

# MATH 0230: Analytic Geometry and Calculus 2

Spring, 2023-2024

**Classroom:** Room 3-104 SCUPI Building

**Lectures:** Tuesday 8:15-9:00 am, 9:10-9:55 am & Thursday 10:15-11:00 am, 11:10-11:55 am.

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**Instructor:** Kunpeng Wang

**E-mail:** kunpeng.wang@scupi.cn

**Office hours:** Tues./Wed. 10-11 am, Tues./Thurs. 1-4 pm, Wed. 1-2 pm.

**Office:** Room 3-317A SCUPI Building

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**Teaching Assistants:** Ciliang Shao

**QQ Group:** 345433740

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**Tutorials:** TBA

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## Course Description

This is the second part of three-part calculus sequence for students in SCUPI. Topics mainly focus on single variable calculus which include integral calculus, applications of integration, integration techniques, improper integrals, infinite series, and parametric equations, polar curves and geometry of space.

## Prerequisites

MATH 0220 Analytic Geometry and Calculus 1

## Course Objectives

We will cover most of the material from Chapters 6-9 & part of Chapter 10 in the textbook.

## Learning Outcomes

At the completion of this course, students will be able to:

1. Understand the significance and various methods of integrals.
2. Utilize parametric representations of plane curves.
3. Compute areas and arc lengths associated with general parametric curves and specifically for curves defined by both cartesian and polar coordinates.
4. Comprehend the significance of sequences, series and their associated convergence behaviour.
5. Understand power series as well as the extent to which functions can be represented by Taylor/MacLaurin series.

## Class Structure

Lectures.

## Tutorials

Tutorials run by our TA will start in Week 03.

## Course Materials

**Textbook:** Essential Calculus, 2nd Edition, International Metric Edition, by James Stewart.

## Blackboard

Please regularly log on and check <https://learn.scupi.cn/>. We will upload there lecture notes, assignments, announcements and your grades.

## Course Assessment

Weekly assignments, quizzes, class activities, attendance, tests and final exams.

## Schedule of Exams, Assignments and Quizzes

### Exams

Date	Time	Component
Week 8	2 hours	Test 1
Week 13	2 hours	Test 2
Final exam week (June 24 to July 7)	2 hours	Final exam

### Assignments

Homework assignments will be given out weekly. They will be due by the following week on Tuesday at the beginning of the class at 8:15 am. Plagiarism will not be tolerated. However, discussions of the assignment problems will be permitted. Please also note each student must submit his/her individual assignment.

### Quizzes

Students will be asked to complete a quiz in tutorials each week. Normally, a quiz will consist of a short question.

## Grading Policy

The final grade will be computed according to the following scheme:

**Scheme:** Total grade = 15 % Assignments + 20 % Test 1 + 20 % Test 2 + 30 % Final Exam + 10 % Quizzes + 5 % Attendance.

**Note:** All tests and final exam will be closed-book.

## Conversion of Numerical Grades to Final Letter Grades Follows the SCUPI Common Grade

A [90,100]   A- [85,90)   B+ [80,85)   B [76,80)   B- [73,76)   C+ [70,73)   C [66,70)  
C- [63,66)   D+ [61,63)   D [60,61)   F (60,0)

### Schedule and weekly learning goals

The schedule is tentative and subject to change. The listed objects below should be viewed as the key concepts you should grasp after each week, and also as a study guide before each exam, and at the end of the semester. Each test will base on material that was taught up until the second last week prior to the test, namely, Test 1 covers Weeks 01-06, Test 2 is based on Weeks 07-11. The final exam will cover all topics taught in this semester.

#### Week 01, 02/26-03/01

- Cover Sections 6.1-6.2.
- Course introduction.
- Integration by parts.
- Trigonometric integral and substitutions.

#### Week 02, 03/04-03/08

- Cover Sections 6.2-6.3.
- Trigonometric Integral and Substitutions.
- Partial Fractions

#### Week 03, 03/11-03/15

- Cover Section 6.6.
- Improper integrals.

#### Week 04, 03/18-03/22

- Cover Sections 7.1-7.2.
- Areas between Curves.
- Volumes.

**Week 05, 03/25-03/29**

- Cover Sections 7.3-7.4.
- Volumes by cylindrical shells.
- Arc Length.

**Week 06, 04/01-04/05**

- Cover Sections 7.5.
- Area of a Surface of Revolution.
- **Tomb Sweeping Day.**

**Week 07, 04/08-04/12**

- Cover Sections 7.6-7.7.
- Applications to Physics and Engineering.
- Differential Equations.

**Week 08, 04/15-04/19**

- **Test 1.**
- Cover Section 8.1-8.2.
- Sequences.
- Series.

**Week 09, 04/22-04/26**

- Cover Sections 8.3-8.4.
- Integral and comparison tests.
- Other convergence tests.

**Week 10, 04/28-04/30**

- Cover Sections 8.4-8.5.
- Other convergence tests.
- Power series.

**Week 11, 05/06-05/10**

- Cover Section 8.6.

- Representing functions as power series.

**Week 12, 05/13-05/17**

- Cover Section 8.7.
- Taylor & Maclaurin Series.

**Week 13, 05/20-05/24**

- **Test 2.**
- Cover Sections 9.1-9.2.
- Parametric curves.
- Calculus with parametric curves.

**Week 14, 05/27-05/31**

- Cover Sections 9.3-9.4.
- Polar Coordinates.
- Areas and lengths in polar coordinates.

**Week 15, 06/03-06/07**

- Cover Sections 10.6-10.7.
- Cylinders and quadratic surfaces.
- Vector functions and space curves.

**Week 16, 06/10-06/14**

- Cover Section 10.8.
- Arc length and curvature.

**Week 17, 06/12-06/16**

- Cover Section 10.9.
- Motion in space and acceleration.

**Weeks 18 & 19, 06/19-06/30 Final Exam Week**

## Course Policies

**There will be no special treatments for any students in this course!** For example, if you have a heavy course load, you should expect a steep learning curve and be prepared for it. You will not be exempted from any assignments.

### During Class

Computers may be allowed in class for the electronic recording of notes. But please refrain from using computers for any activities that are unrelated to the course. Phones are prohibited as they are rarely useful for anything in the course. Eating and drinking are allowed in class but please keep from it affecting the course.

### Attendance Policy

Attendance is expected in all lectures. Valid excuses for absence will be accepted before class. In extenuating circumstances, valid excuses with proof will be accepted after class. Perfect attendance can be given a full mark in attendance. **SCU has announced a very strict policy on class attendance. Consecutive absences for 3 weeks may lead you to an F in this class.**

### Policies on Late Assignments and Exams

Students should start their homework assignments immediately after the assignments are given, and DO NOT wait until the last minute to meet the deadlines. **Late assignments will be NOT accepted except for emergencies and health issues. Any other late assignments handed in will be marked but will be given 0.** At most **Two** extensions for assignments will be given in this course. All assignments will be counted in your total grade. **Late submission for previous assignments during the final exam period will NOT be accepted in any form for any excuses.**

All tests and the final exam are mandatory. There will be absolutely no makeup exam for each test. If you miss the final, a makeup exam may be given for the final exam if the student has the approval from the instructor or emergencies and health issues **with a valid proof**. I will not accept the student deceleration for absence form for the final exam.

### Academic Integrity

At Sichuan University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do.

Everyone at SCUPI is expected to treat others with dignity and respect. The Code of Student Conduct allows Sichuan University to take disciplinary action if students don't follow this community expectation.