MATH 031: Calculus III

Term: 2020 Winter Session Instructor: Staff Language of Instruction: English Classroom: TBA Office Hours: TBA
Class Sessions Per Week: 5 Total Weeks: 3 Total Class Sessions: 15 Class Session Length (minutes): 240 Credit Hours: 4

Course Description:

In this course, students will discuss and explore topics including: 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 021 or equivalent 2nd year calculus course.

Course Materials:

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

Course Format and Requirements:

This course has 15 class sessions in total. Each class session is 240 minutes in length.

Please do not use electronic devices such as phones, iPads, computers, etc. during the lectures.

Attendance

Students are expected to attend and participate in class. Strong attendance and participation are good indicators of success. Each student is responsible for all course material, announcements, quizzes and exams made in class, whether or not the student attended that day's class.

Grading Scale:

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

Course Assignments:

Quizzes

There will be 5 quizzes administered through the whole semester. 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.

Midterm Exams

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

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	25%
Midterm Exams 2	25%
Final Exam	35%
Total	**100%**

Course Schedule:

Week 1- Class 1	Week 1- Class 2
Go through Syllabus R^n as a vector space Dot product, angles and orthogonal projection Lines, planes, and hyperplanes	Cross product Functions of a single variable Linear Subspaces Multivariable functions Curves ***Quiz 1***
Week 1- Class 3	Week 1- Class 4
Arc Length Graphing surfaces Partial derivatives Linear approximation, tangent planes, and the differential	Differentiation rules Directional derivatives Level sets and gradient vectors Parameterizing surfaces
Week 1- Class 5	Week 2- Class 6
Local extrema Extreme Values and Saddle Points ***Midterm exam 1***	Lagrange multipliers Iterated integrals Double Integrals Optimization ***Quiz 2***
Week 2- Class 7	Week 2- Class 8
Polar coordinates Area and Double Integrals in Polar Form	***Quiz 3*** Cylindrical and spherical coordinates

Triple Integrals in Rectangular Coordinates Volume	Density and mass
Week 2- Class 9	Week 2- Class 10
Triple Integrals in Cylindrical and Spherical Coordinates Surfaces and area	Vector fields ***Midterm exam 2***
Week 3- Class 11	Week 3- Class 12
Integration in Vector Fields Line integrals Path Independence	Conservative vector fields Potential Functions ***Quiz 4***
Week 3- Class 13	Week 3- Class 14
Green's Theorem Flux through a surface	***Quiz 5*** The Divergence Theorem Stokes' Theorem
Week 3- Class 15	***Final Exam (Cumulative): TBA***
Summary of Course Revision	

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 Shanghai Normal University'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.