I. TITLE:

Agricultural Buildings and Construction

II. CATALOG DESCRIPTION:

An introduction to technical design, selection of materials, and modern construction techniques used in the agriculture industry. Emphasis on concrete and erection of pole framed and steel buildings. (Spring) Prerequisite: AGR 170 or instructor’s approval.

III. PURPOSE:

To help students in all agricultural options understand basic agricultural buildings and construction used in the industry. Emphasis is placed on building design as determined by culture and practice, as well as, through today’s practical engineering design principles based upon economics.

IV. COURSE OBJECTIVES:

A. Learn safety procedures in agriculture building and construction design and erection.
B. Understand the terminology used in agricultural construction.
C. Understand the many variations of agricultural buildings based on function, such as: housing animals, plants, machinery, etc.
D. Understanding the selection of materials based on live and dead loads, cost, life expectancy, etc.
E. Gain skills necessary to evaluate, design and construct a variety of structures in the field of agriculture.

V. CONTENT OUTLINE:

A. Safety in Construction
   1. Agriculture building and construction integrity
   2. Equipment identification
   3. Equipment usage (hand and power tool safety, construction and erection machinery, etc.)
   4. PPE – Personal Protective Equipment
B. Types of Buildings and Structures
   1. Machinery storage
   2. Shops
   3. Swine
   4. Beef
   5. Dairy
   6. Poultry
   7. Horses
   8. Hay
   9. Grain and other crops

C. Initial Planning
   1. Computing loads
   2. Selecting a design plan
   3. Interpreting blueprints, zones, and codes
   4. Locating and laying-out the building sites

D. Building Construction
   1. Foundations
      a. Site preparation
      b. Utilities
      c. Foundations
   2. Wall Construction
      a. Stud wall
      b. Pole wall
      c. Rigid wall
   3. Designing joist, beams, and columns
   4. Roofing and sheet metal
      a. Use of framing square
      b. Layout of rafters, braces, and trusses
      c. Purlins, solid decking, and shingles
   5. Fasteners
   6. Computing (R) values-insulation
   7. Ventilation of buildings (use of psychrometrics)

E. Material Selection and Use
   1. Concrete
      a. Properties of concrete
      b. Selection of concrete materials
      c. Mixing, placement, finishing, and curing concrete
      d. Preparation of site for construction and construction form
      e. Construction of walls with masonry units
   2. Woods
      a. Plywood
      b. Softwoods
      c. Hardwoods
   3. Plumbing
      a. Plumbing safety
      b. Plumbing tools
c. Designing plumbing systems
d. Plumbing codes
e. Hydraulics and Pneumatics
f. Lab exercise
   i. Sweating a joint (CU)
   ii. Construction of PVC and CPVC pipe
   iii. Pipe threading – work with iron pipe
   iv. Galvanized pipe
4. Electrical
   a. Designing and installing service entrance
   b. Designing and installing circuits
   c. Meeting local, state, and national electrical code standards

VI. INSTRUCTIONAL ACTIVITIES:

   A. Field Trips
   B. Labs
   C. Demonstration
   D. Problem Solving

VII. FIELD AND CLINICAL EXPERIENCES:

   Classes will consist of agricultural construction labs in the areas mentioned above. Field experiences will include trips to area agricultural industries/farming operations that have pertinent construction in progress.

VIII. RESOURCES:

   A. Books on Reserve
   B. Handouts
   C. Structure models
   D. Labs
   E. Field trips/Guest speakers
   F. Extension Service Designs

IX. GRADING PROCEDURES:

   90 - 100 = A
   80 - 89 = B
   70 - 79 = C
   60 - 69 = D
   Below 60 = E

   All tests will be based upon 100 points. Any tool I.D. sheet, equipment demonstration, project, or other lab type exercise will be graded as lab work. Homework problems and tests will be graded as classroom work. Fifty-percent
of the grades will be based on classroom and 50% on lab work. The final exam will be comprehensive. Safety glasses must be purchased by the student and are required. Failure to wear the glasses will result in dismissal from the lab and a zero for the class meeting. Missed exams and late assignments may be made up provided there is a reasonable excuse.

IX. **ATTENDANCE POLICY:**

Please refer to the most current copy of the *Murray State University’s Undergraduate Bulletin and Graduate Bulletin.*

X. **ACADEMIC HONESTY POLICY:**

(Adopted by the MSU Board of Regents)

Cheating, plagiarism (submitting another person’s material as one’s own), or doing work for another person which will receive academic credit are all impermissible. This includes the use of unauthorized books, notebooks, or other sources in order to secure or give help during an examination, the unauthorized copying of examinations, assignments, reports, term papers, or the presentation on unacknowledged material as if it were the student’s own work. Disciplinary action may be taken beyond the academic discipline administered by the faculty member who teaches the course in which the cheating took place.

NOTE: The School of Agriculture Faculty have adopted and implemented an Academic Honesty Policy in addition to the University Honesty Policy, which can be found in the current *Undergraduate Bulletin and Graduate Bulletin.* The policy sets guidelines regarding acts of dishonesty and the procedure to follow should an event occur. It is each Agriculture student’s responsibility to obtain and read a copy of this document. The School’s Academic Honesty Policy can be obtained by asking for a copy from any Agriculture Faculty member or the Secretary.

XI. **TEXT AND REFERENCES:**

A. Required Texts:
   - *Concrete and Concrete Masonry*
   - *Practical Farm Buildings*
B. Reference in Howton Agriculture Building
   1. The Farm Shop
   2. Mechanics in Agriculture

XII. **PREREQUISITES:**

AGR 170 or instructors approval
XIII. **STATEMENT OF AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY:**

Murray State University endorses the intent of all federal and state laws created to prohibit discrimination. Murray State University does not discriminate on the basis of race, color, national origin, gender, sexual orientation, religion, age, veteran status, or disability in employment, admissions, or the provision of services and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities equal access to participate in all programs and activities. For more information, contact Sabrina Y. Dial, Director of Equal Opportunity, Murray State University, 103 Wells Hall, Murray, KY 42071-3318. Telephone: 270-809-3155 (voice), 270-809-3361 (TDD).

XV. **MSU SCHOOL OF AGRICULTURE CELL PHONE POLICY**

The School of Agriculture recognizes that in today’s world cell phones are a familiar and often necessary form of communication for students.

It shall be the policy of the School that no cell phone usage shall be allowed in class and/or labs without the prior consent of the course instructor. This shall include verbal calling, incoming calls, email, text messaging, and use of cell phone calculators on tests and quizzes.

Cell phones must be kept off and out of sight (i.e. secured to a person’s belt or kept in a bag or purse away from desks and lab counters).

Should a student’s cell phone be visible, ring, or other form of unauthorized usage that is interruptive to the class or lab, the student may be asked to leave class and not return for that class/lab period.

Upon prior consent of the instructor, a student may obtain permission to have their phone on in case of an emergency or in critical family situations.

This policy also includes pagers and other electronic equipment such as blackberries and/or computers/laptops.