COURSE OUTLINE

Course Number: MTH-080
Title: Technical Mathematics II
Approval Date: May 2013

Credits: 3
Length of Course: 44 lecture hours
For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

Grading Method: A-F or Pass/No Pass
Prerequisites: None
Co-requisites: None
Recommended: None
Required: None

Certified General Education Area(s): None
Related Instruction Area: None
Uses library resources: None

Department: Mathematics
Outline Developed by: Stefan Baratto
Course Approved as: Developmental Education

Course Description:
This course is the second in a sequence designed for career-technical students. The topics focus on critical thinking, problem solving, and mathematical communication using applications in arithmetic, algebra, geometry, and trigonometry.

Student Learning Outcomes:
Upon successful completion of this course, students will be able to:

1. demonstrate rigorous and analytical thinking by reading, writing, and utilizing the technical and logical language and symbolism necessary to do mathematics and be effective problem solvers;
2. solve a variety of “real world” math applications involving MTH 080 content,
3. read and comprehend technical mathematics writing,
4. effectively communicate mathematical information,
5. present mathematical and technical information in a professional manner,
6. work effectively as a team member to solve a variety of math problems,
7. work with a small group of students to explore and present a related mathematical topic complementing the content of this course,
8. demonstrate an understanding of the concept of a variable,
9. translate English phrases into algebraic expressions,
10. distinguish between an expression and an equation,
11. use algebra to model an application,
12. evaluate an algebraic expression,
13. identify like terms in an algebraic expression,
14. simplify an algebraic expression,
15. define the “solution” to an equation,
16. solve a linear equation in one variable,
17. check the solution(s) to an algebraic equation,
18. use linear equations to model applications,
19. solve problems modeled by linear equations,
20. model and solve business applications involving revenue, cost, profit, and marginal quantities;
21. find the break-even point for a product in business applications,
22. manipulate formulas and solve them for a particular variable,
23. model and solve motion problems,
24. model and solve mixture problems in a variety of application-settings,
25. model and solve percent problems,
26. use the work relationship to model and solve work problems,
27. solve problems involving resistance in parallel circuits,
28. construct a ratio to compare quantities with similar units,
29. construct a rate to compare quantities with different types of units,
30. simplify a rate,
31. solve a proportion,
32. use proportions to model and solve an application,
33. solve problems involving direct variation,
34. solve problems involving inverse variation,
35. define the basic trigonometric ratios on a right triangle: Sine, cosine, and tangent;
36. give trigonometric ratios as exact values for 30º, 45º, and 60º angles;
37. use a calculator to evaluate trigonometric ratios for any acute angle,
38. define and evaluate the reciprocal trigonometric ratios: Secant, cosecant, and cotangent;
39. Use the inverse trigonometric functions to find the measure of an angle in a right triangle,
40. solve a right triangle,
41. use right-triangle trigonometry to model and solve applications.

Major Topic Outline:

1. Introduction to Algebra.
2. Applications of Algebra in One Variable.
3. Ratios, Proportions, and Variation.
4. Right-Triangle Trigonometry.
AAOT/ASOT GENERAL EDUCATION OUTCOMES
COURSE OUTLINE MAPPING CHART

Mark outcomes addressed by the course:

- Mark “C” if this course completely addresses the outcome. Students who successfully complete this course are likely to have attained this learning outcome.
- Mark “S” if this course substantially addresses the outcome. More than one course is required for the outcome to be completely addressed. Students who successfully complete all of the required courses are likely to have attained this learning outcome.
- Mark “P” if this course partially addresses the outcome. Students will have been exposed to the outcome as part of the class, but the class is not a primary means for attaining the outcome and assessment for general education purposes may not be necessary.

This course does not include assessable General Education outcomes.

As a result of completing the AAOT/ASOT general education requirements, students will be able to:

WR: Writing Outcomes

- 1. Read actively, think critically, and write purposefully and capably for academic and, in some cases, professional audiences.
- 2. Locate, evaluate, and ethically utilize information to communicate effectively.
- 3. Demonstrate appropriate reasoning in response to complex issues.

SP: Speech/Oral Communication Outcomes

- 1. Engage in ethical communication processes that accomplish goals.
- 2. Respond to the needs of diverse audiences and contexts.
- 3. Build and manage relationships.

MA: Mathematics Outcomes:

- 1. Use appropriate mathematics to solve problems.
- 2. Recognize which mathematical concepts are applicable to a scenario, apply appropriate mathematics and technology in its analysis, and then accurately interpret, validate, and communicate the results.

AL: Arts and Letters Outcomes

- 1. Interpret and engage in the Arts & Letters, making use of the creative process to enrich the quality of life.
- 2. Critically analyze values and ethics within range of human experience and expression to engage more fully in local and global issues.

SS: Social Science Outcomes

- 1. Apply analytical skills to social phenomena in order to understand human behavior.
- 2. Apply knowledge and experience to foster personal growth and better appreciate the diverse social world in which we live.

SC: Science or Computer Science Outcomes

- 1. Gather, comprehend, and communicate scientific and technical information in order to explore ideas, models, and solutions and generate further questions.
- 2. Apply scientific and technical modes of inquiry, individually, and collaboratively, to critically examine the influence of scientific and technical knowledge on human society and the environment.
- 3. Assess the strengths and weaknesses of scientific studies and critically examine the influence of scientific and technical knowledge on human society and the environment.