A. **TITLE:** Powersports Electrical Systems

B. **COURSE NUMBER:** MSPT 112

C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)
   
   # Credit Hours: 3
   # Lecture Hours: 3 per week
   # Lab Hours: per week
   Other: per week
   
   Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** Yes ☐ No ☒

E. **GER CATEGORY:** None: ☒ Yes: GER !
   *If course satisfies more than one:* GER !

F. **SEMESTER(S) OFFERED:** Fall ☒ Spring ☐ Fall & Spring ☐

G. **COURSE DESCRIPTION:**

   This course is a study of fundamental electrical circuits and relative theory as applied to powersports machines. Series, parallel, series-parallel circuits, magnetism, direct and alternating current fundamentals; batteries, charging systems, starters, lighting systems, and basic electronics are studied.

H. **PRE-REQUISITES:** None ☒ Yes ☐ If yes, list below:

   **CO-REQUISITES:** None ☐ Yes ☒ If yes, list below:

   MSPT 122 Powersports Electrical Lab, or with permission of instructor
I. **STUDENT LEARNING OUTCOMES:** (see key below)

By the end of this course, the student will be able to:

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<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
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<td>Construct series, parallel, and series-parallel circuits demonstrating fundamentals of electricity</td>
<td>MSPT SO 2</td>
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<td>Calculate circuit elements of voltage, resistance, and current using Ohm’s Law</td>
<td>MSPT SO 2</td>
<td>ISLO ISLO ISLO</td>
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<tr>
<td>Write and recite battery, starting, and charging systems theory of operation</td>
<td>MSPT SO 1</td>
<td>ISLO ISLO ISLO</td>
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<td>Evaluate wiring diagrams to produce a simplified version to show understanding of the above</td>
<td>MSPT SO 1 MSPT SO 4</td>
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</table>
| 1 | Communication Skills  
Oral [O], Written [W] |
| 2 | Critical Thinking  
Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS] |
| 3 | Foundational Skills  
Information Management [IM], Quantitative Lit./Reasoning [QTR] |
| 4 | Social Responsibility  
Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T] |
| 5 | Industry, Professional, Discipline Specific Knowledge and Skills |

*Include program objectives if applicable. Please consult with Program Coordinator!
J. **APPLIED LEARNING COMPONENT:** Yes ☐ No ☒

If YES, select one or more of the following categories:

- Classroom/Lab
- Internship
- Clinical Placement
- Practicum
- Service Learning
- Community Service
- Civic Engagement
- Creative Works/Senior Project
- Research
- Entrepreneurship
  (program, class, project)

K. **TEXTS:**

Automotive Electrical and Engine Performance by James D. Halderman, Pearson Education Inc.

L. **REFERENCES:**

Manufacturer service manuals

M. **EQUIPMENT:** None ☐ Needed: Classroom with technology

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

Exams, quizzes, homework

P. **DETAILED COURSE OUTLINE:**

1. Introduction
   a. Tools
   b. Safety
2. Basics of Circuit Construction
   a. Basics of Electricity
   b. Electrical Terms
   c. Conductors and Insulators
   d. Circuit Protection
3. Meter Usage
   a. Picking the Correct Meter
   b. Use Selections
   c. Proper Techniques
4. Ohm’s Law
   a. Series Circuits
   b. Parallel Circuits
   c. Series-Parallel Circuits
5. Batteries
   a. Construction (lead acid, AGM)
   b. Ratings (Cold cranking amps, marine cranking amps, amp hours)
c. Testing
d. Set-up and maintenance

6. Starting Systems
   a. Types (mechanical vs electrical)
   c. Operation/Magnetism
   d. Control Circuits
   e. Testing
   f. Engagement

7. Charging Systems
   a. Types (permanent magnet vs electromagnet)
   b. Operation/Generation
   c. Testing (includes stator and rectifier regulator testing)

8. Wiring diagrams

9. Lighting Systems Introduction (used often to introduce wiring diagrams, Ohm’s law, and meter usage)

Q. **LABORATORY OUTLINE:** None ☒ Yes ☐