Course Description: Economic and managerial concepts related to farm or agribusiness production process, development of cost data, enterprise analysis, organization and management of production inputs.


Course Objectives
1. Apply economic theory, accounting principles and financial analysis as part of the decision making process.
2. Demonstrate an understanding of the interrelationship among management, marketing, finance, economic principles, accounting principles, operations management, and economic resources.
3. Demonstrate an understanding of the role of information technology and quantitative analysis in decision making.

Detailed Learning Objectives
The following list presents a minimum of 70% of the outcomes students will be able to perform upon completing AGEC 242 (AGEC 342 at DSU):

- Define management as decision making based on economic analysis and distinguish management from marketing and finance.
  - Demonstrate critical thinking skills by describing and applying a fundamental decision making process.
  - Explain the role of goals, business information, and industry trends in the decision making process.

- Demonstrate an understanding that past financial performance of the business can be summarized through the use of a balance sheet and income statement, and that future financial performance can be projected by preparing budgets.
  - Describe the difference between analyzing the past financial performance of a business and projecting its future financial performance.
  - Explain and demonstrate the difference between cash flow, and revenue and cost.

- Demonstrate an understanding of a balance sheet and its components of assets, liabilities and net worth by interpreting information contained on a balance sheet such as owner equity, current assets, intermediate assets, and long-term assets and their respective liabilities. The focus will be on interpreting, rather than creating a balance sheet.
  - Demonstrate an understanding of the use of an income statement to determine profit, including revenue, cost, and net income or profit.
    - Demonstrate an understanding of the concept of depreciation as a business cost by describing the concept and completing a sample calculation.
    - Demonstrate an understanding of the concept of opportunity cost as a consideration in analyzing a business’ level of profit.

- Prepare a cash flow budget and describe its use, such as identifying when loans may be needed and when they can be repaid.
- Recognize and apply the economic concepts of supply and demand as they relate to market price which, in turn, impacts budget preparation.

- Illustrate, describe and apply economic principles relating to production theory, including diminishing marginal productivity, maximum production, fixed cost, variable cost, marginal cost, marginal revenue, and profit maximization.
  - Illustrate or describe the impact of advancing production technology

- Understand the concept of enterprise analysis and its application in determining profitability of alternative outputs or products.
  - Complete an introductory cost analysis for an enterprise; for example determine break-even price and recognize how that information can be used in decision making.
  - Recognize measures of profitability and efficiency

- Understand the concept of partial budget analysis and its application in determining the impact on profitability of making a change
  - Prepare an introductory partial budget analysis

- Briefly summarize whole-firm planning
  - Define strategic planning and explain the integration of financial analysis, enterprise analysis, and cash flow budgeting

- Explain how risk and uncertainty impact the analysis of future projections.

- Understand the implications of factors outside the firm (e.g., consumer preference, globalization, industry consolidation, market structures) on a manager’s decision-making, e.g., determinants of demand and supply.

- Demonstrate the ability to use basic computer skills, such as preparing a document, retrieving information via the internet, and using a spreadsheet as an analytical tool (e.g., preparation of financial statements, budgets, enterprise analysis).

Selected topics not included in the 70% common content and competencies:
- Prepare an introductory income statement
- Demonstrate an understanding of accrual adjustments, ratio analysis, accounts receivable and accounts payable
- Analyze the control of land through leasing or ownership
- Identify various sources of capital and the economics of capital use
- Describe the human resource concerns of agricultural labor
- Demonstrate an understanding of investment analysis and the concept of time value of money by completing a sample calculation
- Consider the role of information in the food industry, such as identity preservation and traceability, documenting production practices, using GPS data, etc
INTRODUCTION TO AGRICULTURAL FINANCE

AGEC 246

Upon completion of this course, students should have a basic understanding and be able to apply the concepts of the following content items to typical agricultural problems and situations:

Financial Statements
Cash Flow Budget
Pro-Forma Statements
Depreciation
Money/Interest Rates
Interest Rates – Loan Repayment
Loan Analysis
Time Value of Money
Capital Budgeting
Investment Analysis
Leasing
Lenders
Policy Issues
Credit Scoring
AGRI 275 - Introduction to Precision Farming

Student outcomes (core competencies)

1. Demonstrate the ability to record the location of an object and locate a predetermined waypoint, using a handheld Global Positioning System.

2. Understand the tools of precision farming and how to integrate them in a practical manner to a farming operation.

3. Demonstrate the ability to answer agriculture questions by gathering data, analyzing data and providing practical application of the data analysis.

4. Demonstrate an understanding of agricultural GPS applications including vehicle guidance and auto steering, variable rate technology, remote sensing, yield monitoring and analysis of soil properties.

5. Be able to utilize GIS software to import and analyze data and generate maps.

6. Demonstrate the ability to manage and manipulate data.

7. Compare and contrast various brands of precision farming equipment.

8/12/2009
ANSC 114
Introduction to Animal Science

Description: General principles of the livestock industry and relationships to humankind.

The following list contains the agreed upon competency areas for ANSC 114. Courses approved by the agriculture articulation committee should minimally include these competency areas.

- Contribution of animals to human needs
- Issues in animal agriculture
- Red meat production
- By-products
- Evaluation
- Reproduction
- Feeds and nutrition
- Digestion
- Animal behavior
- Animal health
- Breeds of livestock
- Management systems
- Alternative livestock enterprises
ANSC 123
Feeds and Feeding

Description: Principles of feeding livestock including digestive systems, nutrient requirements, nutrient characteristics and sources used in the formulation of balanced rations.

The following list contains the agreed upon competencies for ARSC 123. Courses approved by the agriculture articulation committee should minimally include these competencies.

1. Identify the classes of nutrients, their function, and source
2. Classify feedstuffs into general categories
3. Use different ways of measuring a feeds value
4. Balance a ration for energy or protein and check minerals and vitamins
5. Determine an animal’s nutrient requirements, feed values of these nutrients, and balance a ration from available feeds that is productive and economical
6. Identify symptoms that would indicate nutrition based health problems
7. Research and report on a nutrition health problem
8. Apply nutrition principles and concepts to beef, sheep, swine, horses, and poultry.
Course Description: General production and management of major meat animal species. Topics include production systems, feeding, facilities, health, economics, and marketing.

The following list contains the agreed upon competencies for ANSC 220. Courses approved by the agriculture articulation committee should minimally include these competencies.

Upon completion of ANSC 220, students should be competent in the following items as it relates to beef, sheep, swine and dairy:

I. Production Systems
   a. Explain and describe production systems applicable to each species.

II. Genetics & Breeding Systems
   a. Explain and describe breeding systems.
   b. Evaluate production livestock based on genetics and performance records.

III. Herd Health
    a. Develop a preventative heard health program for each species

IV. Nutrition
    a. Understand basic nutrition requirements for each species.

V. Reproduction
    a. Evaluate various reproduction enhancements and common management practices.

VI. Facilities and Waste Management
    a. Understand waste management and environmental issues with various facility managements.

Drafted 8-6-08
ASM 125 Construction and Fabrication Technology

Student outcomes (core competencies)

Upon completion of ASM 125 students will be able to:

A. Basic electrical properties
   1. Understand basic electric circuits
   2. Identify types of common switch types and uses
   3. Use a volt-ohm meter to analyze simple circuits and solve problems
   4. Understand the terminology and wirings of electric motors

B. Metal working methods and differences in metal
   1. Determine the best method of metal working to achieve the desired result
   2. Understand tempering and heat treatment processes and how it affects metal
   3. Understand construction methods and procedures and how they can change the metals

C. Basic construction tools and practices
   1. Create a mechanical drawing
   2. Create a bill of materials from blueprints
   3. Understand construction terminology
   4. Understand building construction

D. Basic types of machines
   1. Understand basic hands and power tool function, care and maintenance
   2. Understand and calculate speed ratios and sizes of drive and driven gears, sprockets and pulleys
H&CE 241 - Leadership and Presentation Techniques

Student outcomes (core competencies)

Upon completing H&CE 241, the student should be able to:

- Define and describe leadership
- Identify various models of leadership
- Explain and utilize Parliamentary Procedure in group meetings
- Describe and demonstrate use of effective presentation skills
- Develop and articulate a working personality profile/philosophy of leadership.
PLSC 110, World Food Crops  
Student Outcomes (core competencies)

Scientific principles of crop growth, worldwide production, management alternatives, and processing for domestic and international consumption.

Upon completion of PLSC 110, students will be able to:

- Explain and Critique Important Aspects of the Leading Food Crops in the World, U.S., and North Dakota, such as:
  - Importance of each as source of carbohydrate, lipid, and protein, and combinations that provide adequate human diets
  - Major areas of production for each
  - Why people grow what they grow, where they grow it
- Describe and evaluate diets in specific regions of the world, with regards to:
  - Providing adequate levels of essential diet components
  - Need for increasing food quantity and quality
  - Methods of increasing food increases
- Summarize the processing of major food crops, including:
  - Predict the human activities required from harvest to grocery store shelves for various food products.
  - Evaluate the impact of processing on the essential diet components of the food products
- Explain the interdisciplinary contributions to management of food crops globally
  - Summarize the general methods of pest management and create integrated management systems for growers in diverse global locations
  - Discuss and critique the importance of healthy soils to our food system
  - Justify widely used crop management methods relative to food safety
- Explain how crops grow and develop, including:
  - Summarize vegetative characteristics and meristematic regions
  - Discuss seed structure relative to source of food products as well as germination
  - Differentiate the types of emergence used by world food crops
  - Order growth stages for key world food crops
  - Discuss flowering and seed formation for families of world food crops
  - Solve common and relevant problems experienced by growers
- Identify plants/seeds of important world food crops
PLSC 223
Introduction to Weed Science

**Course Description:** Introduction of a basic knowledge of weeds, herbicide groups, the use of pesticides, economic and environmental considerations, personal safety, modes of action and terminology.

The following list contains the agreed upon competencies for PLSC 223. Courses approved by the agriculture articulation committee should minimally include these competencies.

Upon successful completion of this course students should be able to:
1. Explain major herbicide modes of action.
2. Identify herbicide groups and families within each mode of action.
3. Identify weed plants by seed, vegetative, and reproductive stages.
4. Explain regulatory aspects of weed control.
5. Explain factors associated with application and dissipation of pesticides in the environment.
6. Describe weed management options.
7. Demonstrate an understanding of safe and accurate application of pesticides.
8. Explain the concepts and issues associated with herbicide resistance.
9. Analyze and understand pesticide calibration formulas and equipment.

8/6/2008
PLSC 225 – Principles of Crop Production

Student outcomes (core competencies)

Students completing PLSC 225 should be competent in the following areas:

Classify crops into principal, alternative, new, and experimental categories in North Dakota, the northern Great Plains, the United States, and other countries

Identify, understand, and integrate the key agronomic production practices (cultivar, seeding date, seeding rate, seeding depth, and fertility, pest (IPM), and harvest management, and etc.) necessary for successful crop production and relate these to crop classification

Identify, understand, and integrate the key factors (climate, soils, transportation, processing, markets, and etc.) affecting crop distribution and performance in North Dakota, the northern Great Plains, the United States, and other countries

Describe the key agronomic production practices, life cycles (growth staging), and water requirements for cereal grains, corn, soybean, canola, dry bean, and sunflower and be capable of applying these to other similar crops

Understand factors important in stand establishment (crop emergence type, seed germination and vigor, seeding depth, soil moisture, seeding date, etc.) and how crops compensate for low stands (yield components) and when should a stand be abandoned and replanted (what is the decision process)

Discuss crop growth and development and gain a basic understanding of growth factors (genetic potential, nutrients, light, water, temperature, and growing season duration) associated with crop performance, and identify critical crop developmental stages for limitations in growth factors

Compare and contrast value-added production systems (examples in North Dakota and region) and how they enhance sustainability

Understand the components of precision farming (site-specific, variable-rate, field mapping, etc.) and how these relate to sustainable agriculture (past, present, and future)

Describe and understand the importance and components of sustainable agriculture and how these relate in commonness and uniqueness to individual farms in North Dakota and other regions of the United States
RNG 236/336
Introduction to Range Science

Description: Principles of range management, range evaluation, and range improvement.

The following list contains the agreed upon competency areas for RNG 236/336. Courses approved by the agriculture articulation committee should minimally include these competency areas.

Rangeland and humans, an introduction
History of range management
Rangeland characteristics
Range plant identification
Plant physiology and morphology
Range ecology
Range inventory and analysis
Grazing management and systems
Range animal nutrition
Livestock production
Range wildlife management
Multiple use
Range hydrology
Range improvement and development
Land reclamation
International rangeland management
SOIL 210
Introduction to Soils

Description: Physical, chemical and biological properties of soils related to use, conservation and plant growth.

The following list contains the agreed upon competency areas for SOIL 210. Courses approved by the agriculture articulation committee should minimally include these competency areas.

Functions of soil
Components of soil
Parent materials
Soil forming factors
Physical properties
Chemical properties
Soil nutrients
Soil density
Soil water
Soil biology
Soil taxonomy
Land use and soil surveys
Soil conservation
Soil as a medium for plant growth
SOIL 222/322, Soil Fertility and Fertilizers
Student Outcomes (core competencies)

Upon completion of SOIL 222, students will be able to:

- Explain Plant-Soil Interactions
  - Organic Matter
- Understand importance of nitrogen in the agricultural system
  - Describe nitrogen in the plant itself
  - Describe nitrogen movement in soil
  - Describe nitrogen interactions in soil
  - Identify nitrogen sources
- Understand importance of phosphorus in the agricultural system
  - Describe phosphorus in the plant itself
  - Describe phosphorus movement in soil
  - Describe phosphorus interactions in soil
  - Identify phosphorus sources
- Understand importance of potassium in the agricultural system
  - Describe potassium in the plant itself
  - Describe potassium movement in soil
  - Describe potassium interactions in soil
  - Identify potassium sources
- Understand importance of other essential nutrients in the agricultural system
- Understand the importance of acidity and alkalinity
  - Describe the properties of acidity
  - Describe the properties of alkalinity
  - Describe the management issues associated with acidity
  - Describe the management issues associated with alkalinity
- Understand Soil Fertility Evaluation
  - Formulate basic fertility management recommendations
  - Evaluate and adjust fertilizer recommendations
  - Understand methods of fertilizer application
Agriculture Common Course Matrix (Unique)

Unique Courses to Bismarck State College: Taught by Craig Kleven

**ASM 175:**
Course Description:
The purpose of this course is to provide students the basic fundamentals and applications of agriculture industry skills in electricity, plumbing, selecting and using hardware, measurement, and structures.

Course Objectives:
1. Students successfully completing this course will demonstrate a basic understanding of the following:
2. Understand electricity as it is used for light, heat and power in various farm and ranch applications.
3. Correctly demonstrate the principles and procedures of electrical wiring for new installations, planning, maintenance, and improvement of existing installations.
4. Assemble various plumbing joints and valves, for plastic and copper pipe fittings.
5. Identify, select, and use the proper fasteners/hardware for various agriculture applications.
6. Properly acquire and recognize measurements of various agriculture applications.
7. Identify and be aware of diverse types of agriculture structures and components.

Currently not available on the Unique Course Matrix

**ASM 130: Agriculture Industry Machinery Operation (2 credits)**
Course Description:
Operation of skid and oscillating loaders, fork lifts, tractors, trucks, trailers, agriculture application equipment and other agri-business equipment. Students prepare for a commercial driver's license. Defensive driving taught. Equipment lease service fee.

Course Objectives:
1. Operate equipment safely.
2. Perform pre-trip inspection on equipment.
3. Perform basic maintenance as needed (air, oil, grease).
4. Operate skid steer loader.
5. Operate fork lift.
6. Understand various operations of applicator equipment.
7. Prepare for Commercial Driver’s License.

**PLSC 243 Advanced Weed Science (2 credits):**
Course Description:
Interpretation and understanding of Herbicide Mode of Action, Herbicide Resistance, Herbicide Efficacy, Herbicide Toxicology, Herbicide Selectivity, and Characteristics of Weeds. Prerequisite of PLSC 223/223L is required.

Course Objectives:
1. To develop a functional understanding of major herbicide modes of action, herbicide groups within each mode of action, and weed control characteristics of major herbicides
within each group, including the visible symptoms of injury to plants caused by these herbicides.

2. To understand factors that affect the efficacy of both soil- and foliar-applied herbicides.
3. To understand the factors that affect dissipation of herbicides and other pesticides in the environment.
4. To understand integrated weed management options, including biological, cultural, and physical weed control systems that can be used either alone or to complement herbicide-based programs.
5. To develop skills to safely and accurately apply pesticides, including an understanding of equipment and calibration techniques.
6. To improve identification of weed plants and seeds, including learning family and life cycle designations.