Northwest Arkansas Community College

Division of Science and Mathematics

Discipline Code

MATH

Course Number

2043

Course Title

Survey of Calculus

Catalog Description

A survey and applications course in calculus designed for students in business, life sciences and social sciences. Topics include differentiation, curve sketching, exponential and logarithmic functions with applications, integration, and multivariable calculus.

Prerequisites

A grade of “C” or better in College Algebra (MATH 1204); a score of 24 – 28 on the math portion of the ACT; or a score of 46 – 99 on the College Algebra section of the COMPASS.

Credit Hours

3 credit hours

Contact Hours

3 contact hours

Load Hours

3 load hours

Target Audience/Transferability

This course is targeted primarily at students in business and life or social sciences. It is required of some AAS and AS degrees as well as a variety of four-year programs. It transfers as 3 credit hours of business calculus.

Student Learning Outcomes

Upon successful completion of Survey of Calculus, a student should be able to do the following. Other skills may also be required.

1. Algebraically, analytically, and graphically evaluate limits.
2. Find basic derivatives using the definition, product, quotient and chain rules, and by implicit differentiation.

3. Understand and apply derivatives appropriately to real-world problems to optimize functions and to find instantaneous rates of change, marginal cost, marginal profit, relative rates of change, elasticity of demand, etc.
4. Graph functions by hand, including manually finding the extrema using the first derivative test, intervals where the graph is increasing and decreasing, and finding points of inflection.
5. Integrate “basic” integrals including polynomial functions, natural exponential functions, and ones requiring basic u-substitutions.
6. Apply integrals appropriately to find the areas under and between curves, average value, accumulated value, consumer’s surplus and producer’s surplus.
7. Find partial derivatives and use them to optimize functions of several variables, including using constrained optimization and Lagrange Multipliers.

Required Instructional Activities

The content of the course should be taught with graphing calculators as an available tool when appropriate.

Required Forms of Assessment

As part of our departmental outcomes assessment program, each instructor must include six departmental questions on his or her final exam. These questions will relate to the General Course Objectives and the Departmental Final Exam Review. These six questions should be evenly weighted on the final and should comprise at least 10% of each student’s overall grade for the course. The questions will be graded using a departmental grading rubric utilizing a 10-point scale. Instructors are required to fill out a report for each of their classes listing the score of each individual student on each of the six departmental questions. *Please note that the only resource other than a graphing calculator allowed for use by students during the final exam will be a departmental formula sheet for survey of calculus. It is also a departmental policy that no TI-89 or TI-92 or comparable calculators be allowed for use during the final exam.*