



Minzu University of China

MATH 230 Calculus II

Summer 2020

Basic Information

Class hours: Monday through Thursday, 2 hours each day

Discussion: Friday, 1 hour (60 minutes)

Review Section: Saturday, 1 hour (60 minutes)

Office Hour: 2 hours (According to professors' teaching plan)

Field trip: China Science & Technology Museum, Beijing

Credit: 4

Total contact hours: 60 (50 minutes each)

Instructor: Mingshen Wu

Course Description and objectives

This course will start with exploring advanced applications of integration including finding volumes of objects that may be created by rotating a curve around a line or other shapes – using disc and shell methods. Then we will study further integration techniques including integration by parts, trigonometric integration and substitution, integration using partial fractions, and improper integration. We will study functions in parametric forms, conic sections in both Cartesian and polar coordinates. Finally, we will explore the properties and convergence of infinite sequences and series and introduce McLaurin and Taylor series.

Objectives

Through taking this course students will

- (i) develop deeper understanding of integration and its importance applications
- (ii) learn about series, including their convergence properties and their use in representing functions – Taylor and McLaurin series
- (iii) learn mathematically representing conic sections in polar coordinates
- (iv) gain an appreciation for the importance of calculus in mathematics, computer science, and engineering applications

Textbook

Calculus Early Transcendentals, 7th Edition, by James Stewart

Prerequisites

Calculus I

Course Outline and Schedule

Week 1	<ul style="list-style-type: none">● Review limit, differentiation, and integration basics from calculus I● Volumes by disc method and cylindrical shells● Work and average value of a function● Integration by parts, trigonometric integration
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Week 2	<ul style="list-style-type: none"> ● Trigonometric substitution ● Integration of rational functions by partial fractions ● Improper integrals ● Arc length, area of a surface of revolution ● Curves defined by parametric equations ● Calculus with parametric curves
Week 3	<ul style="list-style-type: none"> ● Polar coordinates, areas and lengths in polar coordinates ● Conic sections – geometry feature, equations in Cartesian coordinates and polar coordinates (midterm) ● Sequences and convergence
Week 4	<ul style="list-style-type: none"> ● The integral test and estimates of sums ● Comparison tests and Alternating series ● Absolute convergence and the ratio and root tests ● Power series ● <i>Field Trip: visiting China Science and Technology museum</i>
Week 5	<ul style="list-style-type: none"> ● Representations of functions as power series ● Taylor and Maclaurin series ● Application of Taylor polynomial in numerical analysis and computer science <p>(Review and final exam)</p>

Field Trip (FT)

Since people had counting numbers mathematics has been developed together with human evolution. The real-world practices challenge mathematicians to do deeper and advanced research. To the contrary, the development of mathematics allows human being to know the universe better and deeper. Mathematics has been applied to all science branched and our daily life. This course will arrange one class meeting time to visit **China Science & Technology Museum** (located at 北京市朝阳区北辰东路5号). Through this activity hope students will elevate the appreciation of mathematics and motivation of learning math well. Students will be requested to write an essay of this experience and share at the discussion time. This activity is of 5% overall credit.

Grading Policy

Instructor will assign homework. Course Teaching Assistant (TA) will lead a discussion section on Friday every week. You are highly encouraged to discuss the homework problems with each other. This is an efficient way of learning.

Tests: There will be two quizzes (that will be give during week two and week four), a midterm (week three) and a final exam.

Credit distribution: Attendance 5%; FT 5%; Quizzes 30%; Midterm 30%; Final exam 30% Grading scale: Letter grades will be assigned by the following percentages:

97-100	A+	87-89	B+	77-79	C+	67-69	D+	Below 60	F
94-96	A	84-86	B	74-76	C	64-66	D		
90-93	A-	80-83	B-	70-73	C-	60-63	D-		



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Exam Policy

No make-ups for missed quiz/exams by any reason. For legitimate absences, the quiz/exam may be excused. Instructor will consider replacing it by presenting homework.

Attendance Policy

Attending all class meetings is required. Missing one (unexcused) class meeting day may be still considered as a good attendance. Attendance is of 5% of overall course credit. Missing one additional day would reduce 2.5%, so if a student missing three or more unexcused class meeting days the student will NOT receive attendance credit. Missing more than half of an hour (late come or early leave) may be considered as an absence. Students are responsible for missed course work by any reason. Summer sessions move fast! Be ready to work hard to achieve your goal.

Academic Integrity

Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors. Students who violate these standards must be confronted and must accept the consequences of their actions.

If a solid proof of cheating/plagiarism found, the student may fail the course or disqualified from the class.

Disability Help

Please let me know as soon as possible if anyone who has a disability which may require some modification of seating, testing or other class requirements so that appropriate arrangements may be made.

Expectations on Students' Learning and Behaving

- You should come to classroom on time, and have a note book, a scientific calculator with you.
- You should shut down or mute your cellphone while entering the classroom and keep it out of your sight.
- Your motivation is the key to learn well. Be concentrated in classroom.
- You are encouraged to ask or answer question(s) in classroom, if any.
- Practice shows that classroom discussion is an efficient and effective way of learning. You are encouraged to join a group work in classroom, sharing ideas and contribute to a team work. Instructor will assign classroom practical problems solving activities time to time, so be sure to follow instruction to do "hands on and minds on" work on these practices.
- Instructor may have some challenging questions to motivate students thinking and reasoning. You are encouraged to make a classroom presentation, if there is a chance to do so. Correctly or productively presenting a challenge question in the classroom may be awarded extra credit.
- Understanding is everything! To Study well, you must pay attention to instructor's explanation. For each example shown in classroom, the instructor intends to show you the problem-solving process, a logical idea, or a special case study to you. You should take notes and review after class to make sure you understand and be able to solve the problems again independently.
- By any reason, if you miss a class, you should copy notes from a classmate. While catching up, you may see the solution of an "example". Take a minute to think about how you would solve each problem before reading the solution. Asking for help if needed in or out of classroom.
- Absolutely no cheating! Cheating is indeed to cheat yourself. You lose the opportunity of logical thinking and logical reasoning if you steal an answer from someone else. Cheating may stain your personal character. Cheating may be punished and may ruin your future career!
- Working hard! You should have a clear goal: Coming to the summer school you are willing to learn the knowledge that is required by your academic program and/or your study plan. Do your best to learn well while enjoying yourself. Best wishes!