MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE
COURSE OUTLINE

Faculty are required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Collegewide Curriculum Committee.

DEPT. Robotics                        COURSE NO. ROBT 1105

NUMBER OF CREDITS: 3

COURSE TITLE: Electric Circuit Fundamentals

CATALOG DESCRIPTION Basic Electricity I is a foundation course for all students enrolled in the Robotics program. It provides students with an understanding and application of basic electricity and resistive circuits. DC voltage sources, electrical law, and theorems involving resistive type circuits will be covered in lecture and applied in the associated laboratory course. (Concurrent with ROBT 1111)

AUDIENCE

FULFILLS MN TRANSFER CURRICULUM AREA(S) (Leave blank if not applicable)

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE:

LENGTH OF COURSE: (3 C/ 3 lect/pres, 0 lab, 0 other)

THIS COURSE IS USUALLY OFFERED:
Every other year ☐ fall X spring ☐ summer ☐ undetermined ☐

Four goals are emphasized in course at Minnesota West Community & Technical College:

1) ACADEMIC CONTENT: The student will receive the knowledge to understand basic DC and AC circuits.

2) THINKING SKILLS: The student will systematically solve electrical problems

3) COMMUNICATIONS SKILLS: The student will begin to demonstrate appropriate communications both oral and written.

4) HUMAN DIVERSITY: The student will gain self awareness regarding their feelings towards people of different cultures, value systems and socioeconomic status.

TOPICS TO BE COVERED:
   1. define magnetism laws
   2. explain time
3. define sine wave parameter
4. describe rc circuits phase relationships
5. explain induced current/voltage
6. describe ac voltage generator
7. describe phasor diagram
8. define self-inductance
9. compute inductor values
10. define mutual inductance
11. compute circuit total inductance
12. describe rc time constants
13. describe rl time constants
14. compute i/v in ac resistive circuits
15. compute total circuit capacitance
16. solve rc parallel ac circuit problems
17. solve rc series ac circuit problems
18. describe sine wave
19. describe capacitor application
20. compute i/v in ac inductive circuits
21. identify capacitors
22. compute capacitor values
23. describe phase relationships in rl circuit
24. solve rl parallel ac circuit problems
25. solve rl series ac circuit problems
26. define impedance
27. define inductive resistance
28. define capacitor reactance
29. define electricity
30. define current
31. define voltage
32. define resistance
*33. apply Ohm's Law
34. apply electrical law
35. describe voltage/ground reference
36. interpret resistor designations
37. apply Ohm's Law to series circuits
38. apply Kirchhoff's Voltage Law
39. apply voltage divider circuits
40. relate IVR/parallel circuit
41. apply Ohm's Law to parallel circuit
42. apply Kirchhoff's Current Law
*43. apply current divider circuits
*44. apply Ohm's Law to compound circuit
*45. define power/energy
46. describe resister power rating
47. define constant I/E sources
*48. define analog VOM functions
LIST OF EXPECTED COURSE OUTCOMES: The student will understand the basic theory of DC and AC circuits, and how the components interact with each other.

LEARNING/TEACHING TECHNIQUES used in the course are:

- [ ] Collaborative Learning
- [ ] Student Presentations
- [ ] Creative Projects
- [X] Lecture
- [X] Demonstrations
- [ ] Lab

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

- [X] Reading
- [ ] Oral Presentations
- [X] Textbook Problems
- [ ] Group Problems
- [ ] Other (describe below)
- [X] Tests
- [X] Worksheets
- [ ] Papers
- [ ] Term Paper
- [ ] Collaborative Projects
- [ ] Portfolio
- [ ] Individual Projects
- [ ] Other (describe below)

EXPECTED STUDENT LEARNING OUTCOMES:

To receive accommodations for a documented disability, please contact the campus Student Services Advisor as soon as possible. Students are also encouraged to notify the instructor.

This document can be made available in alternative format by contacting Student Services, the Campus CEOs or calling Minnesota Relay Service at 1-800-627-3529. Reasonable accommodations will be provided upon request for documented disabilities. An Affirmative Action Equal Opportunity Educator/Employer. ADA Accessible.

*The information in this course outline is subject to revision.*