I. **TITLE:**

   Advanced Agricultural Electrification Systems

II. **CATALOG DESCRIPTION:**

   Troubleshooting and repair of electric motors and controls and their utilization in handling and processing of agricultural products. Lecture, one hour; laboratory, four hours. (Fall, odd years) Prerequisites: AGR 170 and AGR 577 or professor’s permission.

   *To receive graduate credit for this course, a student must be admitted to graduate studies prior to registering for the course.*

III. **PURPOSE:**

   To provide students with an understanding of electrical DC agricultural equipment circuits, lighting and accessory circuits, monitors and controllers, AC motors and generators, and refrigeration electrical systems used in the agricultural industry.

IV. **COURSE OBJECTIVES:**

   A. To become familiar with electrical theories, terms, and safety procedures relative to the agricultural industry.
   B. To become familiar with electrical testing equipment and tools.
   C. To provide the experience necessary to develop skills to wire and troubleshoot agricultural equipment, AC motors and refrigeration equipment.

V. **CONTENT OUTLINE:**

   A. Standby Electrical Power Systems
   B. Phase Converters
   C. Transformers
   D. Heating and Cooling
   E. Electric Motors
   F. Motor Controls
   G. Cord-and-Plug-Connected Equipment
H. Reading Wiring Diagrams and Blueprints
I. Grain Drying and Storage Wiring
J. Irrigation System Wiring
K. Agricultural Farm Equipment (tractors, combines, GPS systems, planters, etc.)
   1. Storage Batteries
   2. Charging Circuits
   3. Starting Circuits
   4. Ignition Circuits
   5. Electronic Ignition Systems
   6. Lighting and Accessory Circuits
   7. Connectors
   8. Monitors and Controllers
   9. Maintenance
   10. Diagnostic Testing

VI. INSTRUCTIONAL ACTIVITIES:

A. Demonstrations
B. Schematics and Electrical Blueprints
C. Audio-visual Presentations
D. Resource People
E. Field Trips

VII. FIELD AND CLINICAL EXPERIENCES:

Students will have one major agricultural farm equipment project to wire, troubleshoot, or assemble.

VIII. RESOURCES:

A. Electrical panels, circuit boards, etc.
B. Textbooks on reserve
C. Resource personnel
D. Field involvement
E. Local farm equipment dealerships

IX. GRADING PROCEDURES:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 - 100</td>
<td>A</td>
</tr>
<tr>
<td>80 - 89</td>
<td>B</td>
</tr>
<tr>
<td>70 - 79</td>
<td>C</td>
</tr>
<tr>
<td>60 - 69</td>
<td>D</td>
</tr>
<tr>
<td>Below 60</td>
<td>E</td>
</tr>
</tbody>
</table>
There will be 3 one-hour exams worth 100 points each. Each exam will be announced at least one week in advance. The final exam will be comprehensive. Labs will count for 50%. All tools, meters, etc., will be provided by MSU. Students must furnish safety glasses for lab work.

X. ATTENDANCE POLICY:

Please refer to the most current copy of the Murray State University’s 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 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:

A. Texts
   1. Electrical Systems-Fundamentals of Service by John Deere

XIII. PREREQUISITES:

AGR 170, AGR 577 or Instructor’s Permission

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 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 familiar and often necessary forms 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 his/her 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.