

NorthWest Arkansas Community College
Division of Science and Mathematics

Course Number and Title

MATH 2554 Calculus I

Catalog Description

The first course in a three-semester sequence designed to provide comprehensive coverage of differential and integral calculus. Topics include limits and continuity, differentiation with applications, integration with applications, and basic differential equations.

Prerequisites

MATH 1204 and MATH 1213 OR MATH 1285 with grades of C or better, or appropriate placement scores.

Credit hours/Contact hours/Load hours

4 credit hours/ 4 contact hours/ 4 load hours

Target Audience/Transferability

This course is designed for transfer students who are interested in technical or science-based fields. It is the first in a sequence of three differential and integral calculus courses and transfers as such.

Student Learning Outcomes

Upon successful completion of this course students will exhibit mastery of certain knowledge and basic skills. These skills include, but are not limited to:

- 1) Analyze and evaluate limits (including infinite limits) graphically, numerically, and analytically.
- 2) Analyze functions for continuity.
- 3) Evaluate limits using L'Hopital's rules.
- 4) Evaluate derivatives by the limit process.
- 5) Memorize basic differentiation rules.
- 6) Evaluate derivatives for algebraic, trigonometric, inverse trigonometric, exponential and logarithmic functions and combinations thereof using basic differentiation rules including the product, quotient and chain rules.
- 7) Compute derivatives using implicit differentiation.
- 8) Evaluate derivatives using logarithmic differentiation.
- 9) Apply differentiation rules to evaluate rate of change and find equations of tangent lines
- 10) Solve related rate problems using differentiation.
- 11) Use differentiation techniques to evaluate absolute extrema.
- 12) Apply differentiation techniques to find intervals of increasing, decreasing and concavity, relative extrema and points of inflection.

- 13) Demonstrate knowledge of curve sketching.
- 14) Apply differentiation techniques to solve optimization problems.
- 15) Memorize basic integration rules.
- 16) Evaluate integrals and areas using the limit definition of definite integrals.
- 17) Evaluate definite integrals using the Fundamental Theorem of Calculus.
- 18) Evaluate definite and indefinite integrals using substitution.

Topics

1. Limits
2. Derivatives
3. Applications of Derivatives including related rates, graphing, and optimization
4. Integration

Forms of Assessment

Assessment of student learning outcomes will be administered according to the math department's current assessment plan.