



## Hunan University MATH 31: Calculus III (Multivariable Calculus)

**Professor:** To be announced

**Total contact hours:** 54 hours

**Credit:** 4

### *Course Description*

Multivariate Calculus: vectors and the geometry of space, vector-valued functions, partial derivatives, multiple integration, vector calculus

### *Required Textbook*

*Calculus: Early Transcendentals* (6th edition), by James Stewart

### *Grading*

- Homework 15%
- Midterm 1 25%
- Midterm 2 25%
- Final 35%

A+ 96-100	A 90-95	A- 85-89
B+ 82-84	B 78-81	B- 75-77
C+ 71-74	C 66-70	C- 62-65
D 60-61	F < 60	

### *Course Schedule*

The course has 24 class sessions in total. All sessions are 2 hours and 15 minutes in length.  
Note: the course outline and required readings are subject to change.

Class 1:

Three-Dimensional Coordinate Systems

Class 2:

Vectors; The Dot Product; The Cross Product



Class 3:

Equations of Lines and Planes; Cylinders and Quadric Surfaces

Class 4:

Vector Functions and Space Curves

Class 5:

Derivatives and Integrals of Vector Functions

Class 6:

Arc Length and Curvature

Class 7:

Motion in Space: Velocity and Acceleration

Review for midterm

Midterm No. 1

Class 8:

Functions of Several Variables; Limits and Continuity

Class 9:

Partial Derivatives

Class 10:

Tangent Planes and Linear Approximations

The Chain Rule

Class 11:

Directional Derivatives and the Gradient Vector

Class 12:

Maximum and Minimum Values; Lagrange Multipliers

Class 13:

Double Integrals over Rectangles and General Regions

Class 14:

Double Integrals in Polar Coordinates

Class 15:

Applications of Double Integral

Review for midterm

Midterm No. 2



Class 16:

Triple Integrals in Cylindrical and Spherical Coordinates

Class 17:

Change of Variables in Multiple Integrals

Class 18:

Vector Fields; Line Integrals

Class 19:

Green's Theorem; Curl and Divergence

Class 20:

Parametric Surfaces and Their Areas

Class 21:

Surface Integrals

Class 22:

Stokes' Theorem

Class 23:

The Divergence Theorem

Review for final exam

Class 24:

Final Exam

### ***Attending Policy***

Regular and prompt attendance is required. Under ordinary circumstances, you may miss two times without penalty. Each absence over this number will lower your course grade by a third of a letter and missing more than five classes may lead to a failing grade in the course. Arriving late and/or leaving before the end of the class period are equivalent to absences.

### ***Policy on "Late Withdrawals"***

In accordance with university policy, appeals for late withdrawal will be approved ONLY in case of medical emergency and similar crises.

### ***Academic Honesty***

Hunan University expects all students to do their own work. Instructors will fail assignments that show evidence of plagiarism or other forms of cheating, and will also report the student's



name to the University administration. A student reported to the University for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

### ***General Expectations:***

Students are expected to:

- Attend all classes and be responsible for all materials covered in class and otherwise assigned;
- Complete the day's required reading and assignments before class;
- Review the previous day's notes before class and make notes about questions you have about the previous class or the day's reading;
- Participate in class discussions and complete required written work on time;
- Refrain from texting, phoning or engaging in computer activities unrelated to class during the class period;
- While class participation is welcome, even required, you are expected to refrain from private conversations during the class period.

### ***Special Needs or Assistance***

Please contact the Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material. Our goal is to help you learn, not to penalize you for issues which mask your learning.