I. **TITLE:**

Agriculture Metal Process

II. **CATALOG DESCRIPTION:**

This course is a study of basic theories involving metallurgy and the metal working process. Includes SMAW, GMAW, brazing, OA welding & cutting and plasma arc. Skill development emphasized. (Fall & Spring)

III. **PURPOSE:**

To provide students with a basic understanding of metallurgy. To safely provide students with the skills necessary to do metal fabrication found in the field of agriculture.

IV. **COURSE OBJECTIVES:**

A. To develop safety practices and training in handling, transporting, storing, and using welding and cutting equipment.
B. To develop a basic understanding of metallurgy by addressing the physical, mechanical, and chemical properties of metals.
C. To become familiar with basic technology used in the industry.
D. To become familiar with the types and systems using electricity and/or gases to shape, cut, and weld metals.
E. To develop fundamental skills used in arc, MIG and oxy-acetylene welding, brazing, soldering and plasma arc and oxy-acetylene cutting.

V. **CONTENT OUTLINE:**

A. Arc welding
   1. Safety Rules
   2. Theory
   3. Study Questions
   4. Lab Welds- Include: flat pad, vertical up pad, vertical down pad, horizontal pad & overhead optional.
B. Oxy-Acetylene Welding
   1. Safety Rules
   2. Theory
3. Study Questions
4. Lab Welds- Include: puddling, flat bead, butt fillet, overlap, corner, & edge.

C. Mig Welding
   1. Safety Rules
   2. Theory
   3. Study Questions
   4. Lab Welds- Include: flat bead, vertical up bead, vertical down bead, & horizontal bead.

D. Oxy-Acetylene Cutting
   1. Safety Rules
   2. Theory
   3. Study Questions
   4. Lab Welds- Include: straight, bevel, holes

E. Plasma Arc Cutting
   1. Safety Rules
   2. Theory
   3. Study Questions
   4. Lab Cuts- To be announced

F. Soldering
   1. Safety Rules
   2. Theory
   3. Study Questions
   4. Lab exercise

G. Brazing
   1. Safety Rules
   2. Theory
   3. Study Questions
   4. Lab Exercise

VI. INSTRUCTIONAL ACTIVITIES:

   A. Demonstrations
   B. Study Questions
   C. Lecture
   D. Labs
   E. Audio-video presentations
   F. Computer programs

VII. FIELD AND CLINICAL EXPERIENCES:

   Lab experiences mentioned above in V.
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. Manifold oxy-acet welding system  
G. Plasma Arc Cutter  
H. Metal, cutting goggles, and other accessories provided  
I. Textbooks on reserve  
J. Handouts

IX. **GRADING PROCEDURES:**

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

A. There will be four one-hour exams worth 100 pts. Each announced at least one week in advance. The final exam will be comprehensive.  
B. The final grade will come from a lecture grade (50%) derived from home work, hour exams and the final exam, plus a laboratory grade (50%) based on safety, work habits, skills developed in the lab and project welds completed. All lab assignments must be completed or a grade of “I” will be assigned.  
C. 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.  
D. All metal fabrication and lab exercise must be completed in the Howton Agriculture Building. No exceptions.  
E. All welds must conform to the Lab Instruction Guide or points will be deducted.

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:
Welding Skills, 3rd Edition by R.T. Miller
Welding Skills Workbook, 3rd ed., by Jonathan F. Gosse

XIII. PREREQUISITES:
None

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.