

# Math 126 - Calculus II

4 units, Fall 2016, MWF 11:00-11:50 in SGM 601

## Contact information

- **Instructor:** Christian Zillinger
  - **Office hours:** W 1pm-3pm, F 1pm-2pm and by appointment
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- **Teaching Assistant:** Fei Wang
  - **Consulting hours:** Tu 11-12, W 3-4, Th 12-1
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- **Grader:** Gokul Vutukuri
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## Course description

We will cover applications of integration, indeterminate forms and useful techniques for their computation. Furthermore we will study Taylor series and power series, the approximation of integrals, trigonometric functions and polar coordinates.

**Prerequisite:** Math 125 Calculus I

## Learning objectives

A particular focus will be on getting accustomed to and fluent in various techniques of integration and summation and working with exponential, logarithmic and inverse trigonometric functions. Students will learn about

- Applications of integrals in mathematics and (natural) sciences, e.g. computing volumes, (physical) work, areas, concentrations of solutions, areas and arc lengths,
- Common Techniques of integration and their efficient use: Substitution, integration by parts, partial fractions, expansions in terms of sums

- Indeterminate forms and L'Hospital's rule
- Approximation of functions by their Taylor series
- Relating integrals and series, numerical approximation and error estimates.

Students will improve their problem solving skill and learn how to apply integration to analyse problems as well as how to quickly and efficiently compute or approximate integrals.

## Blackboard

Materials such as **homework assignments** or **grades** will be posted on blackboard, <http://blackboard.usc.edu> . You are required to **check blackboard regularly**.

## Technological Proficiency and Hardware/Software Required

There will be two lab exercises to be completed using Mathematica. The Math Center offers resources on Mathematica, <https://dornsife.usc.edu/mathcenter/mathematica/> .

## Required reading

Essential Calculus (2nd Edition) by James Stewart.

## Description and Assessment of Assignments

There are weekly **homework** sets to be handed in by the students. Additionally, there will be weekly **quizzes** at the end of every Tuesday's discussion sessions. Students will be asked to complete two **lab** exercises.

Discussion and collaboration is strongly encouraged, but only individual, independent submissions will be accepted.

**Three midterms** will be administered in-class on Wednesday **September 14, October 14** and **November 9**.

This lecture has a **common final exam** on **December 7** at 2pm-4pm, which is an **exception to the final exam schedule**, see <https://classes.usc.edu/term-20163/finals/> .

## Grading breakdown

Assignment	% of Grade
Homework	15%
Quizzes	5%
Labs	5%
Midterm I	15%
Midterm II	15%
Midterm III	15%
Final Exam	30%
<b>Total</b>	<b>100%</b>

## Assignment Submission Policy

Problem sets will be available on Blackboard every Wednesday and are due in discussions on the following Tuesday. Quizzes will take place in the discussions on Tuesdays.

## Additional Policies

In the interest of fairness to all students, there will be no make-up exams or quizzes and late homework will not be accepted without prior approval by the instructor. In case of scheduling conflicts or emergencies, you should contact me as early as possible (at least two weeks).

In exams **no calculators** or other technical tools (smartphones etc) will be allowed.

## Getting help

If you have any feedback, problems, questions or want to chat, please do not hesitate to drop by at my office. Learning mathematics requires active practice and it can be very difficult to catch up again, so I encourage you to come by already early in the semester.

The Math Center, <http://dornsife.usc.edu/mathcenter>, is located in KAP 263 and is intended to give students a place to work on homework and get help from graduate students. During the Spring and Fall semesters, the Math Center is open Monday to Thursday 8am to 7pm and Friday 8am to 5pm. The TA's consulting hours will take place in the math center.

Additionally, Supplemental Instructions, <https://dornsife.usc.edu/math126/>, are open to all students. There experienced undergrad students lead study sessions to help you learn and review.

## Course Schedule: Weekly breakdown

The exact scheduling of topics and readings are tentative and are subject to change depending on progress in the lecture. Quizzes will be taking place on Tuesdays in discussions, but not during midterm weeks.

Week	Topics	Chapters	Assignment (due)
1	Integration and FTC	4.2, 4.4	Homework 1 (8/30)
2	Inverse trig. functions	5.1, 5.6, 5.7	Homework 2 (9/6)
3	Techniques of integration	4.5, 6.1, 6.2	Homework 3 (9/13)
4	Review, Techniques of integration	6.4, 6.5	Midterm I (9/14)
5	Approximation of integrals	6.3, 6.4, 6.5	Homework 4 (9/27)
6	Areas and Volumes	7.1, 7.2	Lab I (10/4)
7	Applications of integrals	7.6	Homework 5 (10/11)
8	Indeterminate forms, L'Hospital	5.8, 6.6	Midterm II (10/14)
9	Series and power series	8.1-8.4	Homework 6 (10/25)
10	Taylor series and integrals	8.5-8.8	Homework 7 (11/1)
11	Polar coordinates	9.2, 9.3	Lab II (11/8)
11	Differential Equations and parametric equations	7.7, 9.1	Midterm III (11/9)
13	Arc length and surfaces of revolution	7.4, 7.5	Homework 9 (11/22)
14	Areas, lengths in polar coordinates	7.3, 9.4, 9.5	Homework 10 (11/29)
15	Review	-	-
Final	Final Exam		Final Exam (12/7)

## Statement on Academic Conduct and Support Systems

### Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards, <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions>. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity <http://equity.usc.edu> or to the Department of Public Safety <http://adminopsnet.usc.edu/department/department-public-safety>. This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage <http://sarc.usc.edu> describes reporting options and other resources.

### Support Systems

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose

primary language is not English should check with the American Language Institute <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. The Office of Disability Services and Programs [http://sait.usc.edu/academicsupport/centerprograms/dsp/home\\_index.html](http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html) provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, USC Emergency Information <http://emergency.usc.edu> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.