MATH 031: Calculus III

Term: 2020 Winter Session Instructor: Staff Language of Instruction: English Classroom: TBA Office Hours: TBA
Class Sessions Per Week: 6 Total Weeks: 4 Total Class Sessions: 25 Class Session Length (minutes): 145 Credit Hours: 4

Course Description:

Topics discussed 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 021 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. 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
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
Week 1- Class 3	Week 1- Class 4
Multivariable functions Curves	***Quiz 1*** Arc Length Graphing surfaces
Week 1- Class 5	Week 1- Class 6
Partial derivatives Linear approximation, tangent planes, and the differential	***Quiz 2*** Differentiation rules Directional derivatives
Week 2- Class 7	Week 2- Class 8
Level sets and gradient vectors Review for Midterm 1	***Midterm 1***
Week 2- Class 9	Week 2- Class 10
Parameterizing surfaces Local extrema	Extreme Values and Saddle Points Optimization
Week 2- Class 11	Week 2- Class 12
Lagrange multipliers Iterated integrals	***Quiz 3*** Double Integrals Polar coordinates
Week 3- Class 13	Week 3- Class 14

Area and Double Integrals in Polar Form Triple Integrals in Rectangular Coordinates	Triple Integrals in Rectangular Coordinates (Cont.) Volume
Week 3- Class 15	Week 3- Class 16
Quiz 4 Cylindrical and spherical coordinates Density and mass	Density and mass (Cont.) Triple Integrals in Cylindrical and Spherical Review for Midterm 2
Week 3- Class 17	Week 3- Class 18
Midterm 2	Coordinates Surfaces and area
Week 4- Class 19	Week 4- Class 20
Vector fields Integration in Vector Fields	Line integrals Path Independence
Week 4- Class 21	Week 4- Class 22
Quiz 5 Path Independence Conservative vector fields	Potential Functions Green's Theorem
Week 4- Class 23	Week 4- Class 24
Flux through a surface The Divergence Theorem	The Divergence Theorem (Cont.) Stokes' Theorem
Week 4- Class 25	***Final Exam (Cumulative): TBA***
Summary of Course Review for Final	

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.