

SCUPI – Math0240 Calculus 3
Fall Semester, 2020

INSTRUCTOR: Zheng Yang **OFFICE:** Room 3-324A **EMAIL:** zhengyang2018@scu.edu.cn
TA: Lucy Sheng (2018141522005@stu.scu.edu.cn) **QQ group:** 1147879111
TA Recitation Hours: TBA
OFFICE HOURS: Monday through Friday 2 pm – 5 pm at Room 3-324A, Weekends by appointments

LECTURES: Monday 4:45 pm – 5:30 pm, 5:40 pm – 6:25 pm, Room 3-104
Thursday 4:45 pm – 5:30 pm, 5:40 pm – 6:25 pm, Room 3-104

CREDITS: 4 credit hours

REQUIRED TEXTBOOK: *Briggs, Cochran, Lyle: Calculus, Early Transcendentals 2nd ed.*

DESCRIPTION: This is the third in a sequence of three calculus courses for science and Engineering students in SCUPI. **We cover most of Chapters 11, 12, 13 and 14.** The goal is to prepare you to make use of calculus as a practical problem-solving tool.

COURSE OBJECTIVES: We motivate the essential ideas of calculus and demonstrate the utility of calculus with applications in diverse fields. We introduce each topic through many examples, applications and analogies, appealing to students' intuition and geometric instincts to make calculus natural and believable. We present generalizations and abstractions after the intuitive foundation is established.

LEARNING OUTCOMES FOR THIS COURSE:

- 1) Students will learn about functions of two or more variables.
- 2) Students will learn how to sketch simple surfaces.
- 3) Students will learn partial derivatives and find maxima and minima points.
- 4) Students will learn about scalar and vector fields and how physical quantities can be represented by such fields.
- 5) Students will be able to evaluate various derivatives (gradient, divergence, curl) for given fields.
- 6) Students will learn how to integrate functions involving vectors.
- 7) Students will be able to evaluate line integrals, surface and volume integrals where a function involving vectors is summed over a surface or volume.
- 8) Students will learn about some theorems relating to line, surface or volume integrals viz Stokes' theorem, Gauss' divergence theorem and Green's theorem.
- 9) Students will learn to integrate a function of two variables over various rectangular and non-rectangular areas, a function of three variables over a volume, and for various other coordinate systems.

GRADE: The final grade will be based on the **score**. The score is a number determined by

Homework: 15% Quizzes: 15% Presentation: 10% Exams: 40% Final Exam: 20%

The final letter grade is determined from the following table.

A: 90 – 100	A–: 85 – 89	B+: 80 – 84	B: 76 – 79	B–: 73 – 75	
C+: 70 – 72	C: 66 – 69	C–: 63 – 65	D+: 61 – 62	D: 60	F: < 60

HOMEWORK: There will be a suggested homework assignment given on each section covered. You should prepare a thick notebook for doing the homework problems. I recommend you **work through all Examples and their associated exercises in Basic Skills of the book**. Make sure you provide detailed steps for each problem that you attempt. The homework will be graded for the selected problems based on your honest efforts. You will meet with TA to go over problems related to the material covered in the previous lectures.

QUIZZES: There will be many quizzes given on some lecture days and recitations. I may also collect your solved exercises as quiz problems. Quiz and exam problems will be modeled on the homework problems.

EXAMS: There are two 120 minutes, closed book/notes, major tests and a final exam. Tentative Dates are given in the table below. Each major test will be cumulative with more emphasis on the material since the previous test. The final exam will be comprehensive. **There is NO Make up for all quizzes and exams.** Tentative exam dates are the following:

TEST 1: after Chapter 12	TEST 2: after Chapter 13	FINAL: during 1/2/2021 ~ 1/8/2021
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ORAL PRESENTATION GRADE: You are asked to work as a group of 4-5 students for a final project. The detailed instructions and deadlines of the project will follow up. The project will be graded based on a PPT presentation and your overall efforts. Presentation grade is determined by our (TA and me) evaluation score.

ATTENDANCE: You are expected to attend all the classes. A student who misses a class is responsible for finding out what was covered in the class. Note that you will also miss more “unexpected” points for being absent since I will likely provide a quiz or collect homework during your absence. **Remember there are no make ups for all grades related activities.**

CLASSROOM RULES: Electronic devices including but not limited to iphone, smartphone, ipod, ipad, pc are NOT allowed, except for course work.

CODE OF ACADEMIC CONDUCT: All students in attendance at the SiChuan University are expected to be honorable and to observe standards of conduct appropriate to a community of scholars. The University expects from its students a higher standard of conduct than the minimum required to avoid discipline. Academic misconduct includes all acts of dishonesty in any academically related matter and any knowing or intentional help or attempt to help, or conspiracy to help, another student. The Academic Misconduct Disciplinary Policy will be followed in the event of academic misconduct.

NON-ACADEMIC MISCONDUCT: All cell phones and other electronic devices are to be turned off and out of sight while you are in the classroom. All newspapers and other materials not related to the class are to be put away once class begins. Operating these devices and reading unrelated materials while in class is disrespectful of your instructor and fellow classmates. If you fail to abide by this rule, the instructor has the right to confiscate the device or materials. If you have an emergency and need to have your phone turned on during class, ask your instructor for permission

MATERIAL COVERED: Tentative sequence of the sections covered in this class is:

Week	Contents	Descriptions
#1	12.1 - 12.3 (11.3 – 11.4)	Planes and surfaces, limits and continuity (Dot products, Cross Products)
#2	12.4	Partial derivatives
#3	12.5, 12.6	Chain Rule, Directional derivatives, Gradient
#4	11.5, 11.6, 12.7	Vector functions and Space curves, Derivatives and Integrals of Vector functions Tangent planes and linear approximation
#5	12.7	Tangent planes and linear approximation
#6	12.8 - 12.9	Maximum/Minimum problems, Lagrange multipliers
#7	14.1, 11.8 14.2 (10.1)	Vector fields, length of curves Line integrals, Parametric equations
#8	14.2	Line integrals
#9	14.3, 13.1	conservative vector fields, Double integrals I

#10	13.1 – 13.2	Double integrals II
#11	13.2 – 13.3	Double integrals III,
#12	13.3, 10.2 – 10.3	Double integrals IV, Polar curves
#13	13.3, 14.4	Double integrals IV, Green's Theorem, Exam 1 (Ch.12, Ch 11.3 – 11.6)
#14	14.4, 13.4	Green's Theorem, Triple integrals
#15	13.5	Triple Integrals in Cylindrical and Spherical Coordinates
#16	14.6	Surface integrals
#17	14.6, 14.5	Surface integrals, Divergence and Curl Exam 2 (Ch 10.1 – 10.3, Ch 11.8, Ch 13.1 – 13.5, Ch 14.1 – 14.4)
#18	14.7, 14.8	Stokes' Theorem, Divergence Theorem
#19		Project Presentations
#20		Final Exam

Project dates and assignments

Due dates (on Blackboard)	Assignments
<i>6/8, Monday, by 11 pm</i>	Abstract Include: Title, group members (names and student ID), short descriptions of your project
<i>6/22, Monday, by 11 pm</i>	PPT slides Complete and edited version of your talk
<i>6/28, Sunday, by 11 pm</i>	Supplemental material Include anything (resource, data, images, computations, etc) that are not fully presented/explained in the PPT but you used in your project
<i>6/29, Monday 8:15 am – 9:55 am</i> <i>7/2, Thursday 8:15 pm – 9:55 pm</i>	Oral presentation <i>(15 minutes + 5 minutes Q&A)</i>

Suggested Format of Homework:

1. First line (bold) must be the assignment number and due date
2. Second line (bold) must be your class section, your name (in English and Chinese) and student ID number
3. You must state clearly every homework question.

Calculus 3

Homework #1

9/7/2020

Section: 2019 (ME/MSE/IE)

Name: George Green (格林)

ID#201931012345

1. Find the volume of ...