC (Cranfiled), PhD (USA)

Deputy Dean Faculty of Agriculture: Dr B Sebolai, BSc (UBS), MSc, PhD (Nebraska)

Manager, Corporate Services: Mrs S Mazwiduma, BASS (UB), MPA, HRM (UB)

Finance Manager: Mr DL Monametsi, BA (UBS)

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Mr D. L. Monametsi
BA (UBS)

05 **Manager, Corporate Services**
Ms S. K. Mazwiduma
BASS (UB), MPA (HRM) (UB)

HISTORICAL NOTE

On the 16th July 2015, the Parliament of Botswana passed the Botswana University of Agriculture and Natural Resources (BUAN) Bill and the Act was assented to by His Excellency the President as Act No. 12 of 2015 on the 29th September 2015. The Act provides for the establishment of the Botswana University of Agriculture and Natural Resources and consequently repealed the Botswana College of Agriculture (BCA) Act no. 9 of 1991. With effect from 1st February 2016, BCA officially became the Botswana University of Agriculture and Natural Resources (BUAN). The University is a body corporate, and hence a parastatal under the Ministry of Agriculture. Transitional process to transform the new institution into a fully-fledged university is on-going.

The then Botswana College of Agriculture (BCA) was established on 31st May 1991 when Act No.9 - Botswana College of Agriculture Act 1991, enacted by Parliament of Botswana came into effect. BCA took over all the assets and liabilities of the former Botswana Agricultural College, which was abolished on coming into effect of act No.9 establishing BCA into its place.

The Botswana Agricultural College (BAC) was formally established in 1967 at Content Farm, Sebele, Gaborone, when the Ministry of Agriculture decided to transfer the certificate in Agriculture course, which had been offered since 1959 at Mahalapye. Assistance from the British charity organizations, Freedom from Hunger, and Oxfarm as well as funds obtained from the Botswana Government were used to construct the first buildings of the college. The total enrolment at Sebele was 67 students all registered for the 3 years sandwich certificate course in agriculture. In 1970, the certificate in Animal Health course which had been offered for sometime at the Ramatlabama Training Centre was also transferred to the college. In 1972 a certificate course in Community Development was introduced at the college and by 1973 the total enrolment of all the Certificate programmes was 170 students. During this period technical assistance was provided by, among other organizations, the British ODA; FAO/UNDP and the United States Peace Corps Organization.

During this period students from Botswana who wished to undertake higher level education (diploma, degree) in agricultural sciences and allied fields had to go to Luyengo, Swaziland, where the Swaziland Agricultural College and University Centre (SACUC) operating under the University of Botswana, Lesotho and Swaziland, offered diploma and degree level education for all the three BLS countries.

Following the break-up of the University of Botswana, Lesotho, and Swaziland in 1975 planning for higher level education in agricultural sciences was speeded up and by 1978, agreement had been reached between the Government of Botswana and the United States Agency for International Development (USAID) for an expansion project of the college. A total sum of US$12 million was spent in expanding the college facilities to enable it to double the enrolment at certificate level and introduce diploma programmes in General Agriculture and in Animal Health and Production. The first students were enrolled for the diploma programmes in 1981, and these diplomas were to be awarded by the University of Botswana unlike the certificate programmes which were Ministry of Agriculture awards. Interim arrangements were established for the University Senate to validate the diploma programmes through the Faculty of Science, pending the formal establishment of a Faculty of Agriculture.

Discussions on starting of BSc. degree training in Agriculture and establishment of a Faculty of Agriculture started from 1979, and involved among others, the Ministry of Agriculture (MoA); the Ministry of Education (MoE) and the University of Botswana (UB). The discussions and consultations have revolved around whether UB should establish a Faculty of Agriculture (at Sebele or elsewhere) to offer degree and diploma education and BAC should concentrate on the certificate and vocational training or BAC should be upgraded into a college under UB/or MoA to offer all the training at the three levels (certificate, diploma and degree).

In view of the anticipated small number of students who were expected to enrol in the agriculture degree programme, the expensive nature of facilities required for such training and the need to maintain economical student: staff ratios; it became quite apparent right from the outset that it would not be cost effective to have two training institutions for the agricultural sciences (one for degree and diploma under UB/MoE and one for certificate under MoA). In addition with UB being under MoE, and BAC; Agricultural Research Station (ARS) and Extension Services being under MoA, it was therefore decided to adopt a model which will ensure that linkages between BAC/Faculty of Agriculture, and ARS and the Extension services are maintained, as well as availing to UB effective mechanism through which it can ensure high and relevant academic standards for the programmes accredited to it. A Working Group Committee (WGC) was formed in 1984 by UB Council to superintend the merger process between UB and BAC. This WGC was chaired by Vice Chancellor UB, and included as its members, among others, the Permanent Secretaries of MoA, MoE, Finance and Development Planning and Local Government and Lands.

In 1985 it was decided, following studies by a number of consultants and study visits to a number of faculties of agriculture in the region that BAC should become a Constituent/Associate College of UB and a parastatal under the MoA. BAC as a College of UB was to offer both UB accredited programmes, as well as its own programmes such as the certificate courses and short term in-service and continuing education courses for staff of the MoA. The administration of the college was to be superintended by a Governing Council where UB, MoA and MoE would be represented as well as other members who are active in the agricultural sector of the nation. In October 1985, the WGC recommended that a Dean of Agriculture should be recruited to work out, in consultation with all concerned, detailed implementation programme embracing the teaching and administrative arrangements as well as the budgetary requirements. The Dean was appointed and started working at BAC in November 1987. Detailed curriculum and regulations for the BSc. degree were prepared and approved by UB Senate in April 1988 and UB Council in June 1988.

As a consequence of UB Councils approval of thecurriculum and regulations for the BSc. (Agriculture) degree programme the first cohort of students to register for this programme commenced their second year of study at Sebele with effect from August 1988 (the first year of study was done under Faculty of Science UB). Regulations for the diploma programmes as well as their curricula were reviewed and a new diploma programme in agricultural education was established with effect from February 1989.

Proposals on the administrative set up of BCA were also finalized and approved and this culminated in the enactment of Act No.9 by the Legislature in May 1991 and hence the establishment of BCA. BCA was officially inaugurated as an Associate Institution of the University of Botswana at the laters 11th Congregation held at Sebele on 2nd November 1991. The Chancellor of the University and President of the Republic of Botswana, His Excellency Sir Ketumile Masire officially inaugurated BCA at this ceremony, and awarded certificates, diplomas and as well as conferred for the first time in Botswana, the BSc. (Agriculture) degree, to the first group of graduands who had completed the programme in June 1991.

A certificate programme in Forestry and Range Ecology admitted its first cohort of students in August 1992 while the diploma programme in Agricultural Engineering enrolled the first group in February 1993. The Centre for In-service and Continuing Education started offering short courses in August 1992. A BSc degree programme in Agricultural Education admitted its first cohort of students in August 1996. The Diploma in Forestry and Range Ecology Programme (DFRE) commenced in August 1999, while the Diploma in Horticulture programme admitted its first students in August 2000.

The College undertook a curriculum review exercise of its diploma and degree programmes in 1998. This exercise was combined with the semesterisation of academic programmes, which was implemented in August 2002, in line with the vision and mission of the BCA and Vision 2016. Still in 2002, the BSc Animal Science programme was introduced and admitted its first cohort of students in the same academic year. The BSc Crop Science porgramme admitted its first group of students in August 2005. During the same year, the College abolished admission and training at certificate level, in view of focusing in training at higher levels. The BSc in Agricultural Mechanisation and BSc in Soil and Water Engineering were introduced in August 2007. The College also, during the same academic year introduced Graduate Programmes and admitted the first group of students into the MSc degree in Agricultural Education, MSc degree in Animal Science and MSc degree in Crop Science. The College gradually phased out the higher diploma in Agricultural Education, Agricultural Engineering and Horticulture with the last groups being admitted in August 2006. In August 2008, the College enrolled the first of students for MSc degree in Agricultural Engineering. The first student to graduate was from the Crop Science programme in October 2009, followed by two more in 2010 still from Crop Science. The College kept growing; in August 2009 it enrolled the first cohort of students into the Bachelor of Science Degree in Food Science and Technology and Bachelor of Science Degree in Agricultural Economics. The BSc degree programme in Agricultural Extension in August 2011and Diploma in Agricultural Extension in August 2013.

The College introduced PhD programmes and enrolled students in PhD Animal Science and PhD Crop Science in August 2012 and August 2014 respectively. In August 2015 the first group of students enrolled for BSc in Range Science.

The new programmes as well as the existing programmes shall provide training opportunities for students interested in the dynamic field of Agriculture in general. There are enormous challenges for Agricultural Scientists and extension workers to bring our farming community to the level where they could produce agricultural products costeffectively using well-researched technologies in order to compete in the global market

The semesterised programmes shall bring about flexibility in courses offered to the student and provide broad-based programmes through the General Education and Elective courses. The Faculty of Agriculture shall endeavour to carry out programme review on a continuous basis in order to meet the challenges of the local agricultural industry and the global trends in technology, marketing and agricultural development in general. The curriculum review and semesterisation have also addressed the need for agricultural graduates to go into self-employment rather than rely on limited jobs in the public and private sectors. Articulation of courses and programmes was been addressed at diploma and degree levels. The Higher Diploma in Agriculture was fully articulated with the BSc (Agric) programme. Similarly, the Higher Diploma in Agricultural Education was articulated with the BSc (Agric Education) programme. In other programmes individual courses were articulated such that where appropriate, the Diploma students take bachelors degree level courses. In line with the Government of Botswana agricultural development initiatives such as National Master Plan in Agriculture and Dairy Development (NAMPAADD) and others, which are meant to transform the agricultural sector from its subsistence state to a commercial level, graduates of Agriculture should be able to take advantage of these initiatives through business development programmes such as Citizen Enterprise Development Assistance (CEDA) in order to embark on agriculture-based enterprises.

STUDENT FACILITIES

The University has a wide range of facilities for students.

ON CAMPUS ACCOMMODATION

The University has Graduate hostel which has sixteen (16) rooms/beds. The Graduate hostel rooms are apartments of single room with self-catering facilities. Students share other facilities such as the kitchen and lounge.

HEALTH CLINIC

The University has a Health Clinic with two consultation rooms and a dispensary. Two nurses (Senior Nursing Sister and a Nursing Sister) run the clinic and if they feel that some cases require specialised medical attention then they refer such cases to Government Clinics and or Princess Marina Hospital in Gaborone. There is always a nurse on call during the night as well as weekends and holidays. The Nursing Sister is also qualified in Psychiatric matters and students who have mentally related disturbances see him.

RECREATION

The University has a Student Centre, which houses the Dean of Student Affairs, Clinic and the Nurses office, Recreation Officer, the SRC, the gymnasium, student bar and a multipurpose hall which can be used for such sporting codes as basketball, volley ball, badminton and table tennis.

BUAN also has outdoor facilities for lawn tennis, volleyball, basketball, soccer, softball and athletics. Rugby players use facilities in town while those interested in karate use facilities at the Botswana Defence Force Glen Valley barracks. All sporting entertainment activities provided by the University are open to all BUAN students. In view of a wide range of sporting codes a number of volunteer sports coaches have been enlisted to assist the Recreation Officer in coaching different sports codes.

COUNSELLING SERVICES

The Dean of Student Affairs is a social counsellor capable of dealing with a wide spectrum of social problems facing both the students and other members of staff. She is assisted by contracted team of other social counsellors/social workers from the University of Botswana who complement her work since the number of people wishing to use these services sometimes shoots up.

The University has employed an HIV/AIDS Coordinator to specifically address HIV/AIDS related issues among students and staff although this person is equally qualified to do general counselling like the other counsellors on campus.

GRADUATE STUDIES

GRADUATE STUDIES PROGRAMME COORDINATORS

Dr K Hulela – Department of Agricultural Economics, Education and Extension (Contact: Tel: 3650400)

Prof. C Patrick – Department of Agricultural Engineering and Land Planning (Contact: Tel: 3650195)

Prof OR Madibela – Department of Animal Science and Production (Contact: Tel: 3650225)

Prof. EV Emongor – Department of Crop Science and Production (Contact: Tel: 3650209)

Application Procedure

Prospective applicants may obtain information and application forms from the University premises, from the University web-site, or by enquiring through the office of the:

Assistant Manager (Academic Services)
Botswana University of Agriculture & Natural Resources
Private Bag 0027
Gaborone
Botswana
Telephone (267) 3650100
Fax: (267) 3928753

40.0 General Regulations for Master's and Doctor of Philosophy Degrees

40.1 Regulations Applicable to all Masters and Doctor of Philosophy Programmes

40.11 Masters and Doctoral degree programmes are subject to the Academic General Regulations 00.0, unless specified otherwise.

40.12 Applications for admission must be in accordance with General Regulations governing admissions, fees and programme regulations. Under no circumstances may an applicant begin work on the degree programme until registration formalities are complete.

40.13 The applicant must conform to Departmental and Faculty Regulations, which may consist of specific entry requirements, special conditions of study, details of required courses, and course assessment.

40.14 English is the medium of instruction and assessment. Applicants who have not taken a degree in the English medium must satisfy the Department and the School of Graduate Studies that they are proficient in English before they are admitted.

40.15 An applicant who has been admitted may be allowed to defer his/her admission for up to one year, by submitting a written request to the School of Graduate Studies. The request should include an explanation of the reason for the request.

40.16 A student may withdraw from studies by requesting permission to withdraw from the Department and from the School of Graduate Studies. When such a request is approved by the Department and the School of Graduate Studies, the students registration may be suspended for up to two years (four semesters).

40.17 When a programme has listed optional courses, not all of those courses will necessarily be offered in anyone semester.

40.18 Departments may from time to time approve courses from other departments as options without requiring special approval.

40.19 Departments shall approve method(s) of assessment for each course, and where appropriate, the relative weighting for each component of assessment in the total mark for each course. The details will be specified in the official course entry and notified to each student at the beginning of the semester.

40.20 The School of Graduate Studies shall monitor the progress of graduate students by means of semester reports to be submitted by the Supervisor to the School of Graduate Studies Board through the Departmental Board.

40.21 The Dissertation, Research Essay or Thesis must be based on original research carried out by the student. Submission of work that is copied entirely or in part from another source is not acceptable and will result in an assessment of "Fail".

40.22 A graduate student who is not making satisfactory progress in his/her programme may be advised by the Department and the School of Graduate Studies Board to withdraw.

40.23 A full time graduate student may be employed parttime, provided that the maximum number of hours does not exceed twenty contact hours per week. A graduate student who is employed for more than twenty hours per week would normally be accepted for registration on a part-time basis.

40.24 A graduate student may not accept any sponsorship that places any restrictions on the presentation of the Dissertation, Research Essay, or Thesis, or the deposition of these documents in the University Library or other libraries.

40.25 The School of Graduate Studies Handbook for graduate students shall be used as a guideline forimplementation and operation of the Masters and Doctoral degree programmes, based on these Academic Regulations.

40.26 The School of Graduate Studies Board may terminate studies for a graduate student who fails, without valid reason, to comply with registration requirement.

41.0 General Regulations Specific for Master's Degree Programmes

Preamble

The Masters degrees are postgraduate degrees which are earned through successful completion of course work or through a combination of course work and research. Masters degree programmes may be available through all Faculties and Departments, through the School of Graduate Studies. Supervisory and research arrangements will be determined in the Departments and require approval of the School of Graduate Studies. It is not essential that the Masters degree be pursued in the same Faculty as the Bachelors degree was obtained, but normally the subject for study in the higher degree shall have been a major subject taken successfully at the Bachelors level. If the Bachelors degree

has been earned in a different academic discipline, the student may be required to meet additional academic requirements.

41.1 The Masters degrees programmes shall be specified in the Programme and Faculty Regulations and shall be offered in one of the following modes:

(a) Course work and either Dissertation or

Research Essay

(b) Course work only.

41.2 Applicants who wish to pursue a Masters Programme by research only must apply for admission for the MPhil degree. See Regulation 50.0

41.3 Entrance Qualifications

41.3.1 The normal minimum entrance requirement shall be a Bachelors degree of this or any other recognized University or equivalent institution with at least a second class, second division or equivalent (3.0 GPA, on a 5-point scale) in the relevant field.

41.3.2 Candidates with a Pass degree or equivalent, and who have at least two years of relevant work experience, may be considered for provisional admission. After successful completion of 2 semesters of full-time academic work or 24 credits of part-time work, the student will be considered to be in good academic standing.

41.3.3 Applicants who have completed a postgraduate diploma are eligible for admission into a relevant Masters programme. The number of credits to be allowed towards the Masters will be assessed on admission.

41.3.4 Subject to the approval of the Departmental Board and the School of Graduate Studies, students seeking to transfer from another recognized institution may be credited with up to a maximum of one-third of the total number of credits required for the programme. A transfer student must meet existing Departmental and Faculty pre-requisites for the intended programme of study.

41.4 Application for Admission

41.4.1 Applications may be received from February-April each year for applicants wishing to enrol in August of the same year and from September-October for applicants wishing to enrol in January of the following.

41.4.2 A prospective applicant is advised to discuss his/her proposed programme with the Department before applying.

41.4.3 On receipt of completed application forms and supporting documents, the School of Graduate Studies shall send one copy to the relevant Head of Department for review and recommendation.

41.4.4 Acceptances/Rejections shall be processed by the School of Graduate Studies Board after receipt of the recommendation of the Departmental Board.

41.4.5 Each applicant shall be notified of the result ofhis/her application by the School of Graduate Studies. Successful applicants should then proceed to register as directed. A graduate student is expected to begin study for the Masters degree within one calendar year from the date the application is approved.

41.4.6 Students who have failed a programme are eligibleto reapply to that programme after one academic year.

41.5 Programme Structure

The curriculum for the Masters degree programmes shall be specified in Departmental and Faculty Regulations.

41.5.1 Duration of the Programme

The normal duration for a student in a Mastes programme shall be as follows:

a) A minimum of 3 to a maximum of 6 semesters on a full-time basis
b) A minimum of 4 to a maximum of 12 semesters on a part-time basis. Under no circumstances can the duration of study be longer than 12 semesters.

41.6 Registration

41.6.1 The normal workload for a full-time Masters student shall be 12 credits. A full-time student may register for 9-15 credits per semester, unless specified otherwise in Departmental or Faculty Regulations. The normal work load for part-time Masters students shall be 6-9 credits per semester.

41.6.2 To be awarded a Masters degree, a candidate must complete a minimum of 36 credits and complete all work as specified in Programme and in Course Outlines.

41.6.3 Students who have full-time employment must register as part time students.

41.7 Assessment

41.7.1 Continuous Assessment

Continuous Assessment shall be as prescribed in General Regulation 0.81.

41.7.2 Where the assessment includes final examinations, such examinations shall be held within the semester in which the course was taught, and Academic General Regulation 00.82 shall apply.

41.7.3 In any course, the weighting between different components of assessment shall be specified in the programme regulations and in General Regulation 00.84.1.

41.7.4 Overall performance in a course shall be assessed according to General Regulation 00.84.3 on a percentage scale, a Letter Grade and/or a Grade Point as follows:

Marks (%)	Letter Grade	Grade Point
80 - 100	A	5.0
75 - 79.9	B+	4.5
70 - 74.9	B	4.0
65 - 69.9	B_	3.5
60 - 64.9	C+	3.0
55 - 59.9	C	2.5
50 - 54.9	FG	2.0
45 - 49.9	FG	1.5
40 - 44.9	FG	1.0
35 - 39.9	FG	0.5
0- 34.9	FG	0

Explanation of grades: FG (Failing Grade), I (Incomplete). Grades that may be used for research courses also include: P (Progress) and U (Unsatisfactory).

41.7.5 Passing a course means obtaining a mark of at least 55 percent (C or 2.5 on a 5 point grade scale)

41.7.6 A student, who for reasonable cause, has been unable to complete course work, a Research Essay or Dissertation, may, in writing, request an extension of up to a maximum of twelve months. The Departmental Board will review the request and forward a recommendation to the School of Graduate Studies. All course work, Research Essays and Dissertations must be completed within the allocated time period.

41.7.7 The cumulative GPA shall be calculated in accordance with General Regulation 00.86.

41.8 Progression from Semester to Semester

41.8.1 To proceed to the next semester, a student must have a cumulative GPA of 2.5 or above.

41.8.2 A student who has failed not more than one course each semester with a mark of at least 40 and has a cumulative GPA of not less than 2.0 may register for the next semester on Probation, unless specified otherwise in Departmental or Faculty Regulations. However, such a student will be permitted to retake a failed course only once in subsequent semesters. A student on Probation shall be required to achieve a cumulative GPA of at least 2.5 at the end of the next semester in order to be eligible to continue in the programme.

41.8.3 Students are permitted to retake a failed course only once. All Core courses must be passed. A failed Optional course with a grade 0f at least 40 percent may be replaced by another Optional course, which must be passed.

41.8.4 A student who has failed more than one course in a semester will have failed the programme.

41.9 Dissertation

41.9.1 The Dissertation Supervisor shall normally be nominated by Department before the completion of coursework. Such a supervisor shall normally be a member of academic staff in the department in which the research is being pursued, or with the approval of the School of Graduate Studies, the supervisor may be from another department or appropriate external institution. The Department shall nominate up to 2 additional members who shall be Co-supervisors, who with the Supervisor shall constitute a Supervision Committee.

41.9.2 In exceptional circumstances, a change of Supervisor may be requested by the student and/or recommended by the Departmental Board to the School of Graduate Studies Board.

41.9.3 Where a Supervisor is absent from the University for more two months, an acting Supervisor must be appointed. The Supervisor shall make the recommendation of an acting Supervisor to the Department for approval by the School of Graduate Studies.

41.9.4 The normal weight of a Dissertation shall be 24 credits.

41.9.5 The Length of the Dissertation shall normally be 20,000 to 40,000 words (excluding footnotes, tables and appendices

41.9.6 The Format of the Dissertation shall be according to directions provided to the student by the School of Graduate Studies.

41.9.7 The Dissertation shall normally be submitted within two semesters for full-time students and four semesters for part-time students, after the semester during which course work was completed.

41.9.8 In cases where the Supervisor has not approved the submission of the Dissertation for examination, but all other procedures have been met, the candidate may submit the Dissertation to the School of Graduate Studies for examination without the Supervisors approval, through the supervision committee and following an appeal to the Departmental Board.

41.10 Research Essay

41.10.1 The Research Essay Supervisor shall normally be nominated by the Department before the completion of course work. Such a Supervisor shall normally be a member of academic staff in the department in which the research is being pursued, or with the approval of the School of Graduate Studies, the supervisor may be from another department or appropriate external institution. The Department shall nominate up to 2 additional members who shall be Co-Supervisors, who with the Supervisor shall constitute a Supervision Committee.

41.10.2 In exceptional circumstances, a change of Supervisor may be recommended by the Departmental Board to the School of Graduate Board.

41.10.3 Where a Supervisor is absent from the University for more than two months, an acting supervisor must be appointed. The Supervisor shall make the recommendation of an acting Supervisor to the Department for approval by the School of Graduate Studies.

41.10.4 The normal weight of a Research Essay shall be 12 credits.

41.10.5 The length of a Research Essay shall normally be 10,000 to 20,000 words (excluding footnotes, tables and appendices).

41.10.6 The format of the Research Essay shall be according to direction(s) the student by the School of Graduate Studies.

41.10.7 The Research Essay shall normally be submitted within 6 months for full-time students and 12 months for part time students, from the date that School of Graduate Studies approves the final coursework marks.

41.10.8 In cases where the Supervisor has not approved the submission of the Research Essay for examination, but all other procedures have been met, the candidate may submit the Research Essay to the School of Graduate Studies without the Supervisors approval, through the committee, and following an appeal to the Departmental Board.

41.11 Examination of a Dissertation or Research Essay

41.11.1 On the recommendation of the Departmental Board, the School of Graduate Studies shall normally appoint an Internal Examiner (who shall not be the Supervisor) and an External Examiner.

41.11.2 Subject to Departmental and Faculty regulations, a student shall give two months notice to the Head of Department and the Dean of the School of Graduate Studies of the date of submission of the Dissertation or Research Essay, together with its final title.

41.11.3 A student shall submit three loose-bound copies of the Dissertation/ Research Essay, accompanied by a covering letter signed by the Supervisor indicating his or her approval, or otherwise, to the School of Graduate Studies for examination by Internal and External Examiners; the Dean of the School of Graduate Studies shall retain one copy.

41.11.4 The examiners shall each submit a signed report to the Dean of the School of Graduate Studies stating whether the Dissertation or Research essay is:

a) Accepted and passed;
b) Accepted pending minor amendments;
c) Referred for major amendments; or
d) Failed.

41.11.5 The completion of required minor amendments to the Dissertation or Research essay shall be coordinated by the Supervisor and certified the External Examiner.

41.11.6 If the Dissertation or Research Essay has been referred for major amendments, it is the responsibility of the Supervisor to determine that the candidate has made all the corrections recommended by the Examiners. Major amendments shall then be approved by the External Examiner. A Dissertation which has been referred for amendment shall be resubmitted only once, and this must be done within a period of twelve months. A Research essay which has been referred for amendment shall be resubmitted only once, and this must be done within a period of six months.

41.11.7 In the case of conflicting reports from Examiners or in borderline cases the Department may request and recommend a third Examiner to the School of Graduate Studies.

41.11.8 Once the Dissertation or Research Essay has been accepted by the Examiners, the Department Board shall recommend the award of the degree. The recommendation, with the results of the coursework and Dissertation/ Research Essay, shall be submitted by the Departmental Board to the School of Graduate Studies and Senate, and the decision of Senate communicated immediately to the student.

41.11.9 Following approval by Senate, the student is responsible for submitting at least five bound copies under the Legal Deposit Act. Of the five copies, the relevant department, the UB Library, and the National Botswana Archives will get one copy each; the student will get two copies. The Supervisor and Co-Supervisor will receive copies which may have bound at their own expense.

41.12 Notification of results and award of the Master's degree

41.12.1 Candidates will be notified of their examination results by the School of Graduate Studies only after the reports from the External and Internal Examiners, Departmental Board and School of Graduate Studies Board have been accepted and approved by the Senate.

41.12.2 The award of the Masters degree under the seal of the University shall be delivered to each successful candidate after the award of the degree has been approved by the Senate.

41.12.3 A student normally has the right of appeal to Senate on decisions taken under these regulations. Appeal is made to the Dean of the School of Graduate Studies, for consideration by the Departmental Board and the School of Graduate Studies Board, within three months from the date of notification of the results. The appeals procedure shall appear in the Graduate Students Handbook.

41.12.4 The Master's degree shall not be classified.

50.0 General Regulations for the Degrees of Masters of Philosophy (MPhil) and Doctor of Philosophy (PhD)

Preamble

The MPhil and PhD degrees are graduate degrees carried out through supervised research, but which may require coursework if deemed necessary by the Departmental Board. Courses to fulfil such requirements must be approved by the Departmental Board, the School of Graduate

Studies and Senate. These degrees may be available through all Faculties and Departments, through the School of Graduate Studies. Further studies, research and supervisory arrangements will be determined in the Departments and require approval of the School of Graduate Studies Board.

It is not essential that these degrees be pursued in the same Faculty as the Bachelors degree was obtained, but normally the subject for study in the higher degree shall have been a major subject taken successfully at the Bachelors level. If the Bachelors degree has been earned in a different academic discipline, the student may be required to meet additional academic requirements.

50.1 Admission into the Master of Philosophy Degree Programme

50.1.1 Normally applicants must have obtained an appropriate single major or Honours degree with a First or Upper Second Class (overall A or B average GPA of3.5 on a 5 point scale) from a recognised University or equivalent Institution of Higher Education or a Masters degree.

50.1.2 Applicants who have obtained an appropriate combined major degree with a First or Second Class (overall A or B average) may be considered provided that, at least, an Upper Second Class performance (B average) is achieved in the intended field of study.

50.1.3 Applicants who have obtained other qualifications and have relevant experience may be considered by the School of Graduate Studies Board on the recommendation of the appropriate Departmental Board. Applicants may be required to pass a qualifying examination, set and organised by the Department concerned, who shall forward the results to the School of Graduate Studies Board through the Departmental Board before a final decision on the applicants acceptability is made.

50.1.4 Applications must also conform to all relevant Programme and Faculty Regulations and must include an acceptable preliminary research Proposal.

50.2 Admission into the Doctor of Philosophy Degree Programme

50.2.1 Applicants who have obtained an appropriate Masters Degree (MSc, MA, MEd, MPhil or equivalent) with course work and research are eligible to apply.

50.2.2 a) Subject to paragraph "d", applicants shallnormallybeadmittedintoanMPhilprogramme.

b) After completion of a maximum of two semesters of full-time academic work (or the equivalent) the programme shall recommend the student either for transfer to the PhD programme or for continuation as an MPhil candidate.

c) When transfer to the PhD programme occurs, the credits accumulated as an MPhil student shall be applied toward the 72 credits required for completion of the PhD degree.

d)Applicants with previous research experience may be admitted directly into the PhD programme, upon recommendation of the Departmental Board and approval by the School of Graduate Studies.

50.2.3 A prospective applicant must first discuss the proposed programme with the department in which (s)he proposes to work, to establish in general terms whether the research proposal is viable.

50.2.4 On receipt of completed application forms and supporting documents, including an acceptable outline of the proposed research, the School of Graduate Studies shall send one copy to the relevant Head of Department for review and recommendation.

50.2.5 Acceptances/Rejections shall be considered by the School of Graduate Studies Board after receipt of the recommendation of the Departmental Board and verification that a qualified Supervisor is available.

50.2.6 Each applicant shall be notified of the result of his /her application by the School of Graduate Studies. Successful applicants should then proceed with registration. A graduate student is expected to begin study for the MPhil or PhD degree within one calendar year from the date the application is approved.

50.3 Registration

50.3.1 Retroactive registration will not normally be permitted. All registration must be finalized by the end of the third week of the semester.

50.3.2 The normal work load for a full-time MPhil or PhD student shall be 12 credits each semester. A fulltime student may register for 9 - 15 credits per semester, unless specified otherwise in Departmental or Faculty Regulations. The normal work load for part-time students shall be 6 - 9 credits per semester.

50.3.3 Students who have full-time employment must register as part-time students.

50.4 Transfer from another University

50.4.1 Transfer to an MPhil at UB from another recognized University or equivalent Institution of Higher Education may be considered by the School of Graduate Studies Board on production of satisfactory documentation and references. No more than one-third of the total number of credits required for the programme can be credited from study at another university.

50.5 Duration of the Programme.

50.5.1 Master of Philosophy Degree

The normal duration of the MPhil Degree Programme shall be as follows:

a) A minimum of 2 semesters and a maximum of 6 semesters on a fulltime basis
b) A minimum of 4 semesters and a maximum of 12 semesters on a part-time basis
c) Under no circumstances can the duration of study be greater than 12 semesters.
During this time the student shall register for and complete 24 credits of Thesis research.

50.5.2 Doctor of Philosophy Degree

The normal duration of the PhD Degree programme shall be as follows:

a) A minimum of 6 semesters and a maximum of 8 semesters on a fulltime basis

b) A minimum of 8 semesters and a maximum of 16 semesters on a part-time basis

c) Under no circumstances can the duration of study be greater than 16 semesters
During this time the student shall register for and complete 72 credits of Thesis research.

50.5.3 If a reduction or extension of registration outside the normal period is required, a written application must be submitted through the Supervisor and the Departmental Board to the School of Graduate Studies Board, which may grant an extension of up to twelve months. Any reduction or further extension may only be approved by the School of Graduate Studies Board. Under certain circumstances, the School of Graduate Studies Board may only

grant such permission if the student agrees to transfer to regulations current at that time.

50.6 Programme of Study

50.6.1 Each graduate student is required to pursue a prescribed programme of study under the direction of a Supervisor.

50.6.2 The Supervisor shall be recommended by the Departmental Board, and shall be approved and appointed by the School of Graduate Studies Board. With approval of the School of Graduate Studies, the Department shall nominate up to two additional members who shall act as Co-Supervisors, who with the Supervisor shall constitute a Supervision Committee. In approving the Supervision Committee, the School of Graduate Studies shall take into account the overall expertise and experience of the proposed team.

50.6.3 Co-Supervisors from within or outside the University of Botswana may be recommended by the Departmental Board, and shall be approved and appointed by the School of Graduate Studies Board which, before reaching a decision, will examine the respective CVs for evidence of an appropriate level of experience and/or current scholarly work.

50.6.4 In exceptional circumstances, a change of Supervisor may be recommended by the Departmental Board to the School of Graduate Studies Board.

50.6.5 Where a Supervisor is absent from the University for more than two months, then an acting Supervisor must be appointed. The supervisor shall make the recommendation of an acting Supervisor to the Department for approval by the School of Graduate Studies.

50.6.6 At the beginning of the students programme of study, there shall be a written statement prepared which identifies the expectations the Supervisor has of the student and which the student has of the Supervisor.

50.7 Transfer of Registration

50.7.1 Transfer from MPhil to PhD

50.7.1.1 A candidate provisionally registered for the PhD degree shall apply to transfer registration and proceed to the PhD, after completion of at least a period of 9 months but not more than 24 months (full-time students) or at least 9 but not more than 36 months (part-time students), if the Supervisor so recommends. The recommendation shall be based on the work that has already been done by the student within the said period. The application must then be supported by a statement from the Supervisor describing progress and giving details of how the study is to be developed. The application must be submitted through the Departmental Board to the School of Graduate Studies Board for final decision.

50.7.2 Transfer from PhD to MPhil

50.7.2.1 A candidate registered for the PhD, may choose to transfer to the MPhil programme. The students Supervisor may recommend that the student transfer to the MPhil programme. In both of these situations, the application for transfer must be accompanied by a written recommendation from the Supervisor and be submitted through the Departmental Board to the School of Graduate Studies Board for final decision.

50.7.2.2 When the Supervisor recommends that the student transfer to the MPhil programme and the student does not wish to do so, the student will be required to withdraw.

50.8 Thesis

50.8.1 Submission of Title and Abstract of the Thesis The title and abstract (not exceeding 500 words) of the Thesis must be submitted through the Supervisor and the Departmental Board for approval by the School of Graduate Studies Board approximately three months before submission of the Thesis. After the title has been approved, it may not be changed except with the permission of the Department and the School of Graduate Studies Board. The abstract may be edited before the final submission of the thesis.

50.8.2 Format and Content of the Thesis

50.8.2.1 The Thesis must be written in English. Exceptions may be made when an exception is requested, approval of the School of Graduate Studies Board shall be obtained at the time of original admission. Any thesis which is not written in English must be accompanied by an English language abstract and synopsis.

50.8.2.2 An MPhil Thesis must provide evidence of sound scholarship and constitute an original contribution to the advancement of knowledge in the subject chosen. It should demonstrate that the candidate has mastered relevant research techniques for collecting, analysing and interpreting data acquired a wide knowledge and understanding of literature in the field of study developed a capacity for critical appraisal of existing facts, ideas and theories and is capable of producing a treatise through the analysis and synthesis of the relevant data, concepts and theories.

50.8.2.3 A PhD Thesis should show the same attributes as mentioned in the case of an MPhil Thesis, except that its contribution to knowledge should be original and substantial, and that it will demonstrate evidence of a greater depth of scholarship than that required for the MPhil degree.

50.8.2.4 The length of the MPhil Thesis shall normally be approximately 60,000 words, and that for the PhD Thesis shall normally be approximately 100,000 words, excluding notes, appendices, bibliography and references. The Thesis must consist of the candidates own account of the research. The Thesis may describe work carried out in conjunction with the candidates Supervisors, and others. It may also include material obtained or produced with technical or other assistance, provided that the candidates personal share in the investigation is stated clearly, and specifically acknowledges all such assistance. Publications and other contributions (e.g. reports) may be submitted, provided they are published solely by the candidate, or if jointly, the candidate must state fully his/her contribution to the work.

50.8.2.5 The Thesis may be submitted in the format specified in the Graduate Students Handbook or as a collection of papers published in peerreviewed journals or books, provided the overall Thesis forms a logical and linked development of ideas.

50.8.2.6 It is not permitted to present a Thesis that has been submitted to another University or Institute of Higher Education for an award except by written agreement between the two institutions at the beginning of the study.

50.8.3 Submission of the Thesis for Examination

50.8.3.1 After completing the research/investigation, the candidate will be required to lodge with the Dean of School of Graduate Studies three loosely bound copies of the Thesis for examination.

509 Examination

50.9.1 Entry into the Examination

50.9.1.1 Application for entry to the examination must be made on the appropriate form obtainable from the Dean of School of Graduate Studies. The examination entry form shall be endorsed by the Supervisor, who shall first satisfy himself/ herself that the Thesis is in a form suitable for examination and, if items of coursework have been set, that the candidate has satisfactorily completed them. The completed form must be returned with the prescribed fee to the School of Graduate Studies.

50.9.1.2 The final submission of the Thesis for examination may follow at any time within the permitted time limit, but the candidate must immediately beforehand inform the Departmental Board and School of Graduate Studies Board in writing of the intention to do so, and also submit a signed statement from the Supervisor indicating his/her approval or otherwise, to the submission of the Thesis for examination.

50.9.1.3 In cases where the Supervisory Committee has not approved the submission of the Thesis for examination, but all other procedures have been met, the candidate may submit the Thesis to the School of Graduate Studies without the Supervisors approval, through the supervision committee, after a successful appeal to the Departmental Board.

50.9.1.4 For the purpose of the oral, practical or written examinations held in connection with the Thesis, the candidate is required to be present at such place as the University may direct and upon such day or days, as are notified.

50.9.2 Appointment and Functions of Internal Examiners

50.9.2.1 There shall be one External Examiner and one Internal Examiner appointed by School of Graduate Studies Board on the recommendation of the Departmental Board. In the exceptional event that no suitable Internal Examiner is available from within the University, a Second External Examiner in lieu shall be appointed.

50.9.2.2 The External Examiner and the Internal Examiner(s) shall be members of the Board of Examiners whose functions are outlined in Regulation 50.9.4.

50.9.3 Board of Examiners

50.9.3.1 Composition of the Board of Examiners The Board of Examiners for the degree of MPhil and PhD shall comprise at least three members from the following, as recommended by the Departmental Board and approved by the School of Graduate Studies Board.

Chairperson: A Professor or Senior Academic normally from a different department of the relevant faculty, provided s/ he is not a member of the Supervision Committee.

Internal Examiner: An academic member of staff who is competent in the area of the work to be examined. In the exceptional event that no suitable Internal Examiner is available from within the University, a Second External Examiner in lieu shall be appointed.

NOTE:

a) The MSc degree programme will be by course work and dissertation for both full-time and part-time programmes

b) Part time students register for a total of six credit hours per semester (ie, one three credit hour optional course and one three credit hour core course) in semesters 1 to 4

c) A student can take an optional course from any of the following departments.
**AEL Agricultural Engineering and Land Planning
CSP - Crop Science and production
ASP - Animal Science & Production

DEPARTMENT OF AGRICULTURAL ECONOMICS, EDUCATION & EXTENSION (AEE)

Preamble

The MSc programme in Agricultural Education and Extension shall be conducted in accordance with the Graduate School General Academic Regulations.

Programme Structure of the MSc in Agricultural Education

Programme Structure (Full Time)

Semester 1

Core Courses

AEE601: Administration and Supervision of Agricultural Education Programmes (3 credits)
AEE 603: Educational Statistics (3 credits)
AEE605: Curriculum Studies in Agricultural Education (3 credits)
Optional Courses (take at least one course)
AEE607: Psychology of Learning in Agricultural Education (3 credits)
OR
AEE609: Agricultural Educational Programme Planning and Evaluation (3 credits)
OR
****AEL/CSP/ASP** (3 credits)
Total (12 credits)

Semester 2

Core Courses

AEE602: Research Methods in Education(3 credits)
AEE604: Seminars Series in Agricultural Education (3 credits)
AEE606: Measurement and Testing in Agricultural Education (3 credits)
Optional Courses (take at least one course)
AEE608: Adult Education in Agriculture (3 credits)
OR
AEE 610: Comparative Agricultural Education (3 credits)
OR
AEE612: Educational Communications and Technology (3 credits)
OR
****AEL/CSP/ASP** (3 credits)
Total 12 credits)

Semesters 3 & 4

AEE 700: MSc Dissertation (24 credits) Total Credits for the MSc Degree in Agricultural Education (48 credits)
Programme Structure (Part Time).

Semester 1

Core Courses

AEE601: Administration and Supervision of Agricultural Education Programmes (3 credits)
AEE603: Educational Statistics (3 credits)
AEE605: Curriculum Studies in Agricultural Education (3 credits)
Optional Courses (take at least one course)
AEE607: Psychology of learning in Agricultural Education (3 credits)
OR
AEE609: Agricultural Educational Programme Planning and Evaluation (3 credits)
OR
****AEL/CSP/ASP** (3 credits)
TOTAL (6 credits)

Semester 2

Core Courses

AEE602: Research Methods in Education 3credits)
AEE604: Seminars Series in Agricultural Education (3 credits)
AEE606: Measurement and Testing in Agricultural Education (3 credits)
Optional Courses (take at least one course)
AEE608: Adult Education in Agriculture (3 credits)
OR
AEE610: Comparative Agricultural Education (3 credits)
OR
AEE612: Educational Communications and Technology (3 credits)
OR
****AEL/CSP/ASP** (3 credits)
Total (6 credits)

Semesters 3

Core Courses

AEE601: Administration and Supervision of Agricultural Education Programmes(3 credits)
AEE603: Educational Statistics (3 credits)
AEE605: Curriculum Studies in Agricultural Education (3 credits)
Optional Courses (take at least one course)
AEE607: Psychology of learning in Agricultural Education (3 credits)
OR
AEE609: Agricultural Educational Programme Planning and Evaluation (3 credits)
OR
****AEL/CSP/ASP** (3 credits)
Total (6 credits)

Semester 4

Core Courses

AEE602: Research Methods in Education(3 credits)
AEE604: Seminars Series in Agricultural Education 3 credits)
AEE606: Measurement and Testing in Agricultural Education (3 credits)
Optional Courses (take at least one course)
AEE608: Adult Education in Agriculture (3 credits)
OR
AEE610: Comparative Agricultural Education (3 credits)
OR

AEE612: Educational Communications and Technology (3 credits)
OR
**AEL/CSP/ASP (3 credits)
Total (6 credits)

Semesters 5 and 6

AEE700: MSc Dissertation (24 credits)

COURSE SYNOPSIS

AEE601: Administration and Supervision of Agricultural Education Programmes The course emphasizes the principles and practices of administration and supervision in agricultural educational institutions.

AEE602: Research Methods in Education The course will cover principles and practices related to scientific studies in agricultural education. The course will emphasise on research designs, instrumentation, data collection procedures, data analysis, surveys, relationships and co-relational studies including ex-post factor.

AEE603: Educational Statistics The course covers descriptive and inferential statistics and the choice and use of appropriate computer programmes to analyse data as applied to agricultural education research.

AEE604: Seminars Series in Agricultural Education This course is designed to identify issues and problems and opportunities in agricultural education in Botswana, sub-Saharan Africa and in the world at large.

AEE605: Curriculum Studies in Agricultural Education

The course covers the process of planning and designing an agricultural education course. This course meets the needs of those who are/will be involved in curriculum planning and development in formal and non-formal agricultural education programmes

AEE606: Measurement and Testing inAgricultural Education The course emphasises the principles and practices of measurement and testing, in agricultural education.

AEE607: Psychology of learning in Agricultural Education The course covers the major theories and practices of learning and their implications for educational practice in agricultural education.

AEE608: Adult Education in AgricultureThe course emphasises adult education theoriesand practices, inter-relationship between adulteducation and agricultural education, adult literacy programmes; appraisal of adult education activities and programmes; the philosophy of adult education; and developmental issues in adult education.

AEE609: Agricultural Educational Programme Planning and Evaluation This course will emphasize the principles and practices in programme planning and evaluation in agricultural education.

AEE610: Comparative Agricultural Education This course covers a comparative analysis of agricultural education programmes in selected sub-Sahara African countries and in the rest of the world.

AEE612: Educational Communications and Technology The course covers communication models and media used in specific contexts in agricultural education and the role of instructional technology in learning and teaching in agriculture.

DEPARTMENT OF AGRICULTURAL ENGINEERING AND LAND PLANNING (AEL)

Preamble

The MSc programme in Agricultural Engineering shall be conducted in accordance to the Graduate School General Academic Regulations.
Programme Structure of the MSc in Agricultural Engineering

MECHANIZATION STREAM (FULL TIME)

Semester 1

Core Courses
AEL601: Machine Elements Design (3 credits)
AEL603: Turbo Machinery (3 credits)
AEL605: Engineering Statistics (3 credits)
Optional Courses (take at least one course)
AEL607: Simulation and Modelling (3 credits)
OR
AEL609: Systems Engineering in Agriculture (3 credits)
OR
AEL611: Occupational Safety and Health in Agriculture (3 credits)
Total 12 credits)

Semester 2

AEL600: Soil Tillage and Traction (3 credits)
AEL602: Data Acquisition and Control (3 credits)
Optional Courses (take at least one course)
AEL604: Postharvest Handling and Storage (3 credits)
OR
AEL606: Solar Energy Utilization (3 credits)
Optional Courses (take at least one course)
AEL608: Precision Farming (3 credits)
OR
AEL624: Geographical Information Systems (3 credits)
OR
AEL 626: Remote Sensing (3 credits)
Total (12 credits)

Semesters 3 & 4

AEL701: Research Proposal (6 credits)
AEL702: Research and Dissertation (18 credits)
Total (24 credits)

LAND USE PLANNING STREAM (FULL TIME)

Semester 1

Core Courses
AEL605: Engineering Statistics (3 credits)
AEL621: Land Resource Planning (3 credits)
AEL623: Soil and Water Conservation (3 credits)
Optional courses (take at least one course)
AEL625: Agricultural Waste Management(3 credits)
OR
AEL607: Simulation and Modelling (3 credits)
OR
AEL609: Systems Engineering in Agriculture (3 credits)
Total (12 credits)

Semester 2

Core courses
AEL602: Data Acquisition and Control (3 credits)
AEL622: Land Evaluation (3 credits)
Optional Courses (take at least one course)
AEL624: Geographical Information Systems (3 credits)
OR
AEL626: Remote Sensing (3 credits)
Optional Courses (take at least one course)
AEL636: Climate and Resources in Semi-arid Environments (3 credits)
OR
AEL638: Hydrology and Water Resources (3 credits)
Total 12 credits)

Semesters 3 & 4

Core Courses
AEL701: Research Proposal (6 credits)
AEL702: Research and Dissertation (18 credits)
Total (24 credits)

SOIL & WATER ENGINEERING STREAM (FULL TIME)

Semester 1

Core Courses
AEL605: Engineering Statistics (3 credits)
AEL631: Irrigation Systems Design (3 credits)
AEL634: Hydraulic Structures (3 credits)
Optional Courses (take at least one course)
AEL607: Simulation and Modelling (3 credits)
OR
AEL633: Agricultural Water Management (3credits)
OR
AEL635: Design of Concrete Structures (3 credits)
Total (12 credits)

Semester 2

Core Courses
AEL602: Data Acquisition and Control (3 credits)
AEL632: Land Drainage and Reclamation (3credits)
Optional Courses (take at least one course)
AEL624: Geographical Information Systems (3 credits)
OR
AEL626: Remote Sensing (3 credits)
Optional Courses (take at least one course)
AEL636: Climate and Resources in semi-arid invironments (3 credits)
OR
AEL638: Hydrology and Water Resources(3credits)
Total (12 credits)

Semesters 3 & 4

Core Courses
AEL701: Research Proposal (6 credits)
AEL702: Research and Dissertation (18 credits)
Total (24 credits)

MECHANIZATION STREAM (PART TIME)

Semester 1

Core Courses
AEL601: Machine Elements Design (3 credits)
AEL605: Engineering Statistics (3 credits) Total (6 credits)

Semester 2

Core Course
AEL602: Data Acquisition and Control (3 credits)
Optional Courses (take at least one course)
AEL 608: Precision Farming (3 credits)
OR
AEL624: Geographical Information Systems (3 credits)
OR
AEL626: Remote Sensing (3 credits) Total (6 credits)

Semester 3

Core course
AEL603: Turbo Machinery (3 credits)
Optional Courses (take at least one course)
AEL607: Simulation and Modelling (3 credits)
OR
AEL609: Systems Engineering in Agriculture (3 credits)
OR
AEL611: Occupational Safety and Health in Agriculture (3 credits)
Total (6 credits)

Semester 4

Core Course
AEL600: Soil Tillage and Traction (3 credits)
Optional Courses (take at least one course)
AEL604: Postharvest Handling and Storage (3 credits)
OR
AEL606: Solar Energy Utilization (3 credits)
Total (6 credits)

Semesters 5 & 6

Core Courses
AEL701: Research Proposal (6 credits)
AEL702: Research and Dissertation (18 credits)
Total (24 credits)

LAND USE PLANNING STREAM (PART TIME)

Semester 1

Core Course
AEL605: Engineering Statistics (3 credits)
AEL621: Land Resource Planning (3 credits)
Total (6 credits)

Semester 2

Core Course
AEL602: Data Acquisition and Control (3 credits)
Optional Courses (take at least one course)
AEL624: Geographical Information Systems (3 credits)
OR
AEL626: Remote Sensing (3 credits)
Total (6 credits)

Semester 3

Core Course
AEL623: Soil and Water Conservation (3 credits)
Optional Courses (take at least one course)
AEL 607: Simulation and Modelling (3 credits)
OR
AEL 609: Systems Engineering in Agriculture (3 credits)
OR
AEL625: Agricultural Waste Management (3credits)
Total (6 credits)

Semester 4

Core Course
AEL622: Land Evaluation (3 credits)
Optional Courses (take at least one course)
AEL636: Climate and Resources in Semi-arid Environments (3 credits)
OR
AEL638: Hydrology and Water Resources(3credits)
Total (6 credits)

Semesters 5 & 6

Core Courses
AEL701: Research Proposal (6 credits)
AEL702: Research and Dissertation (18 credits)
Total (24 credits)

SOIL & WATER ENGINEERING STREAM (PART TIME)

Semester 1

Core Course
AEL605: Engineering Statistics (3 credits)
Optional Courses (take at least one course)
AEL607: Simulation and Modelling (3 credits)
OR
AEL633 :Agricultural Water Management (3 credits)
OR
AEL635: Design of Concrete Structures (3 credits)
Total (6 credits)

Semester 2

Core Course
AEL602: Data Acquisition and Control (3 credits)
Optional Courses (take at least one course)
AEL624: Geographical Information Systems (3 credits)
OR
AEL626: Remote Sensing (3 credits)
Total (6 credits)

Semester 3

Core Courses
AEL631: Irrigation Systems Design (3 credits)
AEL637: Hydraulic Structures (3 credits)
Total (6 credits)

Semester 4

Core Course

AEL632: Land Drainage and Reclamation (3credits)
Optional Courses (take at least one course)
AEL636: Climate and Resources in semi-arid Environments (3 credits)
OR
AEL638: Hydrology and Water Resources
Total (6 credits)

Semesters 5 & 6

Core Courses

AEL701: Research Proposal (6 credits)
AEL702: Research and Dissertation (18 credits)
Total (24 credits)

COURSE SYNOPSIS

AEL600: Soil Tillage and Traction

The course covers types of soil engaging tools, soil cutting forces (2 and 3 dimensional cases), soil loosening and manipulation, soil properties and plant growth and traction machines.

AEL601: Machine Elements Design

The application of basic concepts of strength of materials to machine design is developed. Topics include design methods, force analysis, stressstrain, stress concentration and engineering materials. Impact loading together with the design for fatigue is presented. The design of threaded 21 fasteners and springs of various types are also presented. The use of engineering principles in the design of machine components such as traction drives, power screws, belt drives, chain drives, friction brakes, clutches, gears, bearings and lubrication are developed.

AEL602: Data Acquisition & Control

The course covers sensors, measurements, signal conditioning, system response, telemetry, data acquisition, interfacing and control.

AEL603: Turbo Machinery

This course will cover classification and characteristics of fans, pumps and compressors. It will also cover criteria for selection of fans, pumps and compressors for engineering works.

AEL604: Postharvest Handling and Storage

Postharvest losses and techniques to reduce them are discussed with emphasis on handling, packaging and storage factors affecting quality. Discussion also includes types and functions of packaging, environmental issues related to packaging, storage methods of different materials, shelf life studies and distribution systems.

AEL605: Engineering Statistics

The course covers descriptive statistics, basic probability concepts, special statistical distributions, statistical inference-estimation and hypothesis testing, regression, reliability and statistical process control.

AEL606: Solar Energy Utilization

The course covers fundamental solar radiation analysis methods, solar harvesting with flat plate collectors, and use in water heating and electricity production via photovoltaics.

AEL607: Simulation and Modelling

This course covers the basic concepts of simulation and modeling and their application in the solution of typical problems in biosystems engineering. Numerical approaches to be covered include finite element, finite difference, implicit and explicit methods and their application to biosystems engineering solutions in such areas as heat and mass transfer, flow in porous medium and rheological models.

AEL608: Precision Farming

This course covers an overview of precision farming, whole-field vs site specific farming, continuous data sampling, point sampling, data analysis, spatial modeling and current / future trends in technology.

AEL609: Systems Engineering in Agriculture

The course introduces students to the notion of representation of agricultural systems in the form of mathematical or statistical models. These will entail crop growth models, animal production model and agricultural industry resource requirement models.

AEL611: Occupational Safety & Health in Agriculture

The course provides a comprehensive overview of major safety and health hazards in agricultural production and an overview of the basic approaches for the prevention and control of agriculture-related injuries and illnesses.

AEL621: Land Resource Planning

The course covers principles of land resource inventories, land use change dynamics and impacts, current land resource issues, inventory of land resource analytical tools and their applications, integrated land resource management, and resource management case studies.

AEL622: Land Evaluation

The conceptual frameworks for various approaches to land evaluation are outlined, followed by an in depth discussion on land

characteristics and land qualities. Analyses of different resources inventory data for the land evaluation process using computer-based spatial analysis techniques are demonstrated.

AEL623: Soil and Water Conservation

The course is introduced with basic topics of processes and mechanics of erosion and factors influencing it. This is followed by a detailed discussion of erosion assessment techniques at micro, field and regional scales. Experimental techniques for evaluating erosion incidence under different management systems, are treated to some detail at this stage. A general discussion of erosion control by biological and mechanical (including gully control) means is reinforced with integrated topics of environmental impacts of soil conservation policies and legislation, and watershed management.

AEL624: Geographical Information Systems 22

This course covers vector data structures, spatial data capture and input, map projections (and coordinate systems), data conversion, and data analysis.

AEL625: Agricultural Waste Management

The course covers the different agricultural wastes & their characteristics, theory and practice of biochemical and physical processes in waste treatment and composting, waste management systems and design and waste utilization.

AEL626: Remote Sensing

The course covers the applications of remote sensing. These include land cover classification, land cover change detection, vegetation mapping, water quality monitoring, monitoring of atmospheric constituents, lineaments extraction, geological interpretation and height measurement (DEM generation).

AEL631: Irrigation Systems Design

The course covers irrigation as an input to agricultural development, moisture stress in plants, soil water management allowed deficit, crop water requirements, project identification, irrigation systems and irrigation structures.

AEL632: Land Drainage and Reclamation

The course covers benefits of drainage, planning and design of drainage systems, drainage structures and materials, management of saline and alkali soils, salinity control and water table control.

AEL633: Agricultural Water Management

This course covers the principles and common techniques used in water resources management, concepts, definitions, strategic issues, activities and stakeholder-involvement in water resources management, irrigation management techniques and organizational management for irrigation projects.

AEL634: Hydraulic Structures

This course covers storage dams, spillways, outlet and inlet structures, gates and valves, diversion works, drop structures, stone structures, conveyance and control structures, flow measurements and culvert hydraulics.

AEL635: Design of Concrete Structures

The course covers concrete mixtures; concrete reinforcement; concrete masonry and design of various concrete products commonly used in agricultural operations.

AEL636: Climate and Resources in Semi-Arid Environment

The course covers processes of the climate system with particular emphasis on semi-arid environments, specifically Southern Africa. It also covers the link between quaternary climate change and the physical environment, and the impact of men and his activities on the atmosphere and climate resources.

AEL638: Hydrology and Water Resources

This course covers network planning and design, flood and low flow analysis, stochastic models and water resources planning and management. Regulations for Master of Science Degree in Animal Science with Streams in Animal Nutrition, Animal Breeding and Reproduction and Animal Management Systems General regulations 40.0 and 41.0 of the Faculty of Graduate Studies University of Botswana shall apply.

DEPARTMENT OF ANIMAL SCIENCE AND PRODUCTION (ASP)

Preamble

The MSc programme in Animal Science and Production shall be conducted in accordance to the Graduate School General Academic Regulations.

Programme Structure of the MSc in Animal Science

ANIMAL NUTRITION STREAM (FULL TIME)

Semester 1

Core Courses

ASM611: Digestive Physiology and Metabolism (3 credits)
ASM 612: Nutritional Toxicology (3 credits)
BSM 610: Biometry for Animal Scientists (3 credits)
Optional Courses (take at least one course)
ASM 614: Applied Poultry Production (3 credits)
OR
ASM633: Applied Ruminant Nutrition (3 credits)
Total 12 credits)

Semester 2

Core Courses
ASM622: Mineral, Vitamin and Nitrogen Metabolism (3 credits)
ASM623: Carbohydrates, Lipids and Energetics (3 credits)
ASM 624: Regulation of Nutrient Intake (3 credits)
Optional Courses (take at least one course)
ASM625: Applied Pig and Rabbit Management (3 credits)
OR
ASM621: Integrated fodder-livestock production (3 credits)
Total 12 credits)

Semester 3 & 4

ASM700: Proposal Development (6 credits)
ASM701: MSc Dissertation (18 credits)
Total (24 credits)

ANIMAL BREEDING AND REPRODUCTION STREAM (FULL TIME)

Semester 1

Core Courses
ASM615: Population and Quantitative Genetics for Breeding (3 credits)
ASM629: Theriogenology (3 credits)
BSM610: Biometry for Animal Scientists (3 credits)
Optional Courses (take at least one course)
ASM616: Physiology and Endocrinology of Animal Reproduction (3 credits)
OR
ASM617: Comparative Systemic Physiology (3 credits)
Total (12 credits)

Semester 2

Core courses
ASM626: Methodologies for Quantitative and Genetics for Breeding (3 credits)
ASM627: Animal Breeding Strategies (3 credits)
ASM628: Livestock Immunogenetics (3 credits)
Optional Courses (take at least one course)
ASM625: Applied Pig and Rabbit Management (3 credits)
OR
ASM632: Applied Sheep and Goat Management (3 credits)
Total (12credits)

Semesters 3 & 4

ASM700: Proposal Development (6 credits)
ASM701: MSc Dissertation (18 credits)
Total (24 credits)

ANIMAL MANAGEMENT SYSTEMS STREAM (FULL TIME)

Semester 1

Core Courses
ASM618: Cow Calf-Stocker Management(3 credits)
BSM610: Biometry for Animal Scientists (3 credits)
ASM619: Applied Herd Health Management (3 credits)
Optional Courses (take at least one course)
ASM620: Dairy Management Systems (3 credits)
OR
ASM614: Applied Poultry Production (3 credits)
Total (12 credits)

Semester 2

Core Courses
ASM621: Integrated Fodder-Livestock Production System (3 credits)
ASM630: Feedlotting (3 credits)
ASM631: Management and Restoration of Rangelands (3 credits)
Optional Courses (take at least one course)
ASM632: Applied Sheep and Goat Management (3 credits)
OR
ASM625: Applied Pig and Rabbit Management (3 credits)
Total (12 credits)

Semester 3 & 4

ASM700: Proposal Development (6 credits)
ASM701: MSc Dissertation (18 credits)
Total (24 credits)

ANIMAL NUTRITION STREAM (PART TIME)

Semester 1

Core courses
ASM611: Digestive Physiology and Metabolism

(3 credits)
BSM 610: Biometry for Animal Scientists (3 credits)
Total (6 credits)

Semester 2
Core courses
ASM622: Mineral, Vitamin and Nitrogen Metabolism (3 credits)
ASM624: Regulation of Nutrient Intake (3 credits)
Total (6 credits)

Semester 3
Core course
ASM612: Nutritional Toxicology (3 credits)
Optional Courses (take at least one course)
ASM614: Applied Poultry Production (3 credits)
OR
ASM633: Applied Ruminant Nutrition (3 credits)
Total (6 credits)

Semester 4
Core course
ASM623: Carbohydrates, Lipids and Energetics (3 credits)
Optional Courses (take at least one course)
ASM625: Applied Pig and Rabbit Management (3 credits)
OR
ASM621: Integrated fodder-livestock production (3 credits)
Total (6 credits)

Semesters 5, 6, 7 & 8
ASM700: Proposal Development (6 credits)
ASM701: MSc Dissertation (18 credits)
Total (24credits)

Minimum Students-Supervisor contact will be 1 hour per month

ANIMAL BREEDING AND REPRODUCTION STREAM (PART TIME)

Semester 1
Core Courses
ASM615: Population and Quantitative Genetics for Breeding (3 credits)
BSM610: Biometry for Animal Scientists (3 credits)
Total (6 credits)

Semester 2
Core Courses
ASM626: Methodologies for Quantitative Genetics and Breeding (3 credits)
ASM628: Livestock Immunogenetics (3 credits)
Total (6 credits)

Semester 3
Core Course
ASM629: Theriogenology (3 credits)
Optional Courses (take at least one course)
ASM616: Physiology and Endocrinology of Animal Reproduction (3 credits)
OR
ASM617: Comparative Systemic Physiology (3 credits)
Total (6 credits)

Semester 4
Core Course
ASM627: Animal Breeding Strategies (3 credits)
Optional Courses (take at least one)
ASM625: Applied Pig and Rabbit Production (3 credits)
OR
ASM632: Applied Sheep and Goat Management (3 credits)
OR
ASM614: Applied Poultry Production (3 credits)
Total (6 credits)

Semester 5, 6, 7 & 8
ASM700: Proposal Development (6 credits)
ASM701: MSc Dissertation (18 credits)
Total (24 credits)

ANIMAL MANAGEMENT SYSTEMS STREAM (PART TIME)

Semester 1

Core Courses
ASM618: Cow Calf-Stocker Management (3credits)
BSM610: Biometry for Animal Scientists (3 credits)
Total (6 credits)

Semester 2

Core Course
ASM619: Applied Herd Health Management (3 credits)
Optional Courses (take at least one course
ASM620: Dairy Management Systems (3 credits)
OR
ASM614: Applied Poultry Production (3 credits)
Total (6 credits)

Semester 3

Core Courses
ASM630: Feedlotting (3 credits)
ASM631: Management and Restoration of Rangelands (3 credits)
Total (6 credits)

Semester 4

ASM621: Integrated Fodder-Livestock Production System (3 credits)
Optional Courses (take at least one course)
ASM632: Applied Sheep and Goat Management (3 credits)
OR
ASM625: Applied Pig and Rabbit Management (3 credits)
Total (6 credits)

Semesters 5, 6, 7 & 8

ASM700: Proposal Development (6 credits)
ASM701: MSc Dissertation (18 credits)
Total (24 credits)

MPhil/PhD IN ANIMAL SCIENCE

The Department of Animal Science and Production offers Master of Philosophy (MPhil) and Doctor of Philosophy (PhD) in Animal Science. The four streams in the programme are Animal Nutrition, Animal Health, Animal Breeding & Reproduction, and Animal Management Systems. Students will be able to conduct research in their area of specialisation.

The candidates targeted to join the programme will include BSc honours and MSc graduates in Biological Sciences and other related disciplines as per general academic regulation 50.0

COURSE SYNOPSIS

ASM611: Digestive Physiology and Metabolism
This course covers the anatomy of the gastrointestinal tract and manipulations, growth and development of the gut, motility, salivary function and production. Feeding, digestion, absorption, excretion and nutrient metabolism. Research techniques in the digestive systems of animals.

ASM612: Nutritional Toxicology
course will cover the occurrence of heavy metals, mycotoxins, bacterial and fungal contaminants and plant toxins in cereals and forages. The course will also cover the impacts of contaminants on livestock productivity and on the safety of resulting edible products.

BSM610: Biometry for Animal Scientists
The course will cover Completely Randomized Design (CRD), Randomized Complete Block Design (RCBD), Latin Square (LS) and expected mean squares; sample size and power; analysis of covariance; factorial treatments; split plots; repeated measures; multi-location experiments analysis

ASM614: Applied Poultry Production
This course covers nutrition, breeding, hybrid development and marketing practices of poultry production including chicken, ostrich and guinea fowl and its application for improved productivity.

ASM615: Population and Quantitative Genetics for Breeding
An advanced applied course of animal genetics inter alia major genes, gene and genotype frequency, inbreeding, heterosis, linkage analysis, gene mapping and Quantitative Trait Locus (QTL), marker assisted selection and current issues in population genetics which are important in animal breeding

ASM616: Physiology and Endocrinology of Animal Reproduction
This course covers normal reproductive physiological processes and the reproductive endocrinology of the domestic animal species.

ASM617: Comparative Systemic Physiology
This course will cover an integrated comparative study of support and productive body systems in selected animals of economic importance.

ASM618: Cow-Calf and Stocker Management Systems
This course exposes students to two different management systems of cow-calf and stocker systems of beef production that are normally practiced in the beef industry.

ASM619: Applied Herd Health Management
This course covers important infectious and noninfectious diseases/problems in herds / flocks, epidemiological concepts, preventive and control measures, principles of planned herd health programmes and good stock management practices.

ASM620 Dairy Management Systems
This course covers dairy management systems concepts determining how different dairy operations have varying management approaches in terms of resource allocations with regards to capital, land, water, animals, human, health and feed resources. In turn, management decisions determining which system to adopt may be dependent on feed resources available or most prevailing.

ASM621: Integrated Fodder-Livestock Production Systems
This course covers fodder plants, fodder production, harvesting, conservation and marketing. Also, it covers how fodder production can be used to mitigate the influence of drought.

ASM622:Mineral, Vitamin and Nitrogen Metabolism
The course will cover metabolism of macro and trace mineral elements in animal nutrition and principle role of vitamins and proteins.

ASM623: Carbohydrates, Lipids and Energetics
This course covers metabolism of carbohydrates, lipids and energy utilisation by animals including bioenergetics, cellular chemical reactions, factors that regulate

enzyme activity, formation of ATP, electron transport chain, oxidative phosphorylation and anaerobic ATP Production.

ASM624: Regulation of Nutrient Intake

This course covers metabolic and physiological regulation of long and short term nutrient intake in ruminants and non-ruminant animals.

ASM625: Applied Pig and Rabbit Management

This course covers nutrition and management of pigs and rabbits and their application for improved production.

ASM626: Methodologies for Population and Quantitative Genetics

A course on methodologies for population and quantitative genetics applied to livestock improvement inter alia use of statistics in animal breeding, estimation of breeding values, construction of selection indices, use of biotechnology and current issues in animal breeding.

ASM627: Animal Breeding Strategies

A course of animal breeding strategies applied to livestock improvement inter alia prediction of responses to selection, breeding objectives and criteria, pure breeding and crossbreeding, use of biotechnology and current issues in animal breeding strategies.

ASM628: Livestock Immunogenetics

The course will cover the evolution, development, genetic control and application of immunity in farm animals.

ASM629: Theriogenology

The course covers animal reproductive physiological processes, control and manipulation.

ASM630: Feedlotting

This course will cover feedlot establishment, feeding and management of feedlot cattle, pollution control and business aspects of feedlotting.

ASM631: Management and Restoration of Rangelands

This course will cover advanced concepts, theories and practices of rangeland resource management, plant control and restoration

ASM632: Applied Sheep and Goat Management

This course provides students with skills on management systems applied in the sheep and goat industries with the view to increase production per animal to result in sustainable animal agriculture, which preserves the integrity of the environment and conserves bio-diversity.

ASM633: Applied Ruminant Nutrition

This course covers nutritional concepts determining how ruminants feed and handle the feed they have consumed, the digestive differences between them and non-ruminants and how they derive nutrients from the feeds they feed on.

ASM700: Proposal Development

A course in research methodology involving steps in the development of a research proposal for a dissertation.

ASM701 – Dissertation

This is a course that trains students to carry out research according to the proposal developed in ASM 700.

DEPARTMENT OF CROP SCIENCE AND PRODUCTION (CSP)

Preamble

The MSc programme in Crop Science shall be conducted in accordance to the Graduate School General Academic Regulations.

Programme Structure of the MSc in Crop Science

AGRONOMY STREAM (FULL TIME)

Semester 1

Core Courses
CSP601: Eco-Physiology of Crop Plants (3 credits)
CSP603: Cropping Systems (3 credits)
CSP641: Experimental Design (3 credits)
Optional Course (take at least one course)
CSP605: Plant Biotechnology (3 credits)
OR
CSP607: Fibre Crops Production (3 credits)
OR
CSP663: Plant Nutrition (3 credits)
Total (12 credits)

Semester 2

Core Courses
CSP602: Cereal Grain Crops Production (3 credits)
CSP604: Genetic Improvement of Plants (3 credits)
CSP606: Pulse and Oil Crops Production (3 credits)
Optional Courses (take at least one course)
CSP622: Economic Entomology (3 credits)
OR
CSP626: Weed Management (3 credits)
OR
CSP610: Integrated Natural Resources Management (3 credits)
Total (12 credits)

Semesters 3 & 4

Core Courses
CSP701: Proposal Development (6 credits)
CSP702: Research & Dissertation (18 credits)
Total (24 credits)

CROP PROTECTION STREAM (FULL TIME)

Semester 1

Core Courses
CSP621: Insect Taxonomy and Systematics (3 credits)
CSP623: Mycology (3 credits)
CSP641: Experimental Design (3 credits)
Optional courses (take at least one course)
CSP625: Plant Virology (3 credits)
OR
CSP605: Plant Biotechnology (3 credits)
OR
CSP603: Cropping Systems (3 credits)
Total (12 credits)

Semester 2

Core Courses
CSP622: Economic Entomology (3 credits)
CSP624: Nematology (3 credits)
CSP626: Weed Management (3 credits)
Optional Courses (take at least one course)
CSP604: Genetic Improvement of Plants (3 credits)
OR
CSP628: Plant Bacteriology (3 credits)
OR
CSP644: Postharvest Physiology (3 credits)
Total (12 credits)

Semesters 3 & 4

CSP701: Proposal Development (6 credits)
CSP702: Research & Dissertation (18 credits)
Total (24 credits)

HORTICULTURE STREAM (FULL TIME)

Semester 1

Core Courses
CSP641: Experimental Design (3 credits)
CSP643: Pomology (3 credits)
CSP601: Eco-Physiology of Crop Plants (3 credits)
Optional Courses (take at least one course)
CSP645: Flower Science (3 credits)
OR
CSP605: Plant Biotechnology (3 credits)
OR
CSP663: Plant Nutrition (3 credits)
Total (12 credits)

Semester 2

CSP642: Olericulture (3 credits)
CSP644: Postharvest Physiology (3 credits)
CSP646: Landscaping (3 credits)
Optional Courses (take at least one course)
CSP648: Seed production (3 credits)
OR
CSP622: Economic Entomology (3 credits)
OR
CSP626: Weed Management (3 credits)
Total (12 credits)

Semester 3 & 4

CSP701: Proposal Development (6 credits)
CSP702: Research & Dissertation (18 credits)
Total (24 credits)

SOIL SCIENCE STREAM (FULL TIME)

Semester 1

Core Courses
CSP661: Soil Ecology (3 credits)
CSP663: Plant Nutrition (3 credits)
CSP641: Experimental Design (3 credits)
Optional Courses (take at least one course)

CSP601: Eco-Physiology of Crop Plants (3 credits)
OR
CSP603: Cropping Systems (3 credits)
OR
CSP605: Plant Biotechnology (3 credits)
Total (12 credits)

Semester 2
Core Courses
CSP662: Soil Chemistry (3 credits)
CSP664: Soil Morphology, Genesis and classification (3 credits)
CSP666: Soil Physics (3 credits)
Optional Courses (take at least one course)
CSP606: Pulse and Oilseed Crops Production (3 credits)
OR
CSP610: Integrated Natural Resources Management (3 credits)
OR
CSP646: Landscaping (3 credits)
Total (12 credits)

Semesters 3 & 4
CSP701: Proposal Development (6 credits)
CSP702: Research & Dissertation (18 credits)
Total (24 credits)

AGRONOMY STREAM (PART TIME)

Semester 1
Core Courses
CSP601: Eco-Physiology of Crop Plants (3 credits)
CSP641: Experimental Design (3 credits)
Total (6 credits)

Semester 2
Core Course
CSP606: Pulse and Oil Crops Production (3 credits)
Optional Courses (take at least one course)
CSP622: Economic Entomology (3 credits)
OR
CSP626: Weed Management (3 credits)
OR
CSP610: Integrated Natural Resources Management (3 credits)
Total (6 credits)

Semester 3
Core Course
CSP603: Cropping Systems (3 credits)
Optional Courses (take at least one course)
CSP605: Plant Biotechnology (3 credits)
OR
CSP607: Fibre Crops Production (3 credits)
OR
CSP663: Plant Nutrition (3 credits)
Total (6 credits)

Semester 4
Core Courses
CSP602: Cereal Grain Crops Production (3 credits)
CSP604: Genetic Improvement of Plants (3 credits)
Total (6 credits)

Semesters 5 & 6
CSP701: Proposal Development (6 credits)
CSP702: Research & Dissertation (18 credits)
Total (24 credits)

Student/supervisor contact = At least once a month. Projects will be conducted in the field as well as in the laboratory

CROP PROTECTION STREAM (PART TIME)

Semester 1
Core Courses
CSP621: Insect Taxonomy and Systematics (3 credits)
CSP641: Experimental Design (3 credits)
Total (6 credits)

Semester 2
Core Course
CSP623: Economic Entomology (3 credits)
Optional Courses (take at least one course)
CSP604: Generic Improvement of Plants (3 credits)
OR
CSP610: Integrated Natural Resources Management (3 credits)
OR
CSP644: Postharvest Physiology (3 credits)
Total (6 credits)

Semester 3
Core Course
CSP623: Mycology (3 credits)
Optional Courses (take at least one course)
CSP603: Cropping Systems (3 credits)
OR
CSP605: Plant Biotechnology (3 credits)
OR
CSP625: Plant Virology (3 credits)
Total (6 credits)

Semester 4
Core Courses
CSP624: Nematology (3 credits)
CSP626: Weed Management (3 credits)
Total (6 credits)

Semesters 5 & 6

CSP701: Proposal Development (6 credits)
CSP702: Research & Dissertation (18 credits)
Total (24 credits)

Student/supervisor contact = At least once a month. Projects will be conducted in the field as well as in the laboratory

HORTICULTURE STREAM (PART TIME)

Semester 1

Core Courses
CSP641: Experimental Design
(3 credits)
CSP601: Eco-Physiology of Crop Plants
(3 credits)
Total (6 credits)

Semester 2

Core Course
CSP642: Olericulture (3 credits)
Optional Courses (take at least one course)
CSP610: Integrated Natural Resources
Management (3 credits)
OR
CSP622: Economic Entomology (3 credits)
OR
CSP626: Weed Management (3 credits)
Total (6 credits)

Semester 3

Core Course
CSP643: Pomology (3 credits)
Optional Courses (take at least one course)
CSP645: Flower Science (3 credits)
OR
CSP605: Plant Biotechnology (3 credits)
OR
CSP663 :Plant Nutrition (3 credits
Total (6 credits)

Semester 4

Core Courses
CSP644: Postharvest physiology (3 credits)
CSP646: Landscaping (3 credits)
Total (6 credits)

Semesters 5 & 6

CSP701: Proposal Development (6 credits)
CSP702: Research & Dissertation (18 credits)
Total (24 credits)

Student/supervisor contact = At least once a month. Projects will be conducted in the field as well as in the laboratory

SOIL SCIENCE STREAM (PART TIME)

Semester 1

Core Courses
CSP641: Experimental Design (3 credits)
CSP661: Soil Ecology (3 credits)
Total (6 credits)

Semester 2

Core Course
CSP661: Soil Chemistry (3 credits)
Optional Courses (take at least one course)
CSP606: Pulse and Oilseed Crops Production (3 credits)
OR
CSP610: Integrated Natural Resources Management
(3 credits)
OR
CSP646: Landscaping (3 credits)
Total (6 credits)

Semester 3

Core Course
CSP663: Plant Nutrition (3 credits)
Optional Courses (take at least one course)
CSP601: Eco-Physiology of Crop Plants
OR
CSP603: Cropping Systems (3 credits)
OR
CSP605: Plant Biotechnology (3 credits)
Total (6 credits)

Semester 4

Core Courses
CSP666: Soil Physics (3 credits)
CSP664: Soil Morphology, Genesis and Classification
(3 credits)
Total (6 credits)

Semesters 5 & 6

CSP701: Proposal Development (6 credits)
CSP702: Research & Dissertation (18 credits)
Total (24 credits)

Student/supervisor contact = At least once a month. Projects will be conducted in the field as well as in the laboratory.

MPhil/PhD IN CROP SCIENCE

The Department of Crop Science and Production offers Master of Philosophy (MPhil) and Doctor of Philosophy (PhD) in Crop Science.

The streams in the programme are Agroforestry, Agronomy, Crop Protection, Horticulture and Soil Science. Students will be able to conduct research in their area of specialisation.

The candidates targeted to join the programme will include BSc honours and MSc graduates in Biological Sciences and other related disciplines as per general academic regulation 50.0

COURSE SYNOPSIS

CSP601:Eco-Physiology of Crop Plants

This course will focus on current knowledge of the key plant processes, the capture and use of physical resources by crop communities and the role of management practices in resource capture and use.

CSP602:Cereal Grain Crops Production

This course will cover botanical characteristics, ecological requirements, production systems utilization, adaptation and improvement of yield and quality characteristics.

CSP603: Cropping Systems

This course will examine the agronomic characteristics of cropping systems in relation to their relative productivity, use of resources in contrasting environments, management strategies and research methodology.

CSP604: Genetic Improvement of Plants

This course will focus on qualitative and quantitative inheritance, breeding methods emphasizing environmental stresses, resistance breeding, genetic resources, varietal release and seed production.

CSP605: Plant Biotechnology

This course will cover concepts and principles of biotechnology, plant biotechnology procedures and methods, implications and opportunities for society.

CSP606: Pulse and Oil Crops Production

The course will focus on the factors affecting production, performance, adaptation and improvement of leguminous and oilseed crops.

CSP607: Fibre Crops Production

The course will cover botanical characteristics, production systems, utilization, adaptation, improvement in yield, quality characteristics, processing and storage.

CSP610: Integrated Natural Resources Management

This course will focus on the concepts, key issues and practices in integrated management of natural resources in agricultural systems.

CSP621: Insect Taxonomy and Systematics

The course will cover principles and methods in insect taxonomy and systematics. Insect morphology will be reviewed to understand the basis for insect diversity and success. The course will familiarise students with the morphology, ecology and evolution of major insect groups of agricultural importance. Students will also learn and gain experience in the collection, curation and identification of insects using taxonomic keys.

CSP622: Economic Entomology

This course will cover economic application of the pest management strategies. Integration of chemical, biological, cultural and physical tactics into an overall pest management strategy will be emphasized. The course will also cover toxicology of insecticides.

CSP623: Mycology

The course will cover biology and taxonomy of fungi, symbiotic associations between fungi and plants, genetics and variability in fungi, identification of fungal plant pathogens, epidemiology and control of fungal diseases of crops and fungi as biological control agents.

CSP624: Nematology

The course covers the morphology and anatomy of nematodes, growth reproduction, distribution, ecology, identification, classification and the economic importance of nematodes as plant parasites. The theory, foundation, principles and practices of nematode management and the techniques used to study and manage nematodes populations will also be covered.

CSP625: Plant Virology

The course will cover chemical nature, replication, taxonomy and pathogenesis of viruses. Modern techniques used in detection of viruses in plants, types of disease and their control measures will also be covered.

CSP626: Weed Management

The course will cover ecological aspects of weed management, identification and classification of weeds, principles and practices of weed management, and the application of these principles towards integrated weed management in crops. Emphasis will be placed on applied weed management in major crops.

CSP628: Plant Bacteriology

The course will cover morphology and structure, taxonomy, genetics and ecology, serology and molecular techniques for identification of phytopathogenic bacteria. Pathogenesis, infection and disease development, epidemiology; and control of specific bacterial diseases and bacteria as bio-control agents will also be covered.

CSP641: Experimental Design

This course will cover introduction to principles and practices of agricultural experimental designs, analysis and computer applications.

CSP642: Olericulture

The course will cover factors affecting growth, development, yield and quality of vegetable crops.

CSP643: Pomology

The course will cover fruit and nut crop productivity, nutrition, water use, fruiting, tree size, fruit quality, pruning, growth, development and orchard management.

CSP644: Postharvest Physiology

The course will cover quality components, deterioration, oxidative processes, fruit ripening, postharvest water relations, physiological disorders, the physiological basis of storage technology and flower senescence.

CSP645: Flower Science

The course will cover principles, management, preand postharvest physiology and agronomy of important cut-flowers, potted flowering and foliage ornamental plants, and bedding plants.

CSP646: Landscaping

This course covers principles and practices of landscaping, landscape features and design, planning and installation, indoor and outdoor plants, turf culture, landscape maintenance and landscape contracting.

CSP648: Seed Production

This course covers the science and technology of seed production with respect to development, composition, quality, harvesting, processing, packaging and storage of horticultural and field crops.

CSP661: Soil Ecology

The course will cover soil as a habitat for organisms, organic matter decomposition, distribution of organisms in soils and their interactions.

CSP662: Soil Chemistry

The course will cover the physicochemical processes in soils and soil solutions, ionic equilibria, mineral stability, organic complexation, and surface sorption of major plant nutrients and heavy metals.

CSP663: Plant Nutrition

The course will cover factors affecting nutrient uptake from the soil, uptake and transport of water and nutrients by plants, macro and micronutrients essential for plant growth.

CSP664: Soil Morphology, Genesis and Classification

The course will cover chemical, physical and mineralogical parameters useful in characterizing soils, soil forming processes, historical development and current concepts of the FAO and soil taxonomy and classification systems and major soils of Botswana.

CSP666: Soil Physics

The course will cover composition and physical properties of soil, theory of potentials and static equilibria in soils, flow of water, gas, and heat in soils for optimum plant growth.

MPHIL AND PhD

The MPhil & PhD programmes are offered in accordance with the provisions of Regulation 50.0