MAC 2313

Multivariable Calc

Section: U05

In Person

Spring Term 2026

Course Meeting Information

Classes are scheduled from 4:30 pm till 6:10 pm

on Monday and Wednesday in DM 110

Professor Information

Mirroslav Yotov

Roles: Primary Instructor

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Office Hours: TuTh 10:30am - 12:00 Noon (Zoom)

Office Location: DM 413A

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Department or Academic Unit: Mathematics and Statistics

Course Prerequisites

Course prerequisites, if any, are listed below.

Prerequisite: MAC2312"C"

Course Description

University Core Curriculum Category: Mathematics

This course deals with the differential and integral calculus of real valued multivariable functions.

Covered topics: Directional and partial derivatives, gradients and their applications; differential calculus of vector valued functions; multiple, iterated, line and surface integrals.

Course Goals

Material to be covered:

- Chapter 13: Vector and Geometry of Space
- Chapter 14: Vector Valued Functions
- Chapter 15: Functions of Several Variables

- Chapter 16: Multiple Integration
- Chapter 17: Vector Fields

UCC Category Description

This course satisfies the University Core Curriculum **Mathematics**, **Group 2** requirement.

Mathematics courses afford students a mastery of foundational mathematical and computation models and methods by applying such models and methods in problem solving.

Student Learning Outcomes/Objectives

- Demonstrate understanding vectors, their algebraic structure and the geometry they represent. Graphing lines, planes and simple surfaces in 3-space.
- Demonstrate the ability to do calculus with vector-valued functions and how to use them to represent an object's motion in 3-space.
- Demonstrate understanding the differential calculus of multivariable functions, including linearization and optmization problems.
- Demonstrate the ability to compute multiple integrals in Euclidean and other coordinates and understand applications of these integrals.
- Demonstrate understanding vector fields, the differential operators div, curl and grad, and the relationship between their actions on vector fields through integration. Demonstrate also understanding of the physical meaning of the named operators and how to apply them.

Expectations of the Course

Students are expected to attend class regularly, submit assignments on time.

Assignments & Assessments

Quizzes:

Every lecture will be accompanied by a ten minutes Quiz. The Quiz will be administered at the beginning or at the end of the lecture.

Exams:

Exams: There will be a 30-minute Test 0, three 100-minute Midterms and a 120-minute Final Exam.

- Test 0 is scheduled for January 10th.
- The Midterm dates are Wednesday, February 4th (on Ch. 13-14); Wednesday, March 25th (on Ch. 15-16); and Monday, April 13th (on Ch. 17).
- The Final Exam is comprehensive; its schedule will be announced later.

There are no make-up exams. A missed exam can be waived upon presentation of valid and verifiable proof of an emergency at the time of scheduled examination. The final exam is mandatory and cannot be waived.

Testing Protocol:

- Please keep back-packs, electronic devices away from your desk during exam.
- Prepare before coming to your exam; No bathroom breaks allowed.
- No admission to testing will be allowed after 15 minutes past the beginning of testing.
- Please, bring your ID!

Grading

Grading

Course Requirements	Number of Items	Points for Each	Total Points Available	Weight
MyMathLab, Quizzes				15%
Exams	3	20	60	60%
Final	1	25	25	25%
				100%
Total				

Grading Scheme

sample grading

Letter	Range%	Letter	Range%	Letter	Range%
A	90 or above	B	80-83	C	70-75
A-	85-90	B-	78-80	D	60-70
B+	83-85	C+	75-78	F	60 or less

Textbook and Course Materials

Calculus, Early Transcendentals

Required/Recommended: required

Authors: Briggs, Cochran, Gillet and schulz

Publisher: Pearson

Publication Date: 2019

Copyright Date: 2019, 2015, 2011

ISBN 10: 0-13-476364-5

ISBN 13: 978-0-13-476364-4

Chapters/Pages: Chapters 13-17

CALCULUS:EARLY TRANS.-MYLAB+ETXT ACC

Required/Recommended: Multivar Calc

Authors: BRIGGS

Publisher: VST

Publication Date: 2019

Copyright Date: 2019

ISBN 10: 0-13-476364-5

ISBN 13: 8220144726044

Chapters/Pages: 13-17

Panther Book Pack

Get all required course materials for $20.50 per undergrad credit hour through Panther Book Pack. You'll be charged automatically unless you opt out within 3 days after the add/drop deadline.

For more details, to compare costs, and to learn how to access your course materials, visit the Panther Book Pack information page on FIU OneStop.

Course Communication

Communication in this course will take place via the Canvas Inbox. Check out the Canvas Conversations Tutorial or Canvas Guide to learn how to communicate with your instructor and peers using Announcements, Discussions, and the Inbox. I will respond to all correspondences within 24 hours.

Schedule of Topics

Chapter 13 (January 5th-January 14th) Vectors and Geometry of Space

13.1 Vectors in the Plane. 13.2 Vectors in three dimensions. 13.3 Dot Products. 13.4 Cross Products .13.5 Lines and Planes in Space. 13.6 Cylinders and Quadric Surfaces

Chapter 14 (January 21st -February 2nd) Vector-Valued Functions

14.1 Vector-Valued functions. 14.2 Calculus of Vector-Valued Functions. 14.3 Motion in Space. 14.4 Length of Curves. 14.5 Curvature and Normal Vectors Notes: Torsion is optional and usually omitted (in 14.5).

Chapter 15 (February 9th-March 2nd) Functions of several variables

15.1 Graphs and Level Curves 15.2 Limits and Continuity 15.3 Partial Derivatives.15.4 The Chain Rule. 15.5 Directional Derivatives and the Gradient. 15.6 Tangent Planes and Linear Approximation. 15.7 Maximum/ Minimum Problems. 15.8 Lagrange Multipliers (optional)

Chapter 16 (March 4th-March 23rd) Multiple Integration

16.1 Double Integrals over Rectangular Regions. 16.2 Double Integrals over General Regions. 16.3 Double Integrals in Polar Coordinates. 16.4 Triple Integrals. 16.5 Triple Integrals in Cylindrical and Spherical Coordinates. 16.6 Integrals for Mass Calculations (just the basics, and more if time allows). 16.7 Change of Variables in Multiple Integrals. (just the basics, and more if time allows)

Chapter 17 (March 30th-April 16th) Vector fields

17.1 Vector Fields. 17.2 Line Integrals. 17.3 Conservative Vector Fields. 17.4 Green's Theorem. 17.5 Divergence and Curl. 17.6 Surface Integrals. 17.7 Stokes Theorem. 17.8 Divergence Theorem.

Policies & Resources

As a member of the FIU community, you are expected to be knowledgeable about the behavioral expectations set forth in the FIU Student Conduct and Honor Code.

In addition, the FIU Policies and Procedures Library website serves as the official repository for university-wide policies and procedures.

Nondiscrimination Statement

The **Office of Civil Rights Compliance and Accessibility** (CRCA) is responsible for ensuring that FIU maintains a workplace and learning environment free from discrimination, where current and prospective faculty, staff, and students are treated equitably. If any student, employee, or applicant has a sincere and reasonable belief that they have been discriminated against or harassed based on age, color, disability, marital status, ethnic or national origin, race, religion, retaliation, sex, or any other protected category, they can report their concerns to the CRCA team through report.fiu.edu.