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Nanchang University
MATH31: Calculus III
(Last Updated in Jan. 2025)

Credit: 4

Contact Hours

This course is composed of 24 lecture sessions, 3 tutorial sessions and 9 office contact hours. Each lecture session takes 2 contact hours in length; each tutorial session takes 3 contact hours in length; There will be a Q-A review session (3 contact hours) and Final Exam (3 contact hours) at the end of this term. This course has 72 contact hours in total.

Course Description

Multivariate Calculus stands for a starting point of advance mathematics and is used in various disciplines, we will cover: vectors and the geometry of space, vector-valued functions, partial derivatives, multiple integration, vector calculus.

Note: This Syllabus is subject to change based on the needs of the class.

Required Material

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

Grading

- Participation 10%
- Homework 20%
- Midterm 1 20%
- Midterm 2 20%
- Final 30%

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 contact hours in length. At the end of this term, there will be a Q-A review session(3 contact hours) and Final Exam (3 contact hours).
Note: the course outline and required readings are subject to change.

Class 1:
Polar Coordinates; Parametric Equation

Class 2:
Three-Dimensional Coordinate Systems;
Vectors; The Dot Product; The Cross Product

Class 3:
Equations of Lines and Planes; Surfaces in Three Space

Class 4:
Vector functions;
Derivatives and Integrals of Vector Functions

Class 5:
Arc Length and Curvature;Motion in Space: Velocity and Acceleration
Cylindrical and Spherical Coordinates and Space Curves;

Class 6:
Vector Valued Functions & Curvilinear Motion;
Review for midterm

Class 7:
Midterm No. 1

Class 8:
Functions of Several Variables; Limits and Continuity

Class 9:
Partial Derivatives;Differentiability;
Tangent Planes and Linear Approximations

Class 10:
The Chain Rule

Class 11:
Directional Derivatives and Gradients

Class 12:
Maximum and Minimum Values; Lagrange Multipliers

Class 13:
Double Integrals over Rectangles;
Iterated Integrals and General Regions

Class 14:
Double Integrals in Polar Coordinates

Class 15:
Applications of Double Integral; Surface Area
Midterm II

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:
The Fundamental Theorem for Line Integrals

Class 20:
Independence of Path; Green's Theorem

Class 21:
Curl and Divergence

Class 22:
Surface Integrals

Class 23:
Stokes' Theorem;
Gauss's Divergence Theorem

Class 24:
Second order differential equation;
Review for 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

Nanchang 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.