TAITA TAVETA UNIVERSITY

SCHOOL OF AGRICULTURE, EARTH, AND ENVIRONMENTAL SCIENCES

DEPARTMENT OF AGRICULTURAL SCIENCES

BACHELOR OF SCIENCE IN RANGELAND ECOSYSTEM MANAGEMENT CURRICULUM

REGULATIONS AND SYLLABUS FOR THE DEGREE OF BACHELOR OF SCIENCE IN RANGELAND ECOSYSTEM MANAGEMENT

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INTRODUCTION

1.1 Background

Globally, key ecosystems include wetlands, forests, grasslands, woodland, bushlands, deserts and rangelands. The rangelands are critical ecosystems, covering over forty per cent (40%) of the earth's land surface. These rangelands provide a habitat to over 38% of the human population, with rural communities making direct living from the inherent rangeland resources. Rangeland ecosystems in sub-Saharan Africa provide a home to humans, livestock and wildlife populations, harboring a huge diversity of flora and fauna. The ecosystems are currently undergoing severe and detrimental transformations from the impacts of climate change and variability making their future very uncertain. In addition, the increasing human population coupled with urbanization has increased pressure on the land resources, resulting in intensified rangeland degradation. The increasing food demand has expanded the area of land under agricultural production, with rangeland ecosystems being the only remaining open space for targeted expansion. This has exacerbated unsustainable production practices which further result in land degradation.

The rangeland ecosystems in Kenya contribute immensely to the Gross Domestic Product (GDP), just like in most countries in the developing world. In Kenya, rangelands constitute over eighty-nine (89%) of the country and are home to approximately 35% of the human population, support seventy per cent (70%) of the national livestock herd and about 80% of the wildlife and other biodiversity. Despite their importance, rangelands in Africa have continued to suffer from human-induced degradation, with about thirty per cent (30%) of them threatened by severe loss of productivity. In East African drylands, rangelands provide support to over 60% of livestock keepers as their main livelihood option. The major threats to these rangelands include land degradation, urbanization, agricultural intensification, and climate change impacts. These threats have resulted into droughts, floods, emergence of new pests and diseases for both crops and animals, which have greatly affected the sustainability of these ecosystems.

The Bachelor of Science. Rangeland ecosystem Management degree programme is therefore designed to train highly skilled personnel to address these challenges. The programme is particularly cognizant of the increased vulnerabilities of rangeland ecosystems to impacts of climate change, rangeland fragmentation and degradation especially in East Africa, and is designed to build emphasis on training on practical skills to increase sustainability and resilience of rangeland ecosystems for better livelihoods and wild biodiversity survival.

1.2 Philosophy of the Programme

The school of agriculture earth and environmental sciences strongly believes in supporting advances in various aspects of rangeland science and community development practices in the rangeland ecosystem. There is increasing need to have well trained personnel with expertise in sustainable rangeland management, to provide leadership and stewardship for a sustainable framework for managing rangelands.

This paradigm underlies the philosophy of linking the programme delivery with hands-on training, support to applied research and policy support ability to effectively contribute to sustainable rangeland ecosystem development and management. Universities have a key role in providing technical support in theory and practice by being proactive in training, research and innovation for sustainable rangeland resource management. This degree programme will contribute to the goal of improving the rangeland ecosystem health, while supporting sustainable livelihood options of communities and biodiversity in these ecosystems.

1.3 Rationale of the Programme

1.3.1 Needs Assessment

The national recognition of the importance of rangelands and the identification of the numerous socio-ecological and economic challenges are highlighted in the Rangeland and Pastoralism Management strategy 2021-2031. The strategy aims at supporting rangeland ecosystems in Kenya where pastoral communities' livelihoods are derived. The strategy recognized multiple use of rangeland as an important system. This curriculum supports the initiatives and will contribute to the attainment of the strategic objectives within the developed Rangeland and Grassland Management Strategy 2022-2027 by the Grassland and Rangeland Society of Kenya. The strategy seeks to contribute to rangeland resource management in a sustainable manner. The programme aims to support critical rangeland issues, which include the identified need for biodiversity conservation and management, a critical component that supports the well-being of the society and environment protection.

Other concerns identified are increased trends towards investments in irrigated agriculture, payment for ecosystem services, mining, wind and solar power generation. In view of the aforementioned importance of rangelands in supporting livelihoods and provision of ecosystem services, there is a need for enhanced human capacity building in rangeland management. A needs assessment undertaken by IGAD Centre for Pastoralism and Livestock Development (ICPALD) in 2019 revealed the need for specialized personnel to undertake stewardship of the rangelands for sustainable natural resources management and livestock production. In Kenya, this has become more urgent given the promulgation of the Kenyan Constitution 2010 that has decentralized most of the functions to devolved units in the counties, where there is limited skilled human resource capacity in rangeland ecosystem management

This curriculum aims at training and equipping rangeland ecosystem professionals with appropriate scientific knowledge and skills required to implement sustainable and climate resilient technologies and practices aimed at securing livelihoods. The program will empower the professionals to meet emerging socio-economic and environmental challenges nationally, regionally and internationally. This will enable rangeland ecosystems to continue playing a significant role in the national, regional and global economies.

1.3.2 Stakeholders Involvement

Stakeholders representing different interests groups such as academia, private sector practitioners, former and current graduate students from Taita Taveta University, researchers, representatives from county and national government, and national and international NGOs were engaged by the Department of Agricultural Sciences, School of Agriculture, Earth and Environmental Sciences to seek their views on the programme on August 1st-31st, 2022, through a workshop meeting, as well as through online submissions. Their views were consolidated and incorporated to ensure the programme developed is responsive to market needs and contemporary challenges in the rangeland ecosystems.

1.3.3 Justification of the need for the programme

The BSc (Rangeland Ecosystem Management) programme has been developed to support the attainment of the Sustainable Development Goals (SDGs). The programme contributes directly to the achievement of Sustainable Development Goals (SDG) 1 and 2 on poverty reduction and food security enhancement respectively, SDG 13 on climate change mitigation and adaptation and SDG 15 on sustainable land management and biodiversity conservation. Attainment of these SDGs will be highly influenced by the production practices and processes within the vast rangelands of over 40% global and 83% of Kenya's land mass. To achieve sustainable development, proper planning and management is paramount. The need to reduce environmental risks during implementation of the programme is necessary for sustainable production processes which require well trained and skilled personnel to work with the communities. Thus, the present curriculum has been designed to address all the areas that will contribute to skills development and provide the needed experience to professionals trained on how to sustainably manage these fragile ecosystems.

The programme also contributes to the national rangeland management strategic framework for pastoralism, regional rangeland management strategic framework by IGAD. The programme will also build skills needed to support the 23 county governments in the Arid and Semi-Arid Lands (ASAL), especially with the implementation of the County Integrated development plans (CIDPs). To this end, the programme will produce experts capable of addressing national, regional and international obligations for sustainable rangeland ecosystems development and management. The BSc (Rangeland Ecosystem Management) Programme will directly respond to the training needs gap and contribute towards the achievement of the SDGs.

1.4 Programme Goal

The BSc. (Rangeland Ecosystem Management) aims at producing holistic graduates equipped with knowledge and skills in rangeland resource management with core competence in the following areas; rangeland ecology and biodiversity conservation and natural resource management, range livestock management and nutrition, sustainable watershed management, and resource economics while taking cognizance of the central role played by local communities in sustainable rangeland ecosystem management.

1.4.1 Expected Learning Outcomes

At the end of the programme, the learner should be able to:

i. Explain the principles of sustainable rangeland ecosystem management and how they are used in solving challenges at local community level for better livelihoods.
ii. Articulate rangeland ecosystems resource challenges and prescribe appropriate solutions for their sustainable management.
iii. Transfer appropriate innovative technologies to communities for sustainable rangeland ecosystems resource exploitation and management.
iv. Apply the gained knowledge in policy formulation for resilient rangeland ecosystems and livelihoods.

2.0 MODE OF DELIVERY

2.1 Face-Face Mode

The programme will adopt a face-to-face mode of delivery that will be based on various techniques including didactic lectures, seminars, case-based learning and tutorials.

2.2 Open, Distance and Electronic Learning (ODeL)

Use of various media that are largely home or office-based. Mediated technical learning materials including audio-visual, e-learning materials, will be employed.

2.3 Asynchronous Learning

Asynchronous mode of learning will be used to allow students to learn on their own schedule by providing access to instructional materials and assignments within a certain timeframe.

2.4 Blended Learning

The course will be delivered through a combination of face-to-face, and ODeL where applicable.

3.0 ADMISSION REQUIREMENTS

3.1 Minimum Admission Requirements

3.1.1 The ecosystem management degree programme at Taita Taveta University shall apply common regulations governing admission into a Bachelor's of Science in rangeland.

3.1.2 Holders of KCSE with a Mean Grade of C+ with passes of C or above in Biology, Chemistry, Maths or Physics or Geography, and one of the following subjects: - English, Kiswahili, Physics (if not included above), History and Government, Geography (if not included above), CRE, Computer Studies, German, Music, Islamic Religious Education, Hindu Religious Education, Home Science, Art & Design, Agriculture, Aviation Technology, French, Arabic, Business Studies.

3.1.3 Holders of KACE or equivalent with a minimum of two (2) Principal Passes in Biology or Geography and Chemistry and at least a subsidiary pass in Mathematics or Physics. If Mathematics or Physics was not offered at KACE, then it is accepted at Ordinary Level but with a minimum of a Credit Pass.

3.1.4 Holders of a Diploma in Agricultural Sciences, Livestock sciences, environmental sciences or related sciences from a recognized institution with KCSE mean grade of C or above or KCE Division 3 or above.
3.1.5 Holders of Certificate and Diploma in Agricultural Livestock sciences, environmental sciences or related sciences from a recognized institution with KCSE mean grade of D+ or above or KCE Division 4 or above.
3.1.5 Holders of a degree in biological sciences or other related sciences from a recognized University.
3.1.6 Applicants who do not demonstrate proficiency in English will be required to undertake an English language course.

3.2 Exemptions and Credit Transfer

3.2.1 Exemptions

Students may be exempted from some courses by Senate on the recommendation of the School Academic Board provided that:

(a) Such candidates must have taken those courses in a recognized University or equivalent institution and had achieved a pass standard.
(b) Candidates seeking such exemption shall submit a duly completed senate approved form specifying the courses for which exemption is desired and attach evidence showing course content of what was studied.
(c) The courses specified are to satisfy the requirements of the first year of study only. Candidates requiring exemption from 2nd, 3rd and 4th-year courses shall in the absence of credit transfer be required to sit university examination and attain at least pass grade, which will then be used in the degree classification.
(d) Course units recommended for exemption should not exceed 1/3 of the total units in the degree programme.
(e) Students admitted into the 2nd year of study shall be deemed to have already been exempted from twenty-five per cent (25%) of the total units in the degree programme.
(f) A non-refundable course exemption fee as determined by the University is paid with each application for exemption.

3.2.2 Credit Transfer

(a) Transfer of academic credits is accepted, on an individual basis, for courses undertaken and completed by students from accredited universities/institutions who request to transfer the same to Taita Taveta University, for incorporation into the degree course and final classification of the degree.
(b) The relevant academic body as approved by the University Senate shall make an official evaluation and transfer of credits to Taita Taveta University
(c) The number of hours, content and grading of courses for which credit transfer is sought should be similar to the courses offered at Taita Taveta University.
(d) Only grades of C and above will be transferred.
(e) Only a maximum of one-third (1/3) or equivalent of the study programme at Taita Taveta University can be transferred.

4.0 COURSE REQUIREMENTS

4.1 Student Obligation

4.1.1 The learner should attend lectures, complete assignments and practical sessions in consultation with the lecturers and technologists.

4.1.2 A student shall be required to attend at least two-thirds of the lecture sessions in the course unit to be eligible to sit for the final assessment.

4.1.3 All course units are compulsory except in cases where credit transfer or exemption has been approved.

4.1.4 Students shall register for all course units within the first 3 weeks at the beginning of the semester in question.

4.1.5 A student shall be required to attend scheduled seminars and presentations.

4.1.6 Where a student is unable to continue with his/her studies for reasons acceptable to the university senate, one will be allowed to take time off provided the absence from the University does not exceed one year.

4.1.7 A candidate, who absconds from the programme at any level, shall be deregistered on the grounds of Abscondment

4.2 Lecturer Obligation

4.2.1 The lecturer shall ensure full coverage of the syllabus promptly and facilitate lectures, discussions and practical sessions.

4.2.2 The lecturer shall be required to set, invigilate and mark examinations as timetabled.

4.2.3 The lecturer shall be required to assess student practical work and oral presentations.

4.2.4 The lecturer shall be required to guide, mentor and supervise students.

4.2.5 The supervisors of students undertaking project research shall ensure timely assessment of the research process including holding regular progress meetings.

5.0 STUDENT ASSESSMENT CRITERIA

5.1 Coursework

5.1.1 The students will be assessed for all course units.

5.1.2 The taught course units shall be assessed through the following:

5.1.3 Continuous assessment tests based on completion of assignments, practical, term papers, oral presentations and written tests.

5.1.4 Each taught course will be examined by a 2-hour written examination at the end of the semester.

5.2 Research Project

5.2.1 Research project examination shall follow common procedures for the School of Agriculture, Earth and Environmental Sciences. The common procedures will include:

i. Oral presentation of the proposal.
ii. Submission of the written proposal.
iii. Oral presentation of the research project.

iv. Submission of a written research report.

6.0 DURATION OF STUDY AND DEGREE PATTERN

(a) The Bachelor of Science in Rangeland Ecosystem Management shall take four academic years.
(b) Every academic year shall consist of two semesters of sixteen weeks each. The last two weeks of each semester shall be devoted to examinations.
(c) A candidate for the Degree of Bachelor of Science in Rangeland Ecosystem Management shall be required to undertake practical attachment for a period of not less than eight (8) weeks during the second year and teaching practice in third year of study.
(d) No candidate shall be allowed to sit for examinations without attending at least two-thirds of the lectures and all practicals.
(e) Course lecturers shall teach, set, administer, mark and grade examinations.
(f) This programme will be taught using a combination of teaching methodologies such as Lectures, Tutorials, Demonstrations, Field Trips / Industrial Visits, Laboratory / Workshop Practicals, Group Discussions, Individual and Group Projects, Field Attachment and Teaching Practice.
(g) Course lecturers shall carry out individual teaching evaluation through: Time based course outlines, assessing objective achievement per topics, continuous assessment, end of semester examinations and teaching practice assessment.

7.0 ACADEMIC LEAVE

A student wishing to temporarily suspend his/her studies must apply for academic leave. The leave becomes official only after endorsement by the University Senate. Academic leave can only be taken at the start of the semester. The leave cannot extend beyond two (2) continuous semesters and the leave duration will not be part of the programme duration. A candidate must renew his/her registration at the beginning of every semester.

8.0 REGISTRATION AND SIGNING OF NOMINAL ROLL

a) Candidates shall be required to register within the first three weeks of the semester.
b) Candidates who wish to change the programme of study should do so within the first three weeks of the semester of the first year provided that they meet the necessary entry requirements into the new programme they wish to enroll in.

9.0 GRADING SYSTEM

The grading of each taught course unit shall be as follows:

Grade	Marks Range
A	70 -100%
B	60 - 69%
C	50 - 59%
D	40 - 49%

FAIL	Below 40%

10.0 EXAMINATION REGULATIONS

10.1 Coursework Examinations

The conduct of examinations shall be governed by the following regulations:

10.1.1 No candidate shall be allowed to sit for examinations without attending at least two-thirds of the lectures and all practicals.

10.1.2 Each course unit shall be examined out of 100%.

10.2 ORDINARY EXAMINATIONS

a. All units shall be examined during the semester in which they are taken.
b. The examination pass mark in each unit shall be 40 % of the total marks.
c. No candidate shall be allowed to sit for examinations without attending at least two-thirds of the lectures and all practicals.
d. The University examinations shall consist of papers each covering one unit during the semester. The time allowed shall be two hours per paper, except in drawing that shall be three hours.
e. Continuous assessment shall contribute 30% and written University examinations shall contribute 70% of the total marks, except where a course consists solely of practical work, it shall be assessed 100% by continuous assessment test, coursework and/or laboratory assignments. The weighting for continuous assessment in units that have practicals shall be as follows:
   15% Practicals
   5% Assignments
   10% Tests
f. Where a course has no practicals or laboratory assignments the weighting of the continuous assessment shall be composed of 20% tests, and 10% assignments.
g. Practical attachment / teaching practice shall be assessed and graded on pass or fail basis.
h. A candidate who misses an examination without a valid reason shall be deemed to have failed the examination, and shall be awarded a score of zero in the specific examination.

10.3 SUPPLEMENTARY EXAMINATIONS

10.3.1 A candidate shall be permitted to sit supplementary examinations in failed units up to a maximum of five units in School of Agriculture, Earth and Environmental Sciences in any one year of study.

10.3.2 Supplementary examinations shall normally be held at the end of the academic year during which the units have been taken.

10.3.3 The maximum marks in supplementary examinations shall be 40% and shall not include continuous assessment marks.

10.3.4 A candidate who fails a unit evaluated wholly by continuous assessments shall be required to carry out additional work for examination during the supplementary examination period.

10.3.5 A candidate who fails a maximum of one supplementary unit in the first or second year of study shall be allowed to proceed to the next year of study to re-sit the unit during the next time the unit is being offered. Such a candidate shall not be deemed to have repeated the year of study.

10.4 SPECIAL EXAMINATIONS

10.4.1 If through unavoidable circumstances such as bereavement or sickness a candidate is unable to sit for one or more examination papers, or is unable to undertake essential parts of the work for the continuous assessment the candidate may, on the recommendation of the School Board of Examiners and with the approval of the Senate, be permitted to take special examinations or undertake extra work for continuous assessment.

10.4.2 Special examinations shall be graded out of 100% and shall include continuous assessment marks.

10.5 REPEATING

10.5.1 A candidate who fails a maximum of one (1) supplementary unit during the first year of study shall be allowed to proceed to the next year of study and re-sit the unit when it is next offered. Such a candidate shall not be deemed to have repeated the year of study.

10.5.2 A candidate who fails a maximum of two supplementary units shall be allowed to proceed to the next year of study to re-sit the units, during the next time the units are being offered. Such a candidate shall be deemed to have repeated the year of study.

10.5.3 A candidate who fails more than two but less than six units after sitting supplementary examinations shall be allowed to register and re-sit the failed units externally in the subsequent academic year. Such a candidate shall be deemed to have repeated the year of study.

10.5.4 A candidate who fails in six (6) or seven (7) units at the ordinary university examinations in any given year of study shall not be allowed to sit Supplementary Examinations but shall be allowed to repeat the failed units externally during the subsequent academic year. The candidate shall have the option of attending classes subject to payment of appropriate fees for all the failed units. Such a candidate shall be deemed to have repeated the year of study.

10.5.5 A candidate who fails to attend at least two-thirds of the lectures and all practicals in any unit(s) subject to a maximum of 6 or 7 units in any academic year, shall be required to re-do the unit(s). Such a candidate shall be deemed to have repeated the year of study.

10.5.6 A candidate who fails in one or less than six units prescribed under the final year of study during Supplementary Examinations shall re-sit the failed units externally in the subsequent academic year during the Ordinary Examinations when the units are offered. Such a candidate shall be deemed to have repeated the year of study.

10.5.7 During the entire period of study, no candidate shall be allowed to repeat any year of study twice.

10.5.8 During the entire period, no candidate shall be allowed to repeat a total of more than two years of study in School of Agriculture, Earth and Environmental Sciences.

10.6 RE-ADMISSION

(a) A candidate may be re-admitted to the year of study from academic leave, or on compassionate grounds such as bereavement or sickness, on the recommendation of the School Board of Examiners and with the approval of the Senate.

(b) A candidate who has been re-admitted after completing the first semester of academic year successfully shall be allowed to register only for the second semester of the academic year he/she is being re-admitted into. The results of the examinations taken in the first semester shall stand.

10.7 DISCONTINUATION

(a) A candidate who fails in eight (8) or more units at the ordinary University examination in any academic year shall be DISCONTINUED.

(b) A candidate who fails a unit after a total of four attempts shall be DISCONTINUED.

(c) A candidate who fails in any unit after re-sitting externally, even after Supplementary Examinations shall be DISCONTINUED.

(d) A candidate who repeats the year of study after failing six (6) or seven (7) units at the Ordinary University Examinations, and subsequently fails in any unit during the Supplementary Examinations at the end of the repeating year shall be DISCONTINUED.

(e) A candidate, who absconds from the programme at any level, shall be deregistered on the grounds of Abscondment.

10.8 PROGRESSION

(a) In order to proceed unconditionally to the second, third, and fourth year of study for the Bachelor of Science degrees in School of Agriculture, Earth and Environmental Sciences candidates must pass in all the required units.

(b) Candidates must pass in all the required units in the final year of study in order to qualify for the award of their respective degree**.**

10.9 TRANSCRIPTS

At the end of each academic year, candidates shall be provided with a transcript in form of literal grades for the units taken during the year with one of the following recommendations:

a) Proceed to the next year of study.
b) Repeat the year externally
c) Proceed to the next year of study conditionally
d) Discontinued
e) Degree to be awarded.
f) Provisional examination results shall be issued by the School Academic Board.

10.10 APPEAL FOR RE-ASSESSMENT

10.10.1 A candidate may appeal to the Registrar (Academic, Research and Outreach) for a re-marking of a written examination paper on payment of appropriate fee that the senate shall determine from time to time, and on surrendering the transcript on which the grade for the concerned unit has been recorded, if already issued.

10.10.2 The final mark recommended by the appointed examiner(s) shall be the final mark and grade awarded to the candidate for the unit.

10.10.3 No appeal for re-marking of any units shall be entertained four weeks (one month) after the candidate has been notified of the results.

10.11 EXAMINATION IRREGULARITIES

(a) A candidate found guilty of any irregularities during any continuous assessment or University Examinations shall be subject to disciplinary action as per the University Examination Regulations.
(b) The Senate Examination Disciplinary Committee regulations shall apply in all examination disciplinary cases.

10.12 DEGREE AWARD

(a) To be considered for the award of the degree of Bachelor of Science in the School of Agriculture, Earth and Environmental Sciences, a candidate must have passed all the required units in their respective departments.
(b) No candidate shall be awarded the degree without passing practical attachments.
(c) The Final Year Project (Research Projects I and II) shall be assessed through a written report and verbal presentation. The student must pass in this unit in order to graduate and it also counts towards degree classification.
(d) No candidate shall graduate without taking and passing all the units.

10.13 Research Project

10.13.1 A candidate shall undertake an approved research project (ARM 2407) under the supervision of academic staff. The project shall run for two semesters and shall be equivalent to two course units (90 instructional hours).

10.13.2 Research projects shall be examined by written reports and presentations and shall be graded for use in the degree classification. The research project proposal shall constitute thirty per cent (30%), the project report shall constitute forty per cent (40%) and the oral presentation of the report shall constitute thirty per cent (30%). Total mark shall be 100%. The pass mark for the research project shall be forty per cent (40%).

10.13.3 The project report format will contain an abstract, introduction, literature review, methodology, results, discussions, conclusion, references/bibliography and appendices.

10.13.4 The report shall be subjected to an anti-plagiarism test before oral presentation accepted at twenty per cent (20%) at the department for examination. Anti-plagiarism report shall be part of the project report.

A candidate who fails to satisfy the examiners in the project shall be allowed up to two re-submissions of the project report.

10.13.5 A candidate who fails in the third attempt shall retake the course.

10.14 Field Attachment

The Field Attachment will be examined by oral examination and written reports. The grades shall be used in the degree classification. Evaluation of the students while in the field shall constitute thirty per cent (30%), written reports forty per cent (40%) and oral presentations thirty per cent (30%). Total mark 100.

For purposes of these regulations, the Field Attachment shall be deemed to be part of the third year.

10.15 Moderation of Examinations

Examinations shall be moderated internally and externally to ensure they meet the University standards. A qualified external examiner who will be appointed by the Senate of Taita Taveta University in consultation with the Department shall be invited to moderate the end of semester assessment.

10.16 The Role of Internal Examiner

Both the internal moderator and the External Examiner. S/he also marks the examination scripts and considers. The internal examiner sets the examination paper and incorporates the corrections suggested by the changes suggested by the External Examiner.

10.17 The Role of External Examiner

The External examiner moderates both the draft examination papers and the marked examination scripts and where necessary suggests changes. S/he ensures that the syllabus coverage is adequate and the standards of setting and marking are high.

11.0 GRADUATION REQUIREMENTS

11.1 Award of the Degree

A candidate's release of results and awarding of the degree shall be subject to the candidate fulfilling all University Regulations concerning payment of fees and other monies due to the University.

11.1.1 The degree to be awarded shall be BSc (Rangeland Ecosystem Management).

11.1.2 To qualify for the graduation and the award of the degree of Bachelor of Science in Rangeland Ecosystem Management, the candidate shall meet the following requirements:

i. Pass all taught courses by scoring a mark of forty per cent (40%) or above.
ii. Meet all university graduation requirements including clearance and payment of graduation fees.

11.2 Classification of Degree

The final degree of Bachelor of Science in Rangeland Ecosystem Management shall:

i. Be awarded to candidates who have completed and passed examinations in all courses of study including field attachment.
ii. Be based on the average score of all examinations of courses taken in all the years of study except the course UCU 2102 Health Education.
iii. In classifying the degree for each candidate, the School Academic Board shall consider the overall mean mark obtained by the candidate. The total marks will be averaged to two decimal points to arrive at the final classification. The degree shall be graded as follows:

Marks Range	Classification
70% and above:	First Class Honours
60% and above but less than 70%:	Second Class Honours (Upper Division)
50% and above but less than 60%:	Second Class Honours (Lower Division)
40% and above but less than 50%:	Pass

12.0 COURSE EVALUATION

Delivery of B.Sc (Rangeland Ecosystem Management) curriculum shall be guided by applicable procedures and practices of Taita Taveta University Quality Management System that include:

a. Evaluation of delivery of taught course units at the end of the semester as prescribed by the procedure for teaching.
b. Taita Taveta University's internal quality audits of conformance to set standards.
c. Recommendations of external examiners on quality improvements in the delivery of the course, appropriateness of the content and management of examination.

13.0 MANAGEMENT AND ADMINISTRATION

13.1 Programme Placement

The programme shall be domiciled at the Department of Agricultural sciences, in the School of Agriculture, Earth and Environmental Sciences, Taita Taveta University.

13.2 Academic Leadership

The programme shall be headed by an academic leader who has a PhD in Range Management or equivalent and possess at least five (5) years of university teaching experience. S/he should also be

at the rank of a Senior Lecturer and above. Appointed by the Dean of the School, the academic leader shall be responsible for:

a. Curriculum design, scheduling and delivery
b. Assessment of students and records thereof
c. Planning and management of curriculum development and review
d. Monitoring and evaluation of the programme
e. Management of feedback from students, external examiners, professional, statutory and regulatory bodies
f. Appointment, coordination and communication with/of class representatives
g. Coordination of course lecturers
h. Specifications for resources that support the programme
i. Quality assurance
j. Student academic tracking and records
k. Promotion of the programme and student enrolment
l. Staff development and training
m. Establishment and sustenance of networks and collaborations that support the programmes
n. Promotion of discipline-specific research, especially involving students
o. Mentorship of students.
p. Other related activities.

13.3 Quality Assurance Mechanisms

Quality Assurance of the programme shall be through assessment, review, teaching and examinations as shall be guided by the applicable procedures and practices at Taita Taveta University. The programme has a rigorous quality assurance mechanism that includes the following:

13.3.1 Students must sign class attendance sheets and these must be countersigned by the lecturer.

13.3.2 Students and lecturers sign a continuous assessment and examination attendance sheet whenever such assessments are done.

13.3.3 All the Programme's written examinations undergo both internal examination and external moderation.

13.3.4 At the end of every semester, students evaluate their lecturers after the completion of each course for regular review as necessary.

13.3.5 Examination results are subjected to the School Academic Board approval process before being adopted.

14.0 COURSE UNITS OFFERED

14.1 List of Course Units

First Year Course Units

Semester I

Code	Course title	Lecture	Practical	Total
		Hours	Hours	Hours
UCU 2101	Communication Skills	30	15	45
UCU 2102	Health Education	45	45	
ARM 2101	Introduction to Range Ecosystem Management	30		45
ARM 2102	Chemistry for Agricultural Sciences	45	45	
ARM 2103	Principles of Animal production	30	45	
ARM 2104	Landforms and Soil Formation	30	45	
SMA 2162	Mathematics	45	45	
BSA 2105	Academic language and writing skills	45	45	
Semester hours				**360**

Semester 2

Code	Course Title	Lecture	Practical	Total
		Hours	Hours	Hours
UCU 2103	Development studies and ethics	45	-	45
SIA 2103	Introduction to information technology	45	-	45
SAE 2101	Introduction to Ecology	30	15	45
AEE 2101	Plant biochemistry and physiology	30	15	45
ARM 2105	Principles of Soil Science	30	15	45
BEA 2103	Microeconomics	45	-	45
SBT 2202	Plant morphology and anatomy	30	15	45
Semester hours				**360**

Second Year Course Units

Semester 1

Code	Course Title	Lecture	Practical	Total
		Hours	Hours	Hours
ARM 2201	Animal physiology	30	15	45
AEE 2201	Principles of Crop Production	30	15	45
ARM 2202	Power Systems & Machinery for Agriculture	30	15	45
ARM 2203	Plant Taxonomy	30	15	45
ARM 2204	Principles of Soil Microbiology and Biochemistry	30	15	45
SZL 2206	Principles of Genetics	30	15	45
ARM 2205	Introduction to Statistics	45	-	45
Semester Hours				**315**

Semester 2

Code	Course Title	Lecture	Practical	Total
		Hours	Hours	Hours
ARM 2206	Principles of Rangeland Ecology	30	15	45
BEA 2102	Macroeconomics	45	-	45
ARM 2207	Animal Genetic Resources	30	15	45
SAE 2201	Biodiversity Conservation	45	-	45
SAE 2202	Principles of Environmental Policies and Law	30	15	45
ARM 2208	Forage Science and Pastures	45	-	45
ARM 2209	Grazing Management in Rangelands	30	15	45
Semester Hours				**315**

Third Year Course Units

Semester 1

Code	Course Title	Lecture	Practical	Total
		Hours	Hours	Hours
ARM 2301	Wildlife Management and Conservation	30	15	45
ARM 2302	Principles of Rangeland Management	30	15	45
ARM 2303	Methods of Rangeland Analysis	30	15	45
ARM 2304	Rangeland Production Systems	45	-	45
SAE 2301	Introduction Remote Sensing & GIS in Land Use Management	30	15	45

AHS 2307	Experimental Design and Analysis	45	-	45
SAE 2302	Food Security, Livelihoods and Nutrition	45	-	45
Semester Hours				**315**

Semester 2

Code	**Course Title**	**Lecture**	**Practical**	**Total**
		Hours	Hours	Hours
ARM 2305	Range Plant Resources and Utilization	30	15	45
ARM 2306	Rangeland Animal Nutrition	30	15	45
SAE 2303	Agro meteorology and climate change	30	15	45
SAE 2304	Fundamentals of Project Planning and Management	45	-	45
ARM 2307	Research Methods and Communication	45	-	45
ARM 2308	Agricultural water resource management	30	15	45
ARM 2309	Climate change, impact, mitigation and adaptation	30	15	45
ARM 2310	Field Attachment			(8 weeks)
Semester Hours				**315**

Fourth Year Course Units

Semester 1

Code	Course Title	**Lecture**	**Practical**	**Total**
		Hours	Hours	Hours
SAE 2401	Resource use and conflicts management	45	-	45
SAE 2402	Agricultural extension and technology transfer	45	-	45
ARM 2401	Animal breeding	30	15	45
ARM 2402	Agricultural economics and marketing	45	-	45
ARM 2403	Rangeland risk and resilience Assessment	-	45	45
ARM 2404	Pastoral Systems and Technological Change	30	15	45
ARM 2405	Research project and seminars	-	45	45
Semester Hours				**315**

Semester 2

Code	**Course Title**	**Lecture Hours**	**Hours practical**	**Total Hours**
ARM 2406	Apiculture	30	15	45

ARM 2407	Rangeland improvement and rehabilitation	30	15	45
ARM 2408	Rangeland resource economics and governance	45	-	45
ARM 2409	Dryland farming	45	-	45
ARM 2410	Micro-enterprise development and management	45	-	45
AEM 3111	Environmental and social impact assessment	45	-	45
ARM 2411	Animal health management	30	15	45
Semester Hours				**315**

14.2 Course Duration and Structure

14.2.1 The programme shall take four (4) academic years of eight (8) semesters.

14.2.2 An academic year shall constitute two (2) semesters.

14.2.3 The Bachelor of Science in Range Management shall be offered by course work, Industrial Practice (Attachment) and Research Project.

14.2.4 A course unit shall be defined as 45 instructional hours comprising lectures, tutorials, assignments and practical work.

14.3 Course Matrix

Expected Learning Outcome	**Course Units**
Explain the principles of sustainable rangeland ecosystem management and how they are used in solving challenges at community level for better livelihoods.	ARM 2104; ARM 2101;AEE 2103; ARM 2103
	ARM 2101 ARM 2409
	ARM 2402; ARM 2404;ARM 2401
Articulate rangeland ecosystems resource challenges and prescribe appropriate solutions for their sustainable management.	SAE 2401; ARM 2401
	ARM 2408; ARM 2409; AEM 3111
	ARM 2302; ARM 2301
Transfer appropriate technologies to communities for sustainable rangeland ecosystems resource exploitation and management.	SAE 2402; ARM 2402; ARM 2404
	ARM 2305; ARM 2302; ARM 2304;
	ARM 2207; ARM 2209
Apply the gained knowledge in policy formulation for resilient rangeland ecosystems and livelihoods	ARM 2305; ARM 2306; SAE 2303
	SAE 2304; ARM 2307; ARM 2308; ARM 2309
	ARM 2310; SAE 2302; ARM 2304