MATH 1426: Calculus I

A. COURSE DESCRIPTION

   Credits: 4
   Lecture Hours/Week: 4
   Lab Hours/Week: *.*
   OJT Hours/Week: *.*

   Prerequisites:
   This course requires any of these three prerequisites
   MATH 1425 - Precalculus
   MATH 1432 - Principles of Trigonometry
   ATCC Calculus-Level Placement

   Corequisites: None

   MnTC Goals: Goal 04 - Mathematical/Logical Reasoning

   This course introduces students to the basic concepts of differential and integral calculus: beginning with the definition of limits, limits and continuity, progressing to differentiation and integration of functions, sketching of functions, application of definite integrals, concluding with the Fundamental Theorem of Calculus.

B. COURSE EFFECTIVE DATES: 05/16/2011 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

   1. Study the formal definition of limits.
   2. Evaluate finite, infinite, and one-sided limits.
   3. Investigate asymptotic behavior in functions.
   4. Calculate the slope of tangent lines.
   5. Calculate derivatives using the difference quotient.
   6. Calculate derivatives using the constant rule, power rule, and constant multiple rule.
   7. Use derivatives to calculate rate of change.
   8. Calculate derivatives of a variety of common functions.
   10. Solve problems related to the Mean Value Theorem.
   11. Calculate integrals by finding the area under a curve.
   12. Calculate a variety of basic integrals.

D. LEARNING OUTCOMES (General)

   1. The learner will demonstrate knowledge of the functions used in calculus and their basic properties.
   2. The learner will demonstrate ability to use practical problem solving skills using derivatives and integrals.
   3. The learner will learn the concept of the limit of a function graphically, numerically, and algebraically.
   4. The learner will apply the limits concept to average rates of change and understand the derivative as a measure of change.
   5. The learner will demonstrate ability to use the rules and techniques of differentiation.
E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

Goal 04 - Mathematical/Logical Reasoning

1. Illustrate historical and contemporary applications of mathematical/logical systems.
2. Clearly express mathematical/logical ideas in writing.
3. Explain what constitutes a valid mathematical/logical argument (proof).
4. Apply higher-order problem-solving and/or modeling strategies.

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted