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

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

Pathways and CIP Codes: **Plant Science and Industry Operations (01.1101).**

Course Description: Course imparts the application and skills needed to bring plant products to market. It may cover a wide variety of topics, including plant production, quality selection and preservation, equipment care and sanitation, government regulations, and marketing and consumer trends. This course may present an overview of product processing or may specialize in specific plant products and challenges related to range and pasture management.

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. |  |

## Benchmark 2: Range Management History

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Recall a brief history of range management. |  |
| 2.2 | Describe the Homestead Act and Taylor Grazing Act. |  |
| 2.3 | 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 and desertification.  |  |
| 3.6 | Explain aspect and its influence on range productivity. |  |

## Benchmark 4: Description of Rangeland Types

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Prepare and present 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.). |  |

## 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 | Describe the effects of different grazing pressures. |  |
| 5.5 | 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. |  |
| 6.5 | Discuss and associate the impact of fire on rangeland vegetation. |  |
| 6.6 | Analyze the relationship of grazing and succession. |  |
| 6.7 | Explain retrogression and its cause. |  |
| 6.8 | Associate effects of climate with plant succession. |  |
| 6.10 | Analyze the impact of livestock on rangeland vegetation. |  |
| 6.12 | Relate drought conditions with potential forage production. |  |
| 6.13 | Summarize the effects of competition regarding 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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