DOCUMENT RESUME

ED 361 586 CE 064 599

TITLE	Range Management and Ecology. Curriculum Guide for Agriscience 382.
INSTITUTION	Texas A and M Univ., College Station. Dept. of Agricultural Education.
SPONS AGENCY	Texas Education Agency, Austin. Div. of Vocational and Applied Technology Education.
PUB DATE	Jan 92
NOTE	34p.
AVAILABLE FROM	Instructional Materials Service, Texas A&M University, F.E. Box 2588, College Station, TX 77843-2588.
PUB TYPE	Guides - Classroom Use - Teaching Guides (For Teacher) (052)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Agribusiness; *Agricultural Education; Agricultural Skills; Agricultural Trends; Behavioral Objectives; Career Education; *Competence; Competency Based Education; Conservation (Environment); Course Content; *Ecology; Educational Resources; *Farm Management; High Schools; Leadership Training; State Curriculum Guides; Supervised Occupational Experience (Agriculture); Teaching Methods; Vocational Education
IDENTIFIERS	Texas

ABSTRACT

This curriculum guide provides materials for teachers to use in developing a course in "Range Management and Ecology, Agriscience 382," one of 28 semester courses in agricultural science and technology for Texas high schools. This introductory course is designed to acquaint students with the ecology and management of native rangeland for the benefit of animals and plants. Technical skills are developed in the areas of renewable natural resources, plant kinds and values, ecosystems, water cycles, animal stocking capacities and limitations, productivity and improvement, and research related to native rangeland. Additional skills are developed for safe work practices, recordkeeping, career exploration, and leadership. The guide is organized in four sections. The first section lists essential elements common to all agricultural science and technology courses. The second section lists essential elements specific to this course. The third section lists the units and topics of instruction and suggested time allocations for each unit and topic. Listed also are the catalog numbers of corresponding curriculum materials available from the Instructional Materials Service of Texas A&M University. The final section provides topic goals and objectives targeted for the completion of the topic. (KC)

CURRICULUM GUIDE
FOR
AGRISCIENCE 382

RANGE MANAGEMENT
AND ECOLOGY

Developed In Consultation With

DEPARTMENT OF RANGELAND MANAGEMENT AND ECOLOGY

TEXAS A & M UNIVERSITY

COLLEGE STATION, TEXAS

In Cooperation With

TEXAS EDUCATION AGENCY

OCCUPATIONAL EDUCATION AND TECHNOLOGY

AUSTIN, TEXAS

Printed and Distributed By

INSTRUCTIONAL MATERIALS SERVICE

DEPARTMENT OF AGRICULTURAL EDUCATION

TEXAS A & M UNIVERSITY

COLLEGE STATION, TEXAS

JANUARY 1992

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

Special thanks are extended to the members of the Agriscience 382 Curriculum Advisory Committee for assistance in developing the units and topics of instruction for the course.

Thomas Behrens
Teacher of Agriscience
San Saba High School

D. Lynn Drawe, Ph.D.
Assistant Director
Welder Wildlife Foundation

John Kearney
Teacher of Agriscience
Sterling City High School

George Martin
Teacher of Agriscience
Iowa Park High School

Joseph L. Schuster, Ph.D.
Professor and Head
Department of Rangeland Management and Ecology
Texas A&M University

* *

Adrian Knight, Graduate Assistant,
Department of Agricultural Education, Texas A&M University,
developed the goals and objectives listed in this curriculum guide.

Lee Thornhill and Brian Thomas Cox, Graduate Assistants,
Department of Rangeland Ecology and Management, Texas A&M University,
developed the student materials to complement this curriculum guide.

The Faculty and Staff of the
Department of Rangeland Ecology and Management, Texas A&M University,
reviewed this curriculum guide and materials complementing its use.

Larry Ermis, Curriculum Materials Specialist,
Instructional Materials Service, Texas A&M University,
edited this curriculum guide and materials complementing its use.

USING THE
CURRICULUM GUIDE
FOR
AGRISCIENCE 382

RANGE MANAGEMENT AND ECOLOGY

Agriscience 382 - Range Management and Ecology, one of the experimental Agricultural Science and Technology semester courses, is for students in grades 10 - 12 in public secondary schools. It is a general course designed to familiarize the student with a description, the ecology, and the management of native rangeland for the benefit of animals and plants. Technical skills are developed in the areas of renewable natural resources, plant kinds and values, ecosystems, water cycles, animal stocking capacities and limitations, productivity and improvement, and research as related to native rangeland. Additional skills are developed for safe work practices, recordkeeping, career exploration, and leadership. Although the primary purpose in developing this guide was to assist the teacher in presenting the course, it may be used in other ways.

Pages one and two of this guide include a list of essential elements common to all vocational courses. A list of essential elements specific to the course is on page three.

Pages four through six of this guide contain a list of units and topics of instruction and suggested time allocations for each unit and topic. Listed also are catalog numbers of Instructional Materials Service (IMS) curriculum materials that may be used in teaching topics and satisfying essential element requirements. More than one suggested item of curriculum materials may be listed for effective instructional presentation of some topics. If all suggested curriculum materials listed are used, the essential element requirements of the course will be met.

The next section (pages 7 - 24) in the guide provides the goal and objectives to be met upon completion of each topic. This section should be particularly useful to teachers in preparing lesson plans.

Each student material topic contains a list of references used in its development. If a more detailed presentation of subject matter is necessary, the teacher may acquire some of these references from IMS and/or the publishers cited in the reference section of each topic.

ESSENTIAL ELEMENTS COMMON TO ALL AGRICULTURAL SCIENCE AND TECHNOLOGY COURSES

S_S75.82 Agricultural Science and Technology

(a) The elements in this subsection are common to all agricultural science and technology courses unless otherwise indicated and shall be included in each course at the appropriate level. Every school offering agricultural science and technology shall provide courses which include the following essential elements:

(1) Leadership concepts and skills. The student shall be provided opportunities to:

(A) demonstrate skills, characteristics and responsibilities of leaders and effective group members;

(B) demonstrate a knowledge of parliamentary procedure principles;

(C) plan and conduct leadership activities; and

(D) prepare for effective citizenship and participation in our democratic society.

(2) Concepts and skills related to successful employment and/or post secondary training. The student shall be provided opportunities to:

(A) identify employment opportunities and preparation requirements in chosen field;

(B) identify effective methods to secure and terminate employment;

(C) demonstrate effective communication skills, both oral and written, and follow through on assigned tasks;

(D) demonstrate dependability and punctuality;

(E) demonstrate productive work habits and attitudes;

(F) understand the importance of taking pride in the quality of work performed;

(G) recognize the dignity in work;

(H) develop skills in planning and organizing work;

(I) apply required methods and sequences when performing tasks;

(J) apply principles of time management and work simplification when performing assigned tasks;

(K) identify ethical practices and responsibilities; and

(L) understand the importance of the application of organizational policies and procedures.

(3) Concepts and skills associated with entrepreneurship. The student shall be provided opportunities to:

(A) identify opportunities for business ownership;

(B) understand the risk and profit motive factor;

(C) understand the elements and advantages of the free enterprise system; and

(D) explain the role of small business in the free enterprise system.

(4) Concepts and skills related to safety and safe working conditions. The student shall be provided opportunities to identify and apply safe working practices to all training situations.

(5) Concepts and skills associated with human relations and personality development. The student shall be provided opportunities to:

(A) understand the importance of maintaining good health and proper appearance for effective job performance;

(B) understand oneself and others;

(C) exercise self-control;

(D) accept and use criticism;

(E) recognize basic human relationships as they relate to business success; and

(F) demonstrate characteristics for successful working relationships.

(6) Concepts and skills related to personal and business management. The student shall be provided opportunities to:

(A) explain how management assists in reaching personal and family goals;

(B) explain the management process;

(C) describe the role of management in controlling stress;

(D) identify and understand personal checking accounts;

(E) identify and understand personal loan application processes;

(F) identify and understand different financial institutions;

(G) identify the role and functions of business management;

(H) understand the lines of authority; and

(I) identify effective supervisory techniques.

(7) Concepts and skills related to supervised agricultural activities. The student shall be provided opportunities to plan and conduct/perform supervised agricultural activities.

ESSENTIAL ELEMENTS FOR AGRISCIENCE 382

S_S75.82 Agricultural Science and Technology

Agricultural Science 382 - Range Management and Ecology (1/2 unit) shall be a shop/laboratory-oriented course that includes the essential elements and the concepts and skills related to range management and ecology. The student shall be provided opportunities to:

(1) explore the significance of native rangeland as a renewable natural resource with many products and uses;

(2) identify range plants and their importance;

(3) examine the rangeland ecosystem;

(4) describe the water cycle on rangeland;

(5) recognize capacities and limitations of rangelands;

(6) practice livestock management on rangeland;

(7) practice rangeland management for wildlife;

(8) identify methods of improving rangelands for livestock and wildlife;

(9) identify research in range management and ecology.

AGRISCIENCE 382 - RANGE MANAGEMENT AND ECOLOGY

Units and Topics of Instruction	Periods of Instruction	Essential Elements	Materials Teacher - Student
A. Explore the Significance of Native Rangeland as a Renewable Natural Resource with Many Products and Uses	12		
1. Rangelands of North America and Their Management Needs	2	(1)	8869-A
2. Importance of Rangeland to the Environment	3	(1)	8869-B
3. Rangeland - Water Producer for Everyone	1	(1)	8869-C
4. Recreational and Alternative Uses of Rangeland	2	(1)	8869-D
5. Rangeland Carrying Capacity and World Population Growth	4	(1)	8869-E
B. Identify Range Plants and Their Importance	7		
1. Identification and Classification of Range Plants	3	(2)	8870-A
2. Value of Selected Range Grasses to Livestock and Wildlife	4	(2)	8870-B
C. Examine the Rangeland Ecosystem	10		
1. Rangeland Ecology: Principles of Ecology	2	(3)	8871-A
2. Rangeland Ecology: Photosynthesis and Energy Flow	3	(3)	8871-B
3. Rangeland Ecology: Composition and Functions of an Ecosystem	3	(3)	8871-C
4. Rangeland Ecology: Climax Vegetation and Plant Successional Types	2	(3)	8871-D
D. Describe the Water Cycle on Rangeland	3		
1. Rangeland and the Water Cycle	1	(4)	8872-A
2. Effects of Stocking Rates and Other Management Practices on Soil and Water Resources of Ranges	2	(4)	8872-B
E. Recognize Capacities and Limitations of Rangelands	8		
1. Range Inventory and Utilization Techniques	2	(5)	8873-A
2. Determining Range Condition and Carrying Capacity	3	(5)	8873-B
3. Influence of Rangeland Stocking Rates on Forage, Livestock, and Wildlife Production	3	(5)	8873-C

Units and Topics of Instruction	Periods of Instruction	Essential Elements	Materials Teacher - Student
F. Practice Livestock Management on Rangeland	10		
1. Nutritional Needs of Livestock on Rangeland	2	(6)	8874-A
2. Livestock Grazing Management Principles	2	(6)	8874-B
3. Types of Livestock Grazing Systems	6	(6)	8874-C
G. Practice Rangeland Management for Wildlife	6		
1. Wildlife Habitat Needs on Rangeland	4	(7)	8875-A
2. Range Condition and Wildlife Habitat Relationships	2	(7)	8875-B
H. Identify Methods of Improving Rangelands for Livestock and Wildlife Production	10		
1. Managing Undesirable Plants on Rangeland	2	(8)	8876-A
2. Rangeland Practices to Enhance Livestock and Wildlife Production	6	(8)	8876-B
3. Accelerating Rangeland Improvements for Productivity	2	(8)	8876-C
I. Identify Research in Range Management and Ecology	2		
1. Research and Development in Range Management and Ecology	1	(9)	8877-A
2. Classroom and Laboratory Applications of Research and Development in Range Management and Ecology	1	(9)	8877-A
J. Recognize Safe Work Practices That Apply to Range Management	2		
1. Identification of Personal Safety Measures in Range Management and Ecology	1	(a)(4)	8878-A
2. Use of Safe Work Practices in Range Management and Ecology	1	(a)(4)	8878-A
K. Manage Records Related to Range Management	4		
1. Maintenance of Records Related to Range Management and Ecology	2	(a)(6)(A-I), (a)(7)	8001-8002D,8502 SAEP-E,SAEP-G, SAEP-J,382-A,382-S
2. Analysis of Records Related to Range Management and Ecology	2	(a)(6)(A-I), (a)(7)	8001-8002D,8502 SAEP-E,SAEP-G, SAEP-J,382-A,382-S

Units and Topics of Instruction	Periods of Instruction	Essential Elements	Materials Teacher - Student
L. Explore Career Opportunities in Range Management and Ecology	2		
1. Careers in Range Management and Ecology	1	(a)(2)(A-L), (a)(3)(A-D)	8880-A 1050,2902
2. Activities of a Professional Range Conservationist	1	(a)(2)(A-L), (a)(3)(A-D)	1050,2902
M. Plan and Conduct Leadership Activities Related to Range Management and Ecology	4		
1. Leadership Skills Related to Livestock Production on Rangelands	1	(a)(1)(A-D), (a)(5)(A-F)	4850 series 8003-8004A
2. Leadership Skills Related to Wildlife Production and Recreational Uses of Rangelands	1	(a)(1)(A-D), (a)(5)(A-F)	4850 series 8003-8004A
3. Leadership Activities Related to Range Management and Ecology	2	(a)(1)(A-D), (a)(5)(A-F)	4850 series 8003-8004A

GOALS

AND

OBJECTIVES

FOR

TOPICS

IN

AGRISCIENCE 382

UNIT A
EXPLORE THE SIGNIFICANCE OF NATIVE RANGELAND AS A RENEWABLE NATURAL RESOURCE WITH MANY PRODUCTS AND USES

Topic A1: Rangelands of North America and Their Management Needs

Topic Goal:

The student shall be provided the opportunity to recognize the characteristics and management needs of the North American rangelands as a means of exploring the significance of native rangeland as a renewable natural resource with many products and uses.

Topic Objectives:

After completing the topic, the student shall be able to:

1. using a map, locate geographic locations of types of rangelands used for livestock production in the United States;
2. describe the general types of rangeland;
3. compare and contrast characteristics of individual range areas within the general types of rangeland;
4. explain the role of plant and animal science in range management;
5. discuss the basic concepts of range management; and
6. recognize the increasing need for range managers as the population grows larger;

Topic A2: Importance of Rangeland to the Environment

Topic Goal:

The student shall be provided the opportunity to examine the importance of rangeland to the environment as a means of exploring the significance of native rangeland as a renewable natural resource with many products and uses.

Topic Objectives:

After completing the topic, the student shall be able to:

1. recognize the increasing importance of water;
2. describe the relationship between minerals and rangeland;
3. discuss the reactions of rangeland to animals and society;
4. list reasons for the range manager's major concern of soil loss; and
5. analyze the maintenance of balance among forage, soil, and water.

Topic A3: Rangeland - Water Producer for Everyone

Topic Goal:

The student shall be provided the opportunity to examine the importance of rangeland in the water production process as a means of exploring the significance of native rangeland as a renewable natural resource with many products and uses.

Topic Objectives:

After completing the topic, the student shall be able to:

1. explain the effect of range management on water supplies;
2. describe the relationship between ground cover and water quality;
3. list the steps in the aquifer recharge process; and
4. identify major concerns associated with water availability.

Topic A4: Recreational and Alternative Uses of Rangeland

Topic Goal:

The student shall be provided the opportunity to evaluate various recreational and alternative uses of rangeland as a means of exploring the significance of native rangeland as a renewable natural resource with many products and uses.

Topic Objectives:

After completing the topic, the student shall be able to:

1. name and describe various types of recreational and alternative uses for rangeland; and
2. discuss benefits of alternative uses of rangeland.

Topic A5: Rangeland Carrying Capacity and World Population Growth

Topic Goal:

The student shall be provided the opportunity to examine carrying capacity and world population growth and their effects on rangeland as a means of exploring the significance of native rangeland as a renewable natural resource with many products and uses.

Topic Objectives:

After completing the topic, the student shall be able to:

1. indicate the influence of world population growth on the present and future responsibilities of range managers;
2. discuss demands placed on rangeland by a growing population;
3. explain effects of stocking rates on the quality of rangeland; and
4. describe the role of carrying capacity in maintaining and improving rangeland.

UNIT B
IDENTIFY RANGE PLANTS AND THEIR IMPORTANCE

Topic B1: Identification and Classification of Range Plants

Topic Goal:

The student shall be provided the opportunity to identify and classify various plants growing on rangeland as a means of identifying range plants and their importance.

Topic Objectives:

After completing the topic, the student shall be able to:

1. name the major parts of a grass plant;
2. identify different types of roots;
3. recognize different types of inflorescence;
4. explain methods of classifying plants;
5. describe the different plant categories concerning succession and climax; and
6. list the categories of range plants.

Topic B2: Value of Selected Range Plants to Livestock and Wildlife

Topic Goal:

The student shall be provided the opportunity to recognize the value of range plants to livestock and wildlife as a means of identifying range plants and their importance.

Topic Objectives:

After completing the topic, the student shall be able to:

1. discuss grazing values for various range grasses;
2. distinguish between native and introduced species of range grasses; and
3. classify range grasses as either warm-season or cool-season grasses.

UNIT C
EXAMINE THE RANGELAND ECOSYSTEM

Topic C1: Rangeland Ecology: Principles of Ecology

Topic Goal:

The student shall be provided the opportunity to analyze basic principles of ecology as a means of examining the rangeland ecosystem.

Topic Objectives:

After completing the topic, the student shall be able to:

1. describe the interactions of the biotic and abiotic components of an ecosystem;
2. name different types of growth forms of vegetation;
3. discuss factors of plant species relationships; and
4. differentiate between a macroenvironment and a microenvironment.

Topic C2: Rangeland Ecology: Photosynthesis and Energy Flow

Topic Goal:

The student shall be provided the opportunity to examine photosynthesis and energy flow as related to rangeland ecology as a means of examining the rangeland ecosystem.

Topic Objectives:

After completing the topic, the student shall be able to:

1. describe the major phases of the photosynthesis process;
2. diagram energy flow through an ecosystem;
3. explain energy loss through the food chain; and
4. write the photosynthesis equation for different "n" values.

Topic C3: Rangeland Ecology: Composition and Functions of an Ecosystem

Topic Goal:

The student shall be provided the opportunity to analyze the composition and functions of an ecosystem as a means of examining the rangeland ecosystem.

Topic Objectives:

After completing the topic, the student shall be able to:

1. describe the composition of an ecosystem;
2. discuss the roles of the biotic factors in an ecosystem;
3. list abiotic factors in ecosystems; and
4. illustrate an ecosystem for a rangeland community.

Topic C4: Rangeland Ecology: Climax Vegetation and Plant Successional Types

Topic Goal:

The student shall be provided the opportunity to recognize the importance of climax vegetation and plant successional types to rangeland ecology as a means of examining the rangeland ecosystem.

Topic Objectives:

After completing the topic, the student shall be able to:

1. explain the concept of climax vegetation;
2. discuss changes occurring in seral communities;
3. differentiate between intraspecific competition and interspecific competition; and
4. summarize the different types of plant succession.

UNIT D
DESCRIBE THE WATER CYCLE ON RANGELAND

Topic D1: Rangeland and the Water Cycle

Topic Goal:

The student shall be provided the opportunity to examine the relationship between rangeland and the water cycle as a means of describing the water cycle on rangeland.

Topic Objectives:

After completing the topic, the student shall be able to:

1. discuss the water cycle;
2. explain the importance of well-managed rangelands within watersheds;
3. describe factors affecting water infiltration rates; and
4. identify management practices to reduce water runoff and soil erosion.

Topic D2: Effects of Stocking Rates and Other Management Practices on Soil and Water Resources of Ranges

Topic Goal:

The student shall be provided the opportunity to recognize the impact of stocking rates and other management practices on soil and water resources of ranges as a means of describing the water cycle on rangeland.

Topic Objectives:

After completing the topic, the student shall be able to:

1. describe effects of stocking rates on soil and water resources;
2. explain effects of different grazing systems on water infiltration; and
3. discuss effects of various management practices on soil and water resources.

UNIT E
RECOGNIZE CAPACITIES AND LIMITATIONS OF RANGELANDS

Topic E1: Range Inventory and Utilization Techniques

Topic Goal:

The student shall be provided the opportunity to recognize the importance of range inventory and utilization techniques as a means of recognizing capacities and limitations of rangelands.

Topic Objectives:

After completing the topic, the student shall be able to:

1. describe factors used to measure forage production;
2. calculate the diversity index for a given range site; and
3. explain methods of measuring forage utilization.

Topic E2: Determining Range Condition and Carrying Capacity

Topic Goal:

The student shall be provided the opportunity to examine the importance of determining range condition and carrying capacity as a means of recognizing capacities and limitations of rangelands.

Topic Objectives:

After completing the topic, the student shall be able to:

1. explain the relationship between carrying capacity and range condition; and
2. discuss the importance of a ranch management plan for maintaining range condition.

Topic E3: Influence of Rangeland Stocking Rates on Forage, Livestock, and Wildlife Production

Topic Goal:

The student shall be provided the opportunity to examine the influence of rangeland stocking rates on forage, livestock, and wildlife production as a means of recognizing capacities and limitations of rangelands.

Topic Objectives:

After completing the topic, the student shall be able to:

1. describe influence of stocking rates on forage production;
2. recognize aspects of light, medium, and heavy stocking rates in relation to forage production;
3. summarize influence of stocking rates on wildlife; and
4. discuss factors affecting stocking rates.

UNIT F
PRACTICE LIVESTOCK MANAGEMENT ON RANGELAND

Topic F1: Nutritional Needs of Livestock on Rangeland

Topic Goal:

The student shall be provided the opportunity to examine the nutritional needs of livestock on rangeland as a means of practicing livestock management on rangeland.

Topic Objectives:

After completing the topic, the student shall be able to:

1. explain effect of forage quality on livestock supplementation;
2. discuss variations in forage qualities occurring during a year;
3. describe various supplementation practices; and
4. differentiate between fat-soluble and water-soluble vitamins.

Topic F2: Livestock Grazing Management Principles

Topic Goal:

The student shall be provided the opportunity to investigate principles of livestock grazing management as a means of practicing livestock management on rangeland.

Topic Objectives:

After completing the topic, the student shall be able to:

1. explain the principles of common-use grazing;
2. list items considered in planning locations of watering facilities;
3. describe practices for correcting grazing distribution problems;
4. list advantages of grazing systems; and
5. discuss the relationship between stocking rates and droughts.

Topic F3: Types of Livestock Grazing Systems

Topic Goal:

The student shall be provided the opportunity to examine various livestock grazing systems as a means of practicing livestock management on rangeland.

Topic Objectives:

After completing the topic, the student shall be able to:

1. describe various types of grazing systems;
2. list advantages and disadvantages of various grazing systems; and
3. discuss the main ideas promoting use of a specific grazing system.

UNIT G
PRACTICE RANGELAND MANAGEMENT FOR WILDLIFE

Topic G1: Wildlife Habitat Needs on Rangeland

Topic Goal:

The student shall be provided the opportunity to recognize wildlife habitat needs on rangeland as a means of practicing rangeland management for wildlife.

Topic Objectives:

After completing the topic, the student shall be able to:

1. discuss food and water needs of various wildlife species;
2. describe the cover needed by various wildlife species; and
3. recognize management decisions of range managers concerning wildlife habitats.

Topic G2: Range Condition and Wildlife Habitat Relationships

Topic Goal:

The student shall be provided the opportunity to examine range condition and wildlife habitat relationships as a means of practicing rangeland management for wildlife.

Topic Objectives:

After completing the topic, the student shall be able to:

1. explain the relationship between range condition and habitat;
2. recognize the importance of wildlife management to the rancher;
3. describe the results of an overpopulation of deer; and
4. discuss the importance of a wildlife management plan to the range manager.

UNIT H
IDENTIFY METHODS OF IMPROVING RANGELANDS FOR LIVESTOCK AND WILDLIFE PRODUCTION

Topic H1: Managing Undesirable Plants on Rangeland

Topic Goal:

The student shall be provided the opportunity to recognize methods of managing undesirable plants on rangeland as a means of identifying methods of improving rangelands for livestock and wildlife production.

Topic Objectives:

After completing the topic, the student shall be able to:

1. summarize mechanical methods of removing undesirable plants;
2. discuss chemical methods of removing undesirable plants;
3. list advantages and disadvantages of water and diesel fuel carriers for herbicides;
4. differentiate between maintenance burns and reclamation burns; and
5. describe the types of fires used in prescribed burning programs.

Topic H2: Rangeland Practices to Enhance Livestock and Wildlife Production

Topic Goal:

The student shall be provided the opportunity to examine rangeland practices to enhance livestock and wildlife production as a means of identifying methods of improving rangelands for livestock and wildlife production.

Topic Objectives:

After completing the topic, the student shall be able to:

1. discuss goals of a grazing system;
2. describe effects of prescribed burning on rangeland; and
3. explain factors considered prior to using chemical or mechanical treatments on rangeland.

Topic H3: Accelerating Rangeland Improvements for Productivity

Topic Goal:

The student shall be provided the opportunity to analyze methods of accelerating rangeland improvements for productivity as a means of identifying methods of improving rangelands for livestock and wildlife production.

Topic Objectives:

After completing the topic, the student shall be able to:

1. discuss objectives of seeding;
2. list requirements to consider in selecting a range plant species;
3. describe factors contributing to success or failure of the establishment of seedlings;
4. recognize common methods of seeding rangeland; and
5. differentiate between pitting and ripping.

UNIT I
IDENTIFY RESEARCH IN RANGE MANAGEMENT AND ECOLOGY

Topic I1: Research and Development in Range Management and Ecology

Topic Goal:

The student shall be provided the opportunity to recognize the importance of research and development in range management and ecology as a means of identifying research in range management and ecology.

Topic Objectives:

After completing the topic, the student shall be able to:

1. state the objective of research and development;
2. list steps in the scientific research process;
3. describe the importance of research to management; and
4. explain the relationship between research development and real-life management techniques.

Topic I2: Classroom and Laboratory Applications of Research and Development in Range Management and Ecology

Topic Goal:

The student shall be provided the opportunity to apply research and development practices related to range management and ecology as a means of identifying research in range management and ecology.

Topic Objectives:

After completing the topic, the student shall be able to:

1. select a range resource problem;
2. determine research needs for solving the problem;
3. formulate ideas for solving the problem; and
4. identify development research required to test ideas.

UNIT J
RECOGNIZE SAFE WORK PRACTICES THAT APPLY TO RANGE MANAGEMENT

Topic J1: Identification of Personal Safety Measures in Range Management and Ecology

Topic Goal:

The student shall be provided the opportunity to identify personal safety measures as a means of recognizing safe work practices that apply to range management.

Topic Objectives:

After completing the topic, the student shall be able to:

1. recognize the need for personal safety measures;
2. identify unsafe conditions and unsafe actions; and
3. dress appropriately for an occupation.

Topic J2: Use of Safe Work Practices in Range Management and Ecology

Topic Goal:

The student shall be provided the opportunity to use safe work practices as a means of recognizing safe work practices that apply to range management.

Topic Objectives:

After completing the topic, the student shall be able to:

1. name major types of chemicals used in range management and ecology;
2. practice safety measures in handling chemicals;
3. identify large machinery safety practices; and
4. recognize fire hazards and protection measures.

UNIT K
MANAGE RECORDS RELATED TO RANGE MANAGEMENT

Topic K1: Maintenance of Records Related to Range Management and Ecology

Topic Goal:

The student shall be provided the opportunity to examine methods of maintaining records related to range management and ecology enterprises as a means of managing records related to range management.

Topic Objectives:

After completing the topic, the student shall be able to:

1. discuss the importance of keeping accurate records;
2. describe major types of records to be kept;
3. determine kinds of supporting records to be kept; and
4. prepare management records for range management and ecology enterprises.

Topic K2: Analysis of Records Related to Range Management and Ecology

Topic Goal:

The student shall be provided the opportunity to examine methods of analyzing records related to range management and ecology enterprises as a means of managing records related to range management.

Topic Objectives:

After completing the topic, the student shall be able to:

1. explain information contained in records for range management enterprises;
2. interpret information contained in records for range management enterprises; and
3. prepare management decisions based upon analysis of information from records for range management enterprises.

UNIT L
EXPLORE CAREER OPPORTUNITIES IN RANGE MANAGEMENT AND ECOLOGY

Topic L1: Careers in Range Management and Ecology

Topic Goal:

The student shall be provided the opportunity to identify careers in range management and ecology as a means of exploring career opportunities in range management and ecology.

Topic Objectives:

After completing the topic, the student shall be able to:

1. name careers available in range management and ecology;
2. describe duties of various personnel in range management and ecology;
3. list employers hiring services of specialists in range management and ecology; and
4. identify sources of information concerning natural resource management and conservation.

Topic L2: Activities of a Professional Range Conservationist

Topic Goal:

The student shall be provided the opportunity to analyze the activities of a professional range conservationist as a means of exploring career opportunities in range management and ecology.

Topic Objectives:

After completing the topic, the student shall be able to:

1. describe duties of a range conservationist;
2. discuss the importance of a range conservationist; and
3. name sources of possible employment for range conservationists.

UNIT M
PLAN AND CONDUCT LEADERSHIP ACTIVITIES RELATED TO RANGE MANAGEMENT AND ECOLOGY

Topic M1: Leadership Skills Related to Livestock Production on Rangelands

Topic Goal:

The student shall be provided the opportunity to develop leadership skills necessary for active participation in organizations related to livestock production on rangelands as a means of planning and conducting leadership activities related to range management and ecology.

Topic Objectives:

After completing the topic, the student shall be able to:

1. recognize the importance of effective leadership skills;
2. identify livestock production leadership organizations;
3. become an active member of a leadership organization related to livestock production on rangelands; and
4. file for an office of a leadership organization related to livestock production on rangelands.

Topic M2: Leadership Skills Related to Wildlife Production and Recreational Uses of Rangelands

Topic Goal:

The student shall be provided the opportunity to develop leadership skills useful in professions related to wildlife production and recreational uses of rangelands as a means of planning and conducting leadership activities related to range management and ecology.

Topic Objectives:

After completing the topic, the student shall be able to:

1. identify leadership organizations related to wildlife production and recreational uses of rangeland;
2. recognize skills necessary for effective leadership in careers relating to wildlife production and recreational management;
3. become an active member of a leadership organization related to wildlife production and recreational uses of rangeland; and
4. file for an office in a leadership organization related to wildlife production and recreational uses of rangeland.

Topic M3: Leadership Activities Related to Range Management and Ecology

Topic Goal:

The student shall be provided the opportunity to practice leadership skills in range management and ecology related activities as a means of planning and conducting leadership activities related to range management and ecology.

Topic Objectives:

After completing the topic, the student shall be able to:

1. identify leadership organizations related to range management and ecology;
2. become an active member of a leadership organization related to range management and ecology; and
3. file for an office in a leadership organization related to range management and ecology.

IMS Instructional Materials Service

F.E. Box 2588
Texas A&M University
College Station, Texas 77843-2588

COLLEGE STATION · TEXAS 77843 ·

NONPROFIT ORG.
U. S. POSTAGE
PAID
PERMIT NO. 215

Instructional Materials Service