

Northwest Arkansas Community College
Science and Mathematics Division

Discipline Code

MATH

Course Number

2574

Course Title

Calculus III

Catalog Description

A continuation of MATH 2564. Topics include parametric curves, vectors and vector-valued function, surfaces, partial differentiation, multiple integrals and vector calculus.

Prerequisites

MATH 2554 and 2564 with a grade of C or better.

Credit Hours

4 credit hours

Contact hours

60 contact hours

Load hours

4 load hours

Semesters Offered

Fall and Spring

ACTS Equivalent

MATH 2603, Calculus III

Grade Mode

A-F

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:

- Analyze and perform operations with vectors
- Graph in 3-space
- Use calculus of vector-valued functions including velocity, acceleration, arc-length and curvature
- Differentiate multivariate functions
- Calculate and analyze the directional derivative and gradient
- Optimize functions of several variables using the Second Partial Test and Lagrange Multipliers
- Integrate and apply techniques of multiple integration
- Set up, analyze, and evaluate integrals using vector calculus (including line integrals, Green's Theorem, Divergence Theorem, Stokes' Theorem)

- **General Education Outcomes Supported**
- Students develop higher order thinking skills.
- Students achieve mathematical literacy

Standard Practices

Topics list

- Vectors and the Geometry of Space
- Vector-Valued Functions
- Functions of Several Variables including, but not limited to, Partial Derivatives, Directional Derivatives, and Optimization
- Multiple Integration including rectangular, cylindrical, and spherical coordinate systems
- Vector Calculus including line integrals, Green's Theorem, Stokes' Theorem, and Divergence Theorem

Learning activities

- Courses must, at a minimum, cover the core learning outcomes for each topic. Faculty may add to these outcomes, but may not omit any of them.
- The content of the course may be taught with or without the use of a graphing calculator as deemed appropriate by the instructor.

Assessments

- There will be a common departmental portion on the required comprehensive final exam.
- These questions will be in direct support of the Learning Outcomes.
- Instructors will report the results of the individual departmental questions when grades are submitted.

Grading Guidelines

- At least 70% of the student's final grade should come from proctored work.