MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE
COURSE OUTLINE

DEPT. MATH   **COURSE NUMBER: 1122**

NUMBER OF CREDITS: 4   **Lecture: 4 Lab: 0   OJT 0**

Course Title:
Calculus II

Catalog Description:
Calculus II calculates areas using definite integrals and continues to expand Calculus I concepts. Other topics include the calculus of transcendental functions, techniques of integration, applications of integration, differential equations and modeling, and infinite sequences and series, Taylor polynomials, and the Calculus of polar and parametric equations.

Prerequisites or Necessary Entry Skills/Knowledge:
MATH 1121

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

☒Goal 4: Mathematics/Logical Reasoning: By meeting the following competencies:
- Goal Area 4 is already met by the pre-requisite course MATH 1121
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Topics to be Covered (General)
Brief review of derivatives and antiderivatives
Areas and the Definite Integral
Evaluating integrals with the Fundamental Theorem of Calculus
Integration by Substitution and Integration by Parts
Integration Tables and Computer Algebra Systems
Applications of Definite Integrals: Areas, Volumes, Surface Areas, Lengths, Work, Fluid Force, Probability
Differential Equations
Separation of Variables
Growth and Decay Applications Logistic Applications
Sequences
Arithmetic and Geometric Series
Estimating Sums
Convergence of Series
Power Series
Binomial Series
Taylor Series and Polynomials and their Application
Using Series to Solve Differential Equations
Parametric Equations and Polar Coordinates and their Calculus

Student Learning Outcomes
Apply a variety of integration techniques, including u-substitution, integration by parts, trigonometric substitution, and partial fractions.
Use definite integrals to solve problems such as finding area, work, volume, arc length, fluid forces, and center of mass.
Determine convergence or divergence of an improper integral.
Approximate a definite integral using Simpson's Rule and/or the Trapezoid Rule.
Apply the definition of convergence to calculate the limit of a sequence or the sum of a convergent series.
Apply tests of convergence to determine the behavior of an infinite series.
Find Taylor series representations of basic functions.
Find the slope of a line tangent to a parametric curve.
Graph functions in polar coordinates and find slopes of tangent lines.

Is this course part of a transfer pathway: Yes ☒   No ☐

*If yes, please list the competencies below

Calculus II	MATH 1122: Calculus II
1. Apply a variety of integration techniques, including u-substitution, integration by parts, trigonometric substitution, and partial fractions.	1
2. Use definite integrals to solve problems such as finding area, work, volume, arc length, fluid forces, and center of mass.	2
3. Determine convergence or divergence of an improper integral.	3
4. Approximate a definite integral using Simpson's Rule and/or the Trapezoid Rule.	4
5. Apply the definition of convergence to calculate the limit of a sequence or the sum of a convergent series.	5
6. Apply tests of convergence to determine the behavior of an infinite series.	6
7. Find Taylor series representations of basic functions.	7
8. Find the slope of a line tangent to a parametric curve.	8
9. Graph functions in polar coordinates and find slopes of tangent lines.	9

Revised Date: 1/11/2024