

0701M375

Multivariable Calculus

Instructor: TBA

Time: October 16, 2023 - November 17, 2023

Office Hours: 2 hours (according to the teaching schedule)

Contact Hours: 60 (50 minutes each)

Credits: 4

E-mail: TBA

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 Coursmart 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

There are **quizzes on Mondays**, a **midterm on the third Friday** and a **Final Exam on the final Friday**. As well, homework will be due throughout the weeks.

Week 1.

VECTORS AND THE GEOMETRY OF SPACE.

- Three-Dimensional Coordinate Systems.
- Vectors.
- Dot Product.
- Cross Product
- Equations of Lines and Planes
- Cylinders and Quadric Surfaces

Week 2.

- **Quiz on Monday**

VECTOR FUNCTIONS.

- Vector Functions and Space Curves.
- Derivatives and Integrals of Vector Functions.
- Arc Length and Curvature.
- Motion in Space: Velocity and Acceleration.

Week 3.

- **Quiz on Monday**

PARTIAL DERIVATIVES.

- Functions of Several Variables.
- Limits and Continuity.
- Partial Derivatives.
- **Midterm of Friday**

Week 4.

- **Quiz on Monday**
- Tangent Planes and Linear Approximation.
- Chain Rule.
- Directional Derivatives and the Gradient Vector.
- Maximum and Minimum Values.

MULTIPLE INTEGRALS.

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

Week 5.

- **Quiz on Monday**
- Surface Area.
- Triple Integrals.
- Final Exam Review
- **Final Exam on Friday**

Grading Policy

Quizzes	20 %
Homework	20 %
Midterm Exam	30 %
Final Exam	30%
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.