



0701M375

Multivariable Calculus

Instructor: TBA

E-mail: TBA

Time: May 17, 2027 - June 18, 2027

Office Hours: by appointment

Contact Hours: 60 (50 minutes each)

Credits: 4

Course Description

This course includes a study of the calculus of functions of two or more variables, including limits and partial derivatives of these functions. It also includes a study of three dimensional analytic geometry and vector algebra, and multiple integrals with applications in engineering and science. You will be responsible for the proofs shown.

Required Textbook

M. Weir and J. Hass, *Thomas' Calculus: Early Transcendentals*, 12th edition, Addison-Wesley, (Pearson,) Reading, MA. ISBN: 978-0-321-58876-0

On Coursesmart as eText: ISBN-13 9780321640932

Prerequisites

0701M230 Calculus II

We assume students are familiar with the standard content of a calculus course for scientists and engineers. This includes the study of limits, derivatives, optimization of functions of a single variable, techniques of integration, and the fundamental theorem

of calculus. Moreover, they should have studied this material in the context of algebraic, exponential, logarithmic, and trigonometric functions. Certain mathematical maturity is expected due to more advanced content of the class.

Course Outline

Please note that the outline is meant to give an overview of the major concepts in this course. Changes may occur as needed to aid in the student's development.

Module 1: VECTORS

- Three-Dimensional Coordinate Systems.
- Vectors.
- Dot Product.
- Cross Product

Homework

Quiz 1

Module 2: GEOMETRY OF SPACE

- Equations of Lines and Planes
- Cylinders and Quadric Surfaces

Homework

Quiz 2

Module 3: VECTOR FUNCTIONS

- Vector Functions and Space Curves.
- Derivatives and Integrals of Vector Functions.

Homework

Quiz 3

Module 4: APPLICATIONS OF SPACE CURVES

- Arc Length and Curvature.
- Motion in Space: Velocity and Acceleration.

Homework

Quiz 4

Module 5: FUNCTIONS OF SEVERAL VARIABLES

- Functions of Several Variables.
- Limits and Continuity.

Homework

Quiz 5

Midterm Exam

Module 6: PARTIAL DERIVATIVES AND APPLICATIONS

- Partial Derivatives.
- Tangent Planes and Linear Approximation

Homework

Quiz 6

Module 7: APPLICATIONS OF PARTIAL DERIVATIVES

- Chain Rule.
- Directional Derivatives and the Gradient Vector.
- Maximum and Minimum Values.

Homework

Quiz 7

Module 8: MULTIPLE INTEGRALS

- Double Integrals over Rectangles.
- Double Integrals over General Regions.

Homework

Quiz 8

Module 9: APPLICATIONS OF MULTIPLE INTEGRATION

- Surface Area.
- Triple Integrals.

Homework

Quiz 9

Final Exam

Grading Policy

9 Quizzes	36 %
Homework	15 %
Midterm Exam	21 %
Final Exam	28%
TOTAL	100 %

Grading Scale

The instructor will use the grading system as applied by JNU:

Definition	Letter Grade	Score
Excellent	A	90~100
Good	B	80~89
Satisfactory	C	70~79
Poor	D	60~69
Failed	E	Below 60

Academic Integrity

As members of the Jinan University academic community, students are expected to be honest in all of their academic coursework and activities. Academic dishonesty, includes (but is not limited to) cheating on assignments or examinations; plagiarizing, i.e., misrepresenting as one's own work any work done by another; submitting the same paper, or a substantially similar paper, to meet the requirements of more than one course without the approval and consent of the instructors concerned; or sabotaging other students' work within these general definitions. Instructors, however, determine what constitutes academic misconduct in the courses they teach. Students found guilty of academic misconduct in any portion of the academic work face penalties that range from the lowering of their course grade to awarding a grade of E for the entire course.