MAT 213 Calculus 3

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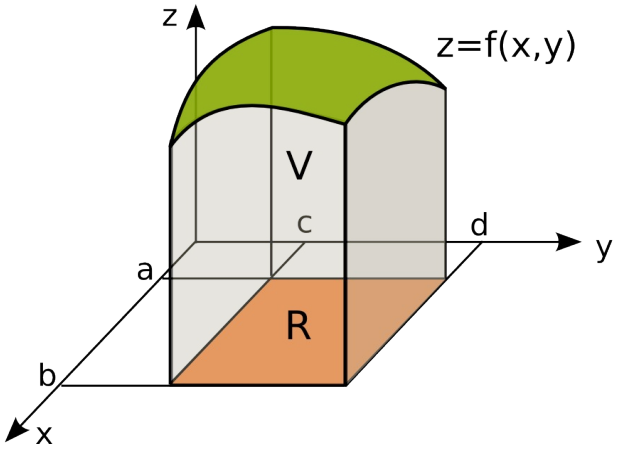


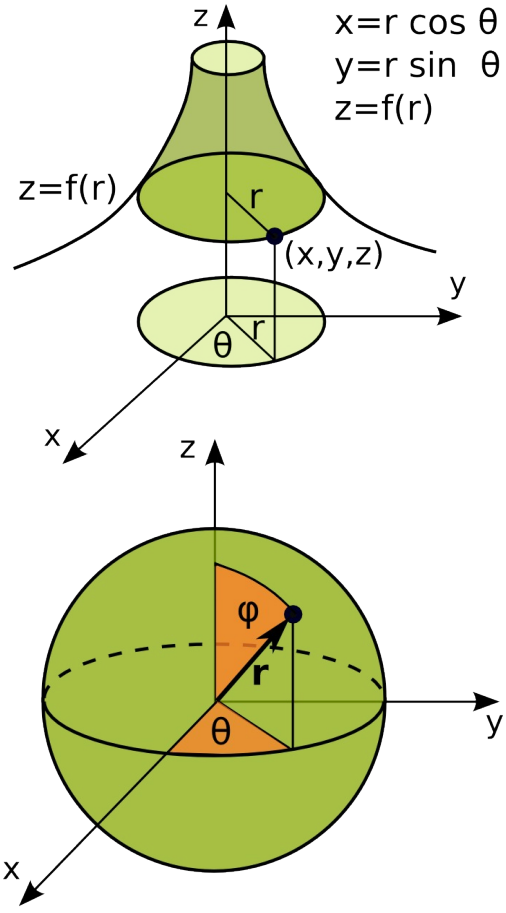
Class times, Fall 2025: M and W 1:50 – 3:05,
Fri 1:50 – 2:40.

Class meeting location, Fall 2025: BL 221 (HH campus)

Website: http://liavas.net (class handouts, review sheets, video recordings).
Canvas: The solutions of any graded material (assignments, projects, and exams) will be posted on Canvas and, also, emailed to you.

Office hours, Fall 2025 are by appointment: email me and we will find a time for us to meet. I will be glad to answer all of your questions about the course material, go over some problems together with you, check your assignment work, review together for an exam, or discuss any course content you may have questions about.

Topics covered:
1. Three Dimensional Coordinate System. Surfaces in Space
2. Review of Vectors. Dot and Cross Products
3. Lines and Planes in Space
4. Space Curves. Derivatives and Integrals. Arc Length
5. Partial Derivatives. Chain Rule
6. Tangent Planes. Gradient Vector. Linear Approximations
   (Exam 1)
7. Maximum and Minimum Values
8. Lagrange Multipliers
9. Double Integrals. Double Integrals in Polar Coordinates
10. Surface Area. Applications
    (Exam 2)
11. Parametric Surfaces
12. Triple Integrals. Substitution in Triple Integrals
13. Line Integrals
14. Fundamental Theorem, Green's Theorem, curl and divergence
    (Exam 3)
15. Sequences. Series
16. Integral Test, Alternating Series. Ratio and Root Tests.
17. Power Series.
18. Taylor Series. Applications
    (Final Exam)



Text: No textbook required. Handouts with course material and practice problems are on my website. The course topics match chapters 12 – 16, and sections 17.1 – 17.6 (without 12.11, 13.6, 14.4, and 15.2) of *Calculus* by James Stewart (published by Brooks/Cole) which also

covers topics of Calculus 1 and 2 courses.

Tentative Exam Schedule, Fall 2025:

Exam 1. During week 4 (Sept 17)
Exam 2. During week 7 (Oct 8)
Exam 3. During week 11 (Nov 5)
Final Exam. During the finals week

Grading:

Three Exams	18% each
Final Exam	24%
Homework Assignments	11%
Projects	11%
TOTAL	**100%**

Grades are computed according to the following system:

letter grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F
number grade	93 to 100	90 to 92	87 to 89	83 to 86	80 to 82	77 to 79	73 to 76	70 to 72	67 to 69	60 to 66	0 to 59

Relevant Course Elements.

Number of credits: 4

Prerequisites: Calculus 2 (MAT 162) or the permission of instructor.

Attendance: It is important that students attend classes. Students are responsible for all material covered in class, even if attendance is not checked or assignments collected.

Recordings of the lectures are available on my website. To stay on track, it is highly recommended that students attend the classes and use the recordings just for reference.

Technology: All students are required to have a graphing calculator.

Exams: There will be **three semester exams and a cumulative final exam.** No makeup exam will be given unless the excuse for missing the scheduled exam is acceptable to the instructor. Any makeup exam must be taken **before** the next regularly scheduled exam. No exam grade will be dropped.

Assignments and projects: There will be **four assignments and two Matlab projects** during the semester. There will be no makeup assignments or projects. Assignments turned in after their due date will receive an automatic reduction in grade. No assignment or project grade will be dropped.

Course Objectives.

- Students will obtain a well rounded introduction to the area of multivariable function calculus and number and power series.
- Students will further develop problem solving techniques required for successful application of mathematics obtained in previous calculus courses.
- Students will competently use appropriate technology to model data, implement mathematical algorithms and solve mathematical problems.

General Education learning outcomes.

- Students will demonstrate knowledge of the analytical methods used within a specific mathematical field, and distinguish between effective and faulty reasoning.
- Students will formulate problems, obtain their solutions, and be familiar with modeling techniques required for successful application of mathematics to a variety of fields.

Course specific learning outcomes.

- Students will develop an understanding of multivariable function calculus and number and power series.
- Students will be able to differentiate and integrate multivariable functions and use multivariable calculus in problem solving.
- Students will develop an understanding of and proficiency in using mathematical software and appropriate technology.

Academic Integrity Statement: Saint Joseph's University encourages the free and open pursuit of knowledge; we consider this to be a fundamental principle and strength of a democratic people. To this end, SJU expects its students, its faculty, its administrators, and its staff to uphold the highest standards of academic integrity. The University expects all members of the University community to both honor and protect one another's individual and collective rights.

Students with Disabilities Statement: Reasonable academic accommodations may be provided to students who submit appropriate documentation of their disability. If students have need of assistance or questions with this issue, they are encouraged to contact the Office of Student Disability Services (SDS) at sds@sju.edu or by phone at 610.660.1774. The Office of SDS also provides an appeal/grievance procedure for complaints regarding requested or offered reasonable accommodations. More information can be found at: www.sju.edu/sds.

Health and Wellness Statement: Saint Joseph's University recognizes that physical and mental health strongly impact one's ability to do well in school and in life. As a result, there are many helpful campus resources designed to help students to care for their physical, mental, and spiritual health. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, mental health, alcohol or other drugs, identities, finances, etc. All of us benefit from support during times of struggle and challenges. If you are experiencing concerns, seeking assistance sooner rather than later is a courageous thing to do for yourself and those who care about you. The resources at https://sites.sju.edu/counseling/ can help you to cope with stress and to achieve your academic and personal goals.

Statement on AI use: The assignments in this course should be completed without any use of artificial intelligence platforms. Note that students will not have access to such platforms on in-class exams.