I. **TITLE:**

Agricultural Systems Technology Laboratory Management

II. **BULLETIN DESCRIPTION:**

This course is a study of theories involving agricultural mechanization and systems technology. Emphasis is placed on understanding the technology involved in operating, maintaining and managing power and machinery, electricity, precision agriculture, soil and water engineering, metallurgy and fabrication, and safety systems. Skill development emphasized. (Fall only)

Prerequisite: AGR 170

III. **PURPOSE:**

To provide students with an in-depth understanding of the fields of Agricultural Engineering and Agricultural Systems Technology.

IV. **COURSE OBJECTIVES:**

A. To develop safety practices and training in handling, transporting, storing, and using agricultural mechanization equipment.
B. To develop a comprehensive understanding of planning and organizing agricultural mechanization laboratories.
C. To develop a basic understanding of agricultural mechanization equipment handling, operation, and management.
D. To become familiar with the fundamentals and applications of electricity.
E. To develop fundamental skills used in arc, MIG and oxy-acetylene welding, brazing, soldering and plasma arc and oxy-acetylene cutting.
F. To become familiar with precision farming application tools.
G. To develop fundamental skills operating hand tools and power tools utilized in the agricultural mechanization laboratory.
V. **CONTENT OUTLINE:**
A. To develop basic knowledge of:
   1. Principles of engines and machinery
      Engine types
      Basic engine operation
   2. Surveying and GPS equipment
      Principles of surveying
      Precision agriculture product analysis and use
   3. Procedures in agricultural construction
      Hand tool operation, maintenance, and application
      Power tool operation, maintenance and application
   4. Electrical wiring and electrical theory
      Electrical education applications
      Electrical fundamentals
   5. Fundamentals of welding
      Arc welding
      Oxy-acetylene welding
      Mig welding
      Oxy-acetylene cutting
      Plasma arc cutting
   6. Management of the agricultural mechanization laboratory
      Inventory management
      Equipment maintenance
      Facility management
      Safety

VI. **INSTRUCTIONAL ACTIVITIES:**
A. Demonstrations
B. Study Questions
C. Lecture
D. Labs
E. Audio-video presentations
F. Computer programs

VII. **FIELD AND CLINICAL EXPERIENCES:**
A. To develop basic knowledge of:
   1. Principles of engines and machinery
      Engine types
      Basic engine operation
   2. Surveying and GPS equipment
      Principles of surveying
      Precision agriculture product analysis and use
3. Procedures in agricultural construction
   Hand tool operation, maintenance, and application
   Power tool operation, maintenance and application
4. Electrical wiring and electrical theory
   Electrical education applications
   Electrical fundamentals
5. Fundamentals of welding
   Arc welding
   Oxy-acetylene welding
   Mig welding
   Oxy-acetylene cutting
   Plasma arc cutting
6. Management of the agricultural mechanization laboratory
   Inventory management
   Equipment maintenance
   Facility management
   Safety

VIII. **RESOURCES:**

A. Millermatic 251
B. Millermatic 200
C. Lincoln AC-DC arc welders
D. Portable gas powered Lincoln generator welder
E. Portable oxy-acet cutting system
F. Plasma Arc Cutter
G. Metal, cutting goggles, and other accessories provided
H. Briggs and Stratton Small Engines
I. Hako models
J. Cutaways
K. Lab buzzboards and test panels
L. Electrical panels, circuit boards, etc
M. GPS receivers
N. Textbooks on reserve
O. Handouts

IX. **GRADING PROCEDURES:**

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

A. There will be three one-hour exams worth 200 points each. The final exam will be comprehensive.
B. Missed exams and late assignments may only be made up provided there is a reasonable excuse. A failing grade in the lab will result in a failing grade for the course.
C. All lab exercises must be completed in the Howton Agriculture Building. No exceptions.
D. All projects must conform to the Lab Instruction Guide.

X. ATTENDANCE POLICY:

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

XI. 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.

XII. TEXT AND REFERENCES:

REQUIRED:

RECOMMENDED:
OTHER REQUIRED MATERIALS:
Non-flammable pants
Non-flammable shirt
Welding gloves
Leather high top shoes

Cutting goggles and safety glasses will be provided; students have the option to purchase their own.

XIII. PREREQUISITES:
AGR 170: Introduction to Agricultural Systems Technology

XIV. 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.

XV. **CLASSROOM AND LABORATORY POLICY**
The following policies are set for a functional and conducive learning environment.

1. Be on time to lecture and laboratory meetings.
2. Report any broken or defective equipment to the instructor immediately.
3. Be courteous to your fellow students by returning all tools (in clean condition) to their proper place after use.
4. Adhere to the Lab Clean Up Check-off sheet at the end of each Lab. Be sure to clean your work area as well as a team to clean the facility each and every lab period. Failure to clean your work area will result in a 30% grade reduction for the daily laboratory activity.

XVI. **SAFETY**

Students must adhere to all safety procedures and policies at all times. Safety glasses must be worn at all times while in the shop, including under your helmet while welding. Students are also required to wear long sleeve shirts (or coveralls), pants, high top leather shoes and welding gloves while in the laboratory.

Failure to comply with safety procedures will result in the loss of a laboratory grade for minor infractions and removal from the course for major infractions. This policy is in effect for your safety as well as your fellow students and instructor.