

MATH 109, CALCULUS II (FOR SCIENCE AND ENGINEERING), SUMMER 2018

SYLLABUS

1. COURSE INFORMATION

Instructors: Daniel Fuentes-Keuthan and Xudong Zheng

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Graders: Lili He and Rong Tang

Email: lhe31@math.jhu.edu, rtang18@math.jhu.edu

Office Hours: Online, by appointment

Lecture: 75 - 90 minutes, Monday through Thursday

Textbook: *Single Variable Calculus: Early Transcendentals*, 8th Ed. James Stewart

Grading scheme:

- Homework: 30 %
- Midterm exams: 15 % each
- Final Exam: 40 %

Homework: Homework problems will be chosen from the textbook and assigned every 2 days: at the end of lessons on Tuesdays and Thursdays. You are expected to scan and submit your homework to the TA, Lili He or Rong Tang. Homework assigned on Tuesdays is due before the end of Friday; homework assigned on Thursdays is due by the end of Monday. Late homework will be accepted only with an exceptionally good excuse. Points will be deducted for any late homeworks.

Exams: There will be 2 mid-term exams. The first exam will be sent on July 5 to proctors and will need to be returned no later than July 8. The second exam will be sent to proctors on July 19th and will need to be returned no later than July 22. There will be a cumulative final exam emailed to proctors on Thursday August 2 to be returned by August 5th. Late exams will be deducted 10 points per day. After one day, the grade is a zero with no retakes.

2. COURSE OBJECTIVES

The goal of MATH 109 is to continue the study of calculus on the real line, which you started in Calculus I, with a focus on integration, the basics of differential equations, as well as sequences and series.

Calculus is a beautiful and venerable subject, whose main aim is to understand the properties of functions, and how they can be used to describe and predict the behavior of various physical systems. The prominence and importance of such study reaches far beyond the pure mathematical endeavor into numerous applications, among others in engineering, natural sciences, and economics.

Students enter MATH 109 from a variety of backgrounds. Regardless of your background coming in, our goal is to help every one of you succeed, and enjoy yourselves as much as possible in the process!

However, calculus is often a subtle and challenging subject, and experience has taught us (both as students once ourselves, and as educators) that success in MATH 109 requires a lot of work, many hours of study and problem solving, and your active involvement in learning, both inside and outside the classroom. We have designed our course with the aim of helping you stay constantly involved with the course and the

material, and within easy reach of some of your best resources: your instructor, your teaching assistants, and your colleagues! Working (quite hard!) together, you will find that at the end of the semester you have not only learned the basics of the course, but mastered the concepts, their connections, and many of their possible applications!

3. SCHEDULE

The course runs from Monday June 11 until Sunday August 5, and it covers chapters 7, 9-11 in the textbook.

Week	Topics	Notes
Week 1	No class	
Week 2	Integration by parts, Trigonometric integrals, Trigonometric substitution, Partial fraction integration	
Week 3	Modeling with Differential Equations, Direction Fields, Separable Equations, Models for Population Growth, Linear Equations	
Week 4	Curves Defined by Parametric Equations, Calculus of parametric Curves, Polar Coordinates, Areas and Lengths in Polar Coordinates	Mid-term 1
Week 5	Improper Integrals, Sequences, Series	
Week 6	The Integral test and Estimates of Sums, The Comparison Tests, Alternating Series, Absolute Convergence and the Ratio and Root Tests	Mid-term 2
Week 7	Strategies for Testing Series, Power Series, Representing Function as Power Series, Taylor and Maclaurin Series	
Week 8	Applications of Taylor and Maclaurin Series, Final review	Final exam

4. STUDENTS WITH DISABILITIES

Students with documented disabilities or other special needs who require accommodation must register with Student Disability Services. After that, remind the instructor of the specific needs at two weeks prior to each exam; the instructor must be provided with the official letter stating all the needs from Student Disability Services. For more information:

<http://web.jhu.edu/disabilities>

5. JHU ETHICS STATEMENT

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition.

Report any violations you witness to the instructor. You may consult the associate dean of students and/or the chairman of the Ethics Board beforehand. Read the "Statement on Ethics" at the Ethics Board website for more information.