NORMANDALE COMMUNITY COLLEGE **2/22/2012**
COMMON COURSE OUTLINE
MATH 1520, CALCULUS 2

I. EFFECTIVE DATE OF OUTLINE

Spring Semester, 2010. To be reviewed by the department annually.

II. CATALOG DESCRIPTION

A. MATH 1520
B. Calculus 2
C. 5 credits
D. Offered Fall and Spring Semesters
E. Prerequisite: MATH 1510 with a grade of C or higher; or approved equivalent preparation.
F. Continued development of the properties and applications of integration. Topics include infinite sequences and series; introduction to differential equations; calculus of polar coordinates and parametric equations. Applications include – but are not limited to – science, engineering, economics, and ecology. Satisfies MnTC Goal 4.

III. RECOMMENDED ENTRY SKILLS/KNOWLEDGE

Students are expected to have mastered and retained the material and skills developed in MATH 1500 and MATH 1510. To do well in this course, students should have excellent work habits and be dedicated to a complete understanding of concepts and their application.

IV. OUTLINE OF MAJOR CONTENT AREAS

A. Integration Techniques
B. Applications of Integration
C. Calculus of Polar Coordinates
D. Infinite Series
E. Differential Equations

V. LEARNING OUTCOMES

Upon successful completion of MATH 1520, students will be able to: (Letters in parentheses refer to student competencies of the Minnesota Transfer Curriculum, Goal 2–Critical Thinking, and Goal 4–Mathematical/Logical Reasoning.)

A. Evaluate integrals using antiderivatives, substitution, integrations by parts, partial fraction decompositions, trigonometric substitutions, and tables. (2a,2c,4c,4d)
B. Approximate definite integrals numerically using methods such as Midpoint Rule, Trapezoidal Rule, and Simpson's Rule.
C. Define and evaluate improper integrals and describe convergence behavior. (2c,4b,4c,4d)
D. Model selected applied problems from among geometry, physics, economics, and probability, such as arc length, moments and center of mass, volume, hydrostatic pressure and force, work, future value with continuous payments, measures of central tendency, and measures of dispersion. (2a,2b,2c,4a,4b,4c,4d)
E. Apply calculus to investigate curves defined by parametric equations and polar coordinates. (4a,4b,4d)
F. Examine convergence of infinite numeric series using standard tests.
G. Examine convergence of power series.
H. Approximate functions using Taylor polynomials and estimate errors.
I. Represent functions by power series and Taylor's series. (2c,4a,4c,4d)
J. Identify and apply basic solution techniques for elementary differential equations. (2d,4a,4c,4d)

VI. METHODS USED FOR EVALUATION OF STUDENT LEARNING

The instructor will choose from among various evaluation techniques including – but not limited to – in-class testing, take-home testing, assignments, quizzes, attendance, group or individual projects, and research. The instructor will also choose a method for end-of-the-semester evaluation. There will be a gateway exam on solving integrals without the help of tables or calculators. Passing this exam is required to pass the course.

VII. SPECIAL INFORMATION

Instructors will require some type of technology. This may include the use of one or more of a graphing calculator or computer algebra tools (such as the TI-89, MAPLE, Mathematica, or Wolfram Alpha).