# Crop & Range Management Course No. 18081 Credit: 1.0

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| --- | --- | --- | --- |
| **Student name:**  |  | **Graduation Date:** |  |

Pathways and CIP Codes:Plant Systems (01.1101)

Course Description:

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Rangeland & Management

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Summarize important challenges confronting range managers in the twenty first century |  |
| 1.2 | Define rangeland |  |
| 1.3 | List recreational products from rangeland |  |
| 1.4 | Describe desertification and how it develops |  |
| 1.5 | Define grazing |  |

## Benchmark 2: Range Management History

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Recall a brief history of range management |  |
| 2.2 | Describe the Homestead Act |  |
| 2.3 | Describe the Taylor Grazing Act |  |
| 2.4 | Identify potential issues concerning the future of rangelands |  |

## Benchmark 3: Rangeland Physical Conditions

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | List the climatological factors influencing range productivity |  |
| 3.2 | Compare rangeland productivity as it relates to different climatic factors |  |
| 3.3 | Explain the “Orographic effect" |  |
| 3.4 | Estimate forage productivity based on precipitation effectiveness and frequency |  |
| 3.5 | Define drought |  |
| 3.6 | Explain aspect and its influence on range productivity |  |

## Benchmark 4: Description of Rangeland Types

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Prepare a report explaining one range type found in the continental United States. (Range type assigned in class. Topics addressed will be location, topography, climate, forages, productivity and application.) |  |
| 4.2 | Present a range type report to the class from an instructional perspective (Range type assigned in class) |  |

## Benchmark 5: Range Plant Physiology

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | List the four fundamental concepts in range plant management |  |
| 5.2 | Recognize grass plant components, location and function |  |
| 5.3 | Label the parts of a grass plant  |  |
| 5.4 | Group mechanisms of resistance exhibited in plants by plant type |  |
| 5.5 | Differentiate between characteristics of structural and non-structural carbohydrates |  |
| 5.6 | Describe the effects of different grazing pressures |  |
| 5.7 | Indicate the level of plant material that should remain after grazing to prevent a negative plant response |  |

## Benchmark 6: Range Ecology

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 6.1 | Describe range ecosystem components and function |  |
| 6.2 | Explain abiotic and biotic components in a range ecosystem |  |
| 6.3 | Explain plant succession and climax |  |
| 6.4 | Define secondary succession |  |
| 6.5 | Discuss the impact of fire on rangeland vegetation |  |
| 6.6 | Analyze the relationship of grazing and succession in |  |
| 6.7 | Explain retrogression and its cause |  |
| 6.8 | Associate effects of climate with plant succession |  |
| 6.9 | Associate effects of fire with plant succession  |  |
| 6.10 | Analyze the impact of livestock on rangeland vegetation |  |
| 6.11 | Define drought |  |
| 6.12 | Relate drought conditions with potential forage production |  |
| 6.13 | Summarize the effects of competition with regard to range plants |  |

## Benchmark 7: Range Inventory & Monitoring

### Competencies

| **#** | **Description** | **RATING** |
| --- | --- | --- |
| 7.1 | List components of range inventory |  |
| 7.2 | Describe range monitoring  |  |
| 7.3 | Differentiate between a range inventory and range monitoring |  |
| 7.4 | Analyze various pasture/ranges and determine range condition |  |

## Benchmark 8: Stocking Rates

### Competencies

| **#** | **Description** | **RATING** |
| --- | --- | --- |
| 8.1 | Recognize the importance of stocking rates |  |
| 8.2 | Analyze stocking rate studies and develop his/her own stocking rate theory |  |
| 8.3 | Compare the effects of heavy stocking to light-moderate stocking |  |
| 8.4 | Relate range trend to stocking rate |  |
| 8.5 | Recognize the influence of stocking rate on range livestock productivity |  |
| 8.6 | Associate various stocking rates with their appropriate risk |  |
| 8.7 | Explain the advantage and disadvantages of flexible vs. fixed stocking rates |  |
| 8.8 | Construct grazing intensity and timing recommendations based on information provided |  |
| 8.9 | Calculate stocking rate based on the example presented |  |
| 8.10 | Determine adjustments to be made on recommended stocking rates concerning distances from water, slope, and forage demand |  |

## Benchmark 9: Selection of Grazing Methods

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 9.1 | Define deferment, rest and rotation |  |
| 9.2 | Describe considerations in selecting a grazing system |  |
| 9.3 | Summarize continuous grazing |  |
| 9.4 | Compare continuous grazing with deferred-rotation grazing |  |
| 9.5 | Describe the Merrill Three-herd/Four-pasture system |  |
| 9.6 | Explain High-Intensity/Low-Frequency grazing |  |
| 9.7 | Diagram an example of short-duration grazing |  |
| 9.8 | Recognize excessive stocking rate can void the benefits of any grazing system |  |

## Benchmark 10: Methods of Improving Livestock Distribution

### Competencies

| **#** | **Description** | **rating** |
| --- | --- | --- |
| 10.1 | Recognize factors that cause poor distribution of livestock |  |
| 10.2 | Prepare recommended management practices to improve livestock distribution |  |
| 10.3 | Classify kinds of livestock based on their vegetation preferences |  |
| 10.4 | Explain economy of scale in relation to profitability |  |
| 10.5 | Design strategies to maintain and improve economic stability in livestock production |  |
| 10.6 | Design strategies to maintain and improve stability of livestock produced |  |

## Benchmark 11: Range Wildlife Management

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 11.1 | Describe trends in wildlife populations |  |
| 11.2 | Recognizing grazing effects on rangeland wildlife |  |
| 11.3 | Associate operational impacts of livestock grazing to wildlife populations |  |
| 11.4 | Associate management practices with the impact on wildlife |  |

## Benchmark 12: Prepare & Implement a plant management plan

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 12.1 | Evaluate plant responses to varied light color, intensity, and duration  |  |
| 12.2 | Design, implement and evaluate a plan to maintain optimal conditions for plant growth |  |
| 12.3 | Formulate and prepare growing media for specific plants or crops |  |
| 12.4 | Determine the hydraulic conductivity for soil and how the results influence irrigation practices |  |
| 12.5 | Monitor plants for signs of nutrient deficiencies and prepare a scouting report |  |
| 12.6 | Calculate the amount of fertilizer to be applied and calibrate equipment to apply the prescribed amount of fertilizer |  |

## Benchmark 13: Propagate, Culture, & harvest plants

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 13.1 | Design and implement a plan to control the pollination of plants |  |
| 13.2 | Conduct tests associated with seed germination rates, viability and vigor |  |
| 13.3 | Evaluate asexual propagation practices based on productivity and efficiency |  |
| 13.4 | Evaluate the performance of genetically modified crops |  |
| 13.5 | Operate mechanized planting equipment |  |
| 13.6 | Prepare and implement a plant production schedule based on predicted environmental conditions |  |
| 13.7 | Create and implement a plan to control and manage plant growth |  |
| 13.8 | Operate mechanized harvesting equipment |  |
| 13.9 | Implement plans to reduce crop loss |  |
| 13.10 | Monitor environmental conditions in storage facilities for plants and plant products |  |
| 13.11 | Evaluate techniques for grading, handling and packaging plants and plant products |  |

## Benchmark 14: Develop and Implement a Plan for Integrated Pest Management

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 14.1 | Design and implement a crop scouting program |  |
| 14.2 | Predict pest and disease problems based on environmental conditions and life cycles |  |
| 14.3 | Employ pest management strategies to manage pest populations, assess the effectiveness of the plan and adjust the plan as needed |  |
| 14.4 | Evaluate environmental and consumer concerns regarding pest management strategies  |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

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