



MATH 2210: Calculus III

2023 Summer Session	
Total Class Sessions: 25 Class Sessions Per Week: 5 Total Weeks: 5 Class Session Length (Minutes): 145 Credit Hours: 4	Instructor: Staff Classroom: TBA Office Hours: TBA Language: English

Course Description:

Topics in this course include: Vectors, lines, planes; Multiple integration; Cylindrical and spherical coordinates; Functions of several variables: partial derivatives, gradients, chain rule, directional derivative, maxima/minima; Scalar and vector fields, potentials, approximation, multivariate minimization; Derivatives of vector valued functions, velocity and acceleration; Stokes's and related theorems; Green's theorem.

Prerequisite: MATH 1220 or equivalent 2nd year calculus course.

Course Materials:

Essential Calculus: Early Transcendentals,
James Stewart, 2nd edition

Course Format and Requirements:

Attendance:

Students are expected to attend and participate in class. Missing class is the most common reason for poor performance in the course. If you miss a class, you are responsible for obtaining notes for that class from a student who attended. It is also your responsibility to find out about any announcements made in class.

Course Assignments:

Quizzes:

There will be 5 quizzes administered through the whole semester and the LOWEST score will be dropped. Quizzes will always be completed in the first ten minutes of class. The quiz problems will be similar to homework problems and in-class examples. There will be no make-up quizzes.

Exams:

Midterm Exams

There will be three in-class, close-book and non-cumulative midterm exams in this course. The midterm exams will be based on concepts covered in class.

**Final Exam**

The final will be cumulative and close-book. Note that the final will not be taken during the normal class times. Exact time and location for final will be announced later.

Course Assessment:

Quizzes	15%
Midterm Exams 1	20%
Midterm Exams 2	20%
Midterm Exams 3	20%
Final Exam	25%
Total	100%

Grading Scale (percentage):

A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
98-	93-	90-	88-	83-	80-	78-	73-	70-	68-	63-	60-	<60
100	97	92	89	87	82	79	77	72	69	67	62	

Academic Integrity:

Students are encouraged to study together, and to discuss lecture topics with one another, but all other work should be completed independently.

Students are expected to adhere to the standards of academic honesty and integrity that are described in the Chengdu University of Technology's *Academic Conduct Code*. Any work suspected of violating the standards of the *Academic Conduct Code* will be reported to the Dean's Office. Penalties for violating the *Academic Conduct Code* may include dismissal from the program. All students have an individual responsibility to know and understand the provisions of the *Academic Conduct Code*.

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.

Course Schedule:

Class 1:

\mathbb{R}^n as a vector space

Dot product, angles and orthogonal projection

Lines, planes, and hyperplanes



Class 2:

Cross product

Functions of a single variable

Linear Subspaces

Class 3:

Multivariable functions

Curves

Class 4:

Quiz 1

Arc Length

Graphing surfaces

Class 5:

Partial derivatives

Linear approximation, tangent planes, and the differential

Class 6:

Quiz 2

Differentiation rules

Directional derivatives

Class 7:

Level sets and gradient vectors

Parameterizing surfaces

Class 8:

Midterm 1

Class 9:

Local extrema

Extreme Values and Saddle Points

Class 10:

Optimization

Class 11:



Lagrange multipliers

Iterated integrals

Class 12:

Quiz 3

Double Integrals

Polar coordinates

Class 13:

Area and Double Integrals in Polar Form

Triple Integrals in Rectangular Coordinates

Class 14:

Triple Integrals in Rectangular Coordinates (Cont.)

Volume

Review for midterm 2

Class 15:

Midterm 2

Class 16:

Cylindrical and spherical coordinates

Density and mass

Class 17:

Density and mass (Cont.)

Triple Integrals in Cylindrical and Spherical Coordinates

Class 18:

Quiz 4

Surfaces and area

Vector fields

Class 19:

Integration in Vector Fields

Line integrals

Class 20:

Path Independence



Conservative vector fields
Review for Midterm 3

Class 21:
Midterm 3

Class 22:
Potential Functions
Green's Theorem

Class 23:
Quiz 5
Flux through a surface
The Divergence Theorem

Class 24:
The Divergence Theorem (Cont.)
Stokes' Theorem

Class 25:
Summary of Course
Review for Final

Final Exam (Cumulative): TBA