

**Sokoine University of Agriculture**  
**Faculty of Agriculture**  
**Department of Agricultural Engineering and Land Planning**

**BACHELOR OF SCIENCE IN LAND RESOURCES MANAGEMENT (B.Sc. LRM)**

**PROGRAMME AIMS**

The B.Sc. Land Resources management degree programme aims to provide:

- i. Graduates with a broad knowledge and understanding of forces at work that undermine the sustenance of land and water resources.
- ii. Graduates with a well grounded knowledge and understanding of the issues of sustainable development, conservation and environmental protection.
- iii. The necessary entrepreneurial skills required for graduates to become job creators rather than job seekers.
- iv. Professionalism that permits graduates to fill responsible professional positions.
- v. A sound base from which the graduates can embark on postgraduate studies in land resources related professional disciplines.

**Specifically, the programme aims to produce graduates who will be able to:**

- i. Determine the potentials and constraints of land resources carry out land evaluation for different land uses, and identify land areas with optimal conditions for alternative land uses.
- ii. Assess degradation of the physical environment, its impact and implement rehabilitation and restoration measures such as soil and water conservation, afforestation and other land reclamation measures.
- iii. Advise, plan and implement land resources conservation activities and programmes.
- iv. Provide the necessary analytical and managerial skills in the management of land resources for sustainable development.
- v. Apply the principles of land use planning and land resources management as a healthy alternative to combat destructive exploitation of the land resource base.
- vi. Apply multidisciplinary approaches to plan, design, and execute relevant research in land resources management aspects.
- vii. Demonstrate scholarship in the discipline (critical thinking).
- viii. Demonstrate ability to conceptualize projects and apply problem-solving skills.

## COURSE STRUCTURE

### SEMESTER I

COURSE ANTE	COURSE TITLE	CONTACT HOURS			CREDITS
		Lect	Sem	Prac	
<b>CORE COURSES</b>					
AEA 101	Introductory agricultural economics	30	10	20	1.5
EE 101	Introductory sociology	15	30	0	1.0
ENV 101	Fundamentals of ecology and ecosystems	30	10	20	1.5
ENV 111	Introduction to meteorology	15	0	30	1.0
LRM 110	Introductory geomorphology	45	0	30	2.0
LRM 111	Introduction to remote sensing	20	0	20	1.0
LRM 112	Introduction to Geographic Information System (GIS)	20	0	20	1.0
<b>Total</b>		<b>175</b>	<b>50</b>	<b>140</b>	<b>9.0</b>
<b>ELECTIVE COURSES</b>					
MTH 104	General mathematics I	45	30	0	2.0
RD 105	Rural production systems	45	30	0	2.0
SC 100*	Communication skills I	45	30	0	0.0
<b>Total</b>		<b>135</b>	<b>90</b>	<b>0</b>	<b>4.0</b>
<b>Total Semester I</b>		<b>310</b>	<b>140</b>	<b>140</b>	<b>13.0</b>

### SEMESTER II

COURSE ANTE	COURSE TITLE	CONTACT HOURS			CREDITS
		Lect	Sem	Prac	
<b>CORE COURSES</b>					
EE 103	Introductory anthropology	30	0	0	1.0
LRM 113	Physiography and soils	45	0	30	2.0
LRM 114	Rural land use assessment	15	0	30	1.0
LRM 115	Legal aspects of agricultural land	15	30	0	1.0
MTH 106	Introductory statistics	45	0	30	2.0
SC 101	Communication skills II	45	30	0	2.0
<b>TOTAL CORE</b>		<b>195</b>	<b>60</b>	<b>90</b>	<b>9.0</b>
<b>ELECTIVE COURSES</b>					
CIM 104	Social-cultural implications of ICT	30	60	0	2.0
CIM 204	Managing information and communication systems	30	30	0	1.5
CIT 100*	Introduction to microcomputers	30	60	0	0.0
EE 105	Principles of administration and management	20	20	0	1.0
<b>TOTAL ELECTIVES</b>		<b>110</b>	<b>170</b>	<b>0</b>	<b>4.5</b>
<b>TOTAL SEMESTER II</b>		<b>305</b>	<b>230</b>	<b>90</b>	<b>13.5</b>
<b>TOTAL SEMESTER I &amp; II</b>		<b>615</b>	<b>370</b>	<b>230</b>	<b>26.5</b>

\* This course must be passed but does not contribute to the GPA

### SEMESTER III

COURSE ANTE	COURSE TITLE	CONTACT HOURS			CREDITS
		Lect	Sem	Prac	
<b>CORE COURSES</b>					
ABE 212	Surveying	30	0	60	2.0
IWE 315	Applied hydrology	30	0	30	1.0
IWE 321	Rainwater harvesting	15	0	30	1.0
LRM 210	Land resources inventory and survey methods	30	0	30	1.0
MTH 201	Biometry	45	30	0	2.0
RD 208	Rural conflicts and management	15	0	30	1.0
SS 201	Fundamentals of soil science	45	0	30	2.0
<b>TOTAL CORE</b>		<b>210</b>	<b>30</b>	<b>210</b>	<b>10.0</b>
<b>ELECTIVE COURSES</b>					
CIT 200	Computing applications	45	30	0	2.0
EE 202	Extension methods	30	60	0	2.0
SC 100*	Communication skills I	45	30	0	0.0
WLM 212	Conservation of wetlands	20	0	20	1.0
<b>TOTAL ELECTIVES</b>		<b>140</b>	<b>120</b>	<b>20</b>	<b>5.0</b>
<b>TOTAL SEMESTER III</b>		<b>350</b>	<b>150</b>	<b>230</b>	<b>15.0</b>

\* This course must be passed but does not contribute to the GPA

### SEMESTER IV

COURSE ANTE	COURSE TITLE	CONTACT HOURS			CREDITS
		Lect	Sem	Prac	
<b>CORE COURSES</b>					
CS 204	Principles of agronomy	45	0	30	2.0
LRM 211	Remote sensing for land resources assessment	30	0	60	2.0
LRM 212	Principles of land evaluation	20	0	20	1.0
LRM 213	Soil mechanics	15	0	30	1.0
LRM 214	GIS for land resources management	15	0	30	1.0
LRM 215	Integrated water resources management	20	20	0	1.0
LRM 300	Research methods and research project I	15	30	0	1.0
RD 205	Public policies	45	30	0	2.0
<b>TOTAL CORE</b>		<b>205</b>	<b>80</b>	<b>170</b>	<b>11.0</b>
<b>ELECTIVE COURSES</b>					
ABE 219	Computer programming	30	0	60	2.0
AEA 209	Economic survey methods	20	0	20	1.0
AEA 210	Agribusiness and entrepreneurship development	30	30	30	2.0
EE 209	Introduction to social research	30	60	0	2.0
ENV 206	Climatology	15	30	0	1.0
FBL 205	Agro forestry	45	0	30	2.0
<b>TOTAL ELECTIVES</b>		<b>170</b>	<b>120</b>	<b>140</b>	<b>10.0</b>
<b>TOTAL SEMESTER IV</b>		<b>375</b>	<b>200</b>	<b>310</b>	<b>21.0</b>
<b>TOTAL SEMESTER III &amp; IV</b>		<b>725</b>	<b>350</b>	<b>540</b>	<b>36.0</b>

## SEMESTER V

COURSE ANTE	COURSE TITLE	CONTACT HOURS			CREDITS
		Lect	Sem	Prac	
<b>CORE COURSES</b>					
IWE 413	Soil and water conservation	30	0	60	2.0
LRM 310	Land evaluation systems and land suitability classification	30	0	30	1.5
LRM 311	Land use planning and management	30	10	20	1.5
LRM 313	Methods for erosion surveys and conservation	45	0	30	2.0
LRM 314	Resource planning and management	15	0	30	1.0
LRM 400	Research project II	0	20	100	2.0
<b>TOTAL CORE</b>		<b>150</b>	<b>30</b>	<b>270</b>	<b>10.0</b>
<b>ELECTIVE COURSES</b>					
HE 315	Livelihood analysis	20	20	0	1.0
LRM 315	Spatial decision support systems	50	20	0	2.0
RD 211	Laws and development	15	30		1.0
SC 100*	Communication skills I	45	30	0	0.0
<b>TOTAL ELECTIVES</b>		<b>130</b>	<b>100</b>	<b>0</b>	<b>4.0</b>
<b>TOTAL SEMESTER V</b>		<b>280</b>	<b>130</b>	<b>270</b>	<b>14.0</b>

## SEMESTER VI

COURSE ANTE	COURSE TITLE	CONTACT HOURS			CREDITS
		Lect	Sem	Prac	
<b>CORE COURSES</b>					
ABE 331	Irrigation and drainage systems	30	0	0	1.0
ENV 306	Environmental impact assessment	45	0	30	2.0
ENV 309	Global climate change and disaster management	45	0	30	2.0
LRM 316	Landscape planning and analysis	15	0	30	1.0
LRM 317	Land economics and valuation	20	20	0	1.0
LRM 400	Research project III	0	20	70	1.5
RD 309	Appraisal, monitoring and evaluation of rural development programmes/projects	45	30	0	2.0
<b>TOTAL CORE</b>		<b>200</b>	<b>70</b>	<b>160</b>	<b>10.5</b>
<b>ELECTIVE COURSES</b>					
ABE 422	Financial and human resource management	20	20	0	1.0
FBL 303	Integrated watershed management	45	0	30	2.0
RD 303	Rural development planning	45	30	0	2.0
RM 302	Pastoralism, human-environment interaction and indigenous knowledge	20	20	0	1.0
<b>TOTAL ELECTIVES</b>		<b>130</b>	<b>70</b>	<b>30</b>	<b>6.0</b>
<b>TOTAL SEMESTER VI</b>		<b>330</b>	<b>140</b>	<b>190</b>	<b>16.5</b>
<b>TOTAL SEMESTER V &amp; VI</b>		<b>610</b>	<b>270</b>	<b>460</b>	<b>30.5</b>

## PRACTICAL TRAINING (PT)

LEVEL OF PRACTICAL TRAINING	DURATION (Weeks)	TIMING	ACTIVITIES TO BE UNDERTAKEN
PT 1	5	After the 2 <sup>nd</sup> semester	<ul style="list-style-type: none"> <li>• Techniques of land resources inventory for land use planning</li> <li>• Identify appropriate methods for soil and water conservation</li> </ul>
PT 2	5	After the 4 <sup>th</sup> semester	<ul style="list-style-type: none"> <li>• Participatory land use planning</li> <li>• Appraise alternative land uses and select best land use options</li> <li>• Identify and plan erosion conservation measures</li> <li>• Carry out rehabilitation of the degraded lands</li> </ul>
PT 3	2	As a group in the last 2 weeks of the 6 <sup>th</sup> semester	<ul style="list-style-type: none"> <li>• Conduct environmental impact assessment, Assess hazards and disaster management</li> <li>• Develop appropriate land management options and identify strategies for carrying out land resource management and improvement options</li> </ul>

## **PRINCIPAL LEARNING OUTCOMES**

### **A Knowledge and Understanding**

On successful completion of the degree programme, students should be able to demonstrate knowledge and understanding of:

- A1 Essential concepts, theories and principles of land resources and its underpinning science.
- A2 Physical, chemical and biological processes of the biosphere.
- A3 importance of spatial technologies for analysing geographic data related to land resources.
- A4 Principles of land resources survey.
- A5 Principles of land evaluation for land use planning and management
- A6 Principles of utilisation and conservation of land resources.
- A7 Principles and dynamics of ecology as applied to human, plant and animal communities.
- A8 Matters of governance in interpretation and implementation of land use plans and conservation of land resources.
- A9 Importance of conflict management in land use
- A10 Contemporary issues

### **Teaching Strategy**

A variety of teaching methods will be used, including small group teaching, supervised study, tutorial sessions, seminars, presentations, invited speakers and discussion groups, lectures, practical classes and demonstrations. One-on-one supervision of a literature review, a mini-project and a dissertation by a single tutor is designed to promote continuity in the learning experiences provided. Computer software packages are also used.

### **Learning Strategy**

Students are encouraged to contribute to their own learning experience by independent reading. They are provided with reference books, compendia, scientific papers and other learning materials to enhance their understanding of specific subject areas. Group work exercises encourage a collective approach and responsibility for gathering knowledge and sharing of understanding.

### **Assessment strategy**

Primarily assessed by a combination of examinations (essay-type questions, written tests and semester examinations, problem solving) and partly by way of projects, coursework and case studies.

### **B Practical Skills**

On successful completion of the degree programme, students should be able to:

- B1. Plan, conduct and present an independent investigation with limited reliance on guidance.
- B2. Competently and safely use appropriate laboratory and field equipment.
- B3. Select and apply a range of appropriate methods to solve problems.
- B4. Logically interpret land resources data.
- B5. Use spatial techniques in addressing land resources problems effectively.
- B6. Develop project and business plans.
- B7. Carry out land evaluation.

### **Teaching Strategy**

Professional/practical skills relevant to land resources management will be demonstrated in specific lectures, seminars, laboratories, computing sessions, field visits, field practical training, and individual and group project work. Data handling is introduced in lectures and tutorials and developed through exercises and tutorial sessions, while the development and appraisal of management strategies is

supported through case studies and appropriate exercises.

### **Learning Strategy**

Students acquire skills through hands-on practical experience, a variety of problem or case study based exercises, field practical training and through application of appropriate techniques to their field of study. The latter presents a less-structured and more creative learning opportunity that requires greater exercise of judgment on the part of the learner.

### **Assessment strategy**

Practical skills are assessed by way of examinations and coursework, including applied case studies, report writing presentations and field class exercises.

## **C Intellectual/Cognitive Skills**

**On successful completion of the degree programme, students should be able to:**

- C1. Correctly apply concepts, theories and principles of land evaluation in solving land resources related problems.
- C2. Evaluate the legal and planning framework applicable to the rural environments.
- C4. Analyse the social factors which influence the use of land resources and identify the relative importance of different factors in particular situations.
- C6. Apply a range of methods to problem evaluation and amelioration.
- C7. Critically appraise academic literature and other sources of land resources information.
- C8. Analyse, summarize and evaluate land resources information.
- C9. Develop and implement land use plans.
- C10. Manage land use conflicts.

### **Teaching Strategy**

Seminars will provide the main opportunity for students to evaluate evidence and formulate objective and coherent arguments (C1-C10). Problem solving skills will be developed in tandem with the range of activities described above that are designed to develop their practical skills.

### **Learning Strategy**

Students learn through special project problem solving, handling data and discussion. Students are encouraged to justify opinions through discussion, oral presentations and in their special study research projects where they practice the production of reasoned arguments and logical conclusions.

### **Assessment strategy**

Intellectual skills are assessed by assignments, oral presentations, case studies and special study. Literature reviews are produced to enable both formative and summative assessment.

## **D Key/Transferable skills**

On successful completion of the degree programme, students should be able to:

- D1. Effectively use information technology (IT).
- D2. Effectively communicate with target audience.
- D3. Work independently, through managing own learning, time management, showing initiative and adaptability.
- D4. Work successfully as a member of a multidisciplinary team.
- D5. Develop informed, logical and justified opinions.

### **Teaching Strategy**

IT skills are introduced early in programme within skills or knowledge-based modules and may be further developed and practiced in other modules later in the course. Also, students have the opportunity to develop further work and study skills through optional modules and practiced through a range of individual and group presentations.

### **Learning Strategy**

Students learn through the production of essays, case study exercises, oral presentations and critiques of written materials. Emphasis is placed on effective study habits and time management throughout the programme.

### **Assessment strategy**

These skills are assessed through the production of coursework, final research project report, special study, and oral presentations using appropriate audio visual technologies

### **ATTRIBUTES OF THE GRADUATES**

As a result, graduates of the Land Resources Management programme should be able to work in one or a combination of the following areas:

- i. Government, environmental institutes, private sector and programmes dealing with environmental issues, and natural resources conservation.
- ii. Non-Governmental Organisations in the natural resources conservation sector.
- iii. Self employment in own land or farm related enterprises.
- iv. Teaching and research institutions as researchers, teachers/tutors/trainers and consultants in areas related to land use planning and natural resource management; design, monitoring and evaluation of programmes and projects.

### **DURATION OF THE DEGREE PROGRAMME**

In accordance with the semester guidelines and standards, the duration for the BSc (Land Resources Management) degree programme shall be six semesters covering three years for full time students and up to twelve semesters (six years) for part time students.

## **7. ADMISSION REQUIREMENTS**

In addition to the minimum admission requirements for first degree courses at SUA, applicants to the degree programme in Land Resources Management must:

### **a) 'A' level candidates (Direct Entrants)**

Possess Principal level passes in Physics/Chemistry/Biology/Botany/Zoology/Mathematics/Geography/Agriculture **AND** at least a pass in Science Subjects in the Ordinary Level Certificate of Secondary Education Examination or an Equivalent Examination

**The sum of the points from the principal level passes should not be less than 4.0.**

### **b) Mature Entrants**

Possess a Diploma in a relevant field of Physical, Chemical and Biological sciences such as Agriculture, Irrigation, Livestock Management, Range Management, Forestry, Beekeeping Wildlife Management, or Land Survey from recognized colleges passed with at least a credit and must have a pass in Science Subjects in the Ordinary Level Certificate of Secondary Education Examination.

### **SPECIAL EXAMINATION REGULATIONS**

#### **a). General Regulations**

In addition to the general university examination regulations for undergraduate degree programmes at SUA, the following regulations will apply for the Bachelor of Science in Land Resources and Environmental Management degree programme.



- (i) Students' performance shall be assessed continuously throughout the semester. Such continuous assessment shall include at least one test per each credit hour of a course in a semester and may also consist of laboratory reports, assignments, etc.
- (ii) The overall pass mark shall be 50% for all examinations.
- (iii) Each candidate shall be required to undertake a Research Project, whose report shall be completed and submitted for examination at least two weeks before the start of the final Semester examinations. Research projects shall be conducted in the last three semesters. A candidate failing in the Research Project shall not be allowed to graduate until he/she passes it.
- (iv) Each candidate shall be required to undertake Field Practical Training (FPT) during the long break at the end of the second and fourth semesters and during the sixth semester. Each FPT shall be assessed and shall form part of the assessment of the respective succeeding semesters.
- (v) Where a candidate fails in Field Practical Training, guidelines for FPT assessment shall apply.
- (vi) A candidate who fails in a course that is assessed on a continuous assessment basis only shall be required to retake the failed course when it is next offered provided he/she does not fail in more than one third of the courses and his/her GPA is not less than 2.0.
- (vii) Courses that are offered by other Faculties and Institutes shall be governed by the regulations of the respective Faculty or Institute.

**b). Course Work and End of Semester Assessments**

- (i) Course work assessment for courses which do have laboratory practicals shall be done by giving students tests, essays, practicals and assignments and the assessment shall carry 60% of the final marks. The end of Semester examination shall comprise 40% of the marks.
- (ii) Course work assessment for courses which do not have laboratory practicals shall be done by giving students tests, essays, and assignments and the assessment shall carry 40% of the final marks. The end of Semester examination shall comprise 60% of the marks.
- (iii) For special project:
  - Students' seminar presentation shall carry 30% of the course grade.
  - Final written special project report will carry 70% of the course grade

**c). Special Rules**

- (i) A student will be expected to have a course load of at least 12 credits<sup>a</sup> for each of the semesters.
- (ii) In order to graduate, a student should have accumulated a minimum of 72 credits which will contribute 90% of the overall GPA and the remaining 10% will come from Field Practical Training (FPT).

**FIELD PRACTICAL TRAINING**

The Department of Agricultural Engineering and Land Planning shall be responsible for the organisation and running of the Field Practical Training at the end of the second and fourth semesters and during the sixth semester. The duration of each Field Practical Training session shall be five weeks for the second and fourth semester and 2 weeks for the sixth semester. The preparation and conduct of the Field Practical Training shall be done as follows:

**A. Preparation of Field Practical Training**

---

<sup>a</sup> A credit is equivalent to 30 lecture hours or 60 practical/seminar hours

- (i) The allocation of Field Practical Training places to students shall be undertaken by the Department of Agricultural Engineering and Land Planning. Training at a Field Practical Training place not approved and allocated by the Department before the start of training shall not be recognised.
- (ii) A list of Field Practical Training places shall be made available to students not later than five weeks before the end of the respective Semesters.
- (iii) The allocation of Field Practical Training places to students shall be completed not later than one week before the end of the respective Semesters.

**B. Guidelines for Field Practical Training Assessment**

- (i) Every Field Practical Training shall be treated as a subject of the succeeding Semester except the last FPT.
- (ii) Non completion of Field Practical Training shall lead to failure.
- (iii) Field Practical Training reports shall be handed in for assessment before the end of the second week of the succeeding Semester and marking completed before the end of that Semester.
- (iv) Candidates may be required to present themselves before the examiners for an oral examination.
- (v) A candidate who fails in a part of a Field Practical Training because of reasons other than (ii) or (iii) shall be allowed to carry it forward and retake the Field Practical Training in the particular part failed. If the candidate fails again, he/she will be required to repeat the training when it is next offered before proceeding to the next one or before he/she can be allowed to graduate.
- (vi) A candidate who fails in a Field Practical Training examination because of reasons mentioned in (ii) or (iii) shall be required to repeat the training when it is next offered before proceeding to the next one or before he/she can be allowed to graduate.
- (vii) A candidate who fails after attempting a Field Practical Training twice shall be discontinued from studies.
- (viii) Students, who do not go to places allocated to them for Field Practical Training without satisfactory reasons shall be deemed to have absconded from FPT and shall as a result, be discontinued from their studies.

**WEIGHTING OF FINAL RESULTS**

- (a) All assessed courses in the first to the last Semester shall count towards the final results.
- (b) The weighting of the examinations' grade shall be as follows:
  - (i) The total weight shall be 1.0
  - (ii) The total weight factor of the three Field Practical Training sessions shall be 0.1
  - (iii) The total weight factor for all the subjects including the Special Project shall be 0.9. The weight of each subject contributing to this weight factor shall be proportional to the number of credits for the respective course.
- (c) The grading system shall be as follows:

Grade	Range of Marks	Equation	Grade point	Description
A	70 - 100%	$Y = 0.02X + 3$	(4.4 – 5.0)	Excellent
B+	65 - 69%	$Y = 0.08X - 1.2$	(4.0 – 4.3)	Very good
B	60 - 64%	$Y = 0.2X - 9$	(3.0 – 3.9)	Good
C	50 - 59%	$Y = 0.1X - 3$	(2.0 – 2.9)	Satisfactory
D	40 - 49%	$Y = 0.1X - 3$	(1.0 – 1.9)	Marginal fail
E	0 - 39%	$Y = (0.025)X$	(0 – 0.9)	Absolute fail

Where Y = Grade point; X = Raw marks (%)

Regarding Grade Point Average (GPA), this should be calculated on the basis of weight (credits) of the courses taken.

(d) Classification of Degrees

The final degree classification shall be as follows:

<b>Class</b>	<b>Grade</b>	<b>GPA range</b>
First Class	A	4.4 - 5.0
Upper Second	B+	3.5 - 4.3
Lower Second	B	2.7 - 3.4
Pass	C	2.0 - 2.6