

## **COURSE OUTLINE**

### **Fundamentals of Livestock Nutrition**

#### **Course Description**

AG 211. Fundamentals of Livestock Nutrition. 3 hours credit. This course will enable the student to apply the principles of animal nutrition in livestock feeding. The student will learn about nutritive value of feeds, metabolic processes, and basic ration formulation, as well as the industry's latest technology.

#### **Course Relevance**

The principles in this course will give background knowledge to develop livestock rations according to species' needs and could stimulate student interest in livestock nutrition for consideration as a career.

#### **Required Materials**

Pond, W. G., Church, D. C., and Pond, K. R., (1995). *Basic animal nutrition and feeding*. (4<sup>th</sup> ed.). New York: John Wiley & Sons, Inc.

#### **Learning Outcomes**

The intention is for the student to be able to

1. Analyze feedstuff for nutritional value in ration formulation by species
2. Understand animal nutrient digestion, absorption, and utilization to develop livestock rations according to species needs
3. Apply technological factors affecting feed consumption

#### **Primary Learning PACT Skills that will be DEVELOPED and/or documented in this course**

Through the student's involvement in this course, he/she will develop his/her ability in the following primary PACT skill areas:

1. Critical Thinking
  - Through the analysis of various animal nutrition principles, think through the ration formulating process and make well founded decisions
2. Field-Related Technology
  - Through the demonstration of various animal nutritional activities, the student will be able to formulate a balanced ration

Secondary skills (developed but not documented):

Time Management  
Reading

#### **Major Summative Assessment Task(s)**

These learning outcomes and the primary Learning PACT skills will be demonstrated by

1. Completing a case study of the industry's latest technologies that demonstrates understanding of feedstuff nutrition according to species needs
2. Using National Research Council (NRC) tables, the student will formulate a ration meeting the production requirements of an animal

### **Course Content**

- I. Themes – Key recurring concepts that run throughout this course:
  - A. Metabolic processes by species
  - B. Livestock nutrient requirements by species
  - C. Technology
- II. Issues – Key areas of conflict that must be understood in order to achieve the intended outcome:
  - A. Livestock nutrient resources available to meet needs
- III. Concepts – Key concepts that must be understood to address the issues:
  - A. Technology in livestock feeding
  - B. Species differences
  - C. Nutrient functions
- IV. Skills/Competencies – Actions that are essential to achieve the course outcomes:
  - A. Livestock nutritional requirements
    1. Evaluate common methods of analysis for nutrients and feedstuff
    2. Identify the parts of the gastrointestinal tract of ruminants and non-ruminant species of livestock
    3. Explain how to measure feed nutrient utilization and list requirements by animal species
    4. Outline the digestive processes and explain absorption of nutrients
    5. Explain nutrient metabolism for major nutrients
    6. List forms of feed processing and preparation and explain their value in livestock nutrition
  - B. Livestock nutrient functions
    1. Explain the function of nutrition and its importance in modern livestock production
    2. Describe the common methods of analysis for nutrient content
    3. Identify techniques used to measure feed and nutrient utilization
    4. Explain importance of the six basic nutrients and their functions
  - C. Major nutrients in livestock production
    1. Demonstrate the importance of water as a nutrient
    2. Identify the basic structure and function of carbohydrates
    3. Explain the functions of protein in livestock nutrition
    4. Identify the essential amino acids that make up protein
    5. Define the functions of lipids and explain their place in livestock nutrition
    6. Recognize the macro and micro mineral that are essential in animal nutrition
    7. Relate the importance of calcium and phosphorus ratios
    8. Identify the two major kinds of vitamins and explain their use in rations
    9. Describe vitamin synthesis and/or sources
    10. Define feed additives and explain their place in livestock nutrition

11. Explain factors that affect nutrient intake, requirements, utilization, and nutritional status

D. Feeding standards use

1. Select feeding standards for the various phases of livestock production
2. Determine nutrient needs of different classes of livestock
3. Explain the factors affecting feed consumption
4. Identify common feedstuff used in livestock nutrition
5. Evaluate samples of feed for accurate analysis
6. Perform proper feed sampling techniques
7. Research the nutritive values of common feedstuff from NRC tables for nutrient composition
8. Calculate animal nutrient requirements and apply to formulating a ration

### **Learning Units**

I. Livestock nutritional requirements

II. Livestock nutrient functions

III. Major nutrients in livestock production

IV. Feeding standards use

V. Careers

### **Learning Activities**

Learning activities will be directed towards lecture/demonstrations and practical exercises. Classroom lecture is designed to enable students to understand the key principles in livestock nutrition.

### **Grade Determination**

The student will be graded on assessment tasks and written examinations.