

# Dakota County Technical College

## MATS 1205: Math for Electricians

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites:

This course requires either of these prerequisite categories

1. MATS 0100 - Mathematics Skills Lab

Or

2. A score of 56 on test Accuplacer Arithmetic

Corequisites: None

MnTC Goals: None

A course for students enrolling in the Electrical Construction program. After a brief review of fractions, decimals, percents, and proportions, students will apply significant figures and engineering notation in applying Ohm's law, basic formulas of series and parallel circuits, the theorem of superposition, and Norton's and Thevenin's theorems. Students will further solve simultaneous equations and apply Kirchhoff's laws to series, parallel, and complex circuits. Trigonometry, vectors, and AC wave analysis are also introduced. **NOTE TO ELECTRICAL CONSTRUCTION STUDENTS:** This course does NOT fulfill the union requirement of a year of high school algebra. Students looking to fulfill this requirement should enroll in MATS0305.

**B. COURSE EFFECTIVE DATES:** 08/01/2002 - Present

**C. OUTLINE OF MAJOR CONTENT AREAS**

#### **D. LEARNING OUTCOMES (General)**

1. review fraction operations
2. convert among fractions, decimals, and percents
3. use the concept of significant figures to report computational results with reasonable accuracy
4. review proportions and proportion word problems
5. use proportions to convert units
6. solve inverse proportions and word problems
7. solve mixed word problems involving direct and inverse proportions
8. solve percent efficiency problems
9. solve percent increase and percent decrease problems
10. perform arithmetic with integers
11. operate with integer exponents
12. use scientific notation for computations involving very large or very small numbers
13. memorize metric prefixes from Tera through pico
14. express quantities in engineering notation
15. use engineering notation for computations involving very large or very small numbers
16. apply Ohm's law using very large and very small quantities
17. translate between verbal and algebraic expressions
18. solve linear equations
19. solve simultaneous equations by substitution and elimination
20. apply Kirchhoff's laws to series and parallel circuits
21. apply Kirchhoff's laws to complex circuits
22. apply the superposition theorem to analyzing complex circuits
23. apply Thevenin's theorem to analyzing complex circuits
24. apply Norton's theorem to analyzing complex circuits
25. memorize the six basic trigonometric functions
26. solve right triangles using trigonometric functions and Pythagorean theorem
27. add vectors by component method
28. explain AC wave concepts of amplitude, frequency, period, peak value, root mean square value, and phase angles
29. analyze AC sine waves using phasors
30. apply the law of sines
31. apply the law of cosines

#### **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

None

#### **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

#### **G. SPECIAL INFORMATION**

None noted