

Math 262, Calculus with Theory II, Winter 2020

Class Time: MTuWTh 3-3:50p.m. in 253 Straub Hall
Instructor: Dr. Marcin Bownik
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Office Hours: 2-3p.m. Mon., 11a.m.-12p.m. Wed., and 2-3p.m. Thu., or by appointment
Textbook: M. Spivak *Calculus*, 4th ed.

- 1. Course outline.** This course introduces students to differential calculus from the theoretical point of view, how calculus works as well as how to use it. Topics include derivatives, integrals, fundamental theorem of calculus, and rigorous study of trigonometric, logarithmic, and exponential functions. An ability to read, understand, and write proofs will be stressed. A precise knowledge of concepts and definitions is essential. The course, which is the first of three in the sequence, covers most of the chapters 11–15 and 18–19 of Spivak.
- 2. Learning Outcomes.** Students should be able to solve problems by providing clear and logical steps such as:
 - find local maxima and minima of functions,
 - find limits of functions using L'Hôpital Rule,
 - find intervals of convexity and concavity, and points of inflection,
 - compute inverse functions and their derivatives,
 - prove properties of Riemann integrable functions,
 - compute integrals using Riemann sums,
 - apply the Fundamental Theorem of Calculus in integral computations,
 - show properties of trigonometric and inverse trigonometric functions from definition,
 - show properties of logarithmic and exponential functions from definition, and
 - compute integrals by integration by parts and substitution formula.
- 3. Exams.** There will be two midterm in-class exams on Wed. 1/29, and Wed. 2/19 and a final exam on Tue. 3/17, 2:45–4:45p.m.
- 4. Discussions.** In addition to 3 weekly lectures on MWF, there is a discussion class on Tuesday.
- 5. Homework.** Homework problems will be assigned every week and be due in class on Wednesday on the material of the previous week. No late homework will be accepted. In general, students may find homework problems in this course to be difficult and challenging. You should expect to spend a long time to do some of the problems. This is perfectly normal and expected. Hard work and practice with homework problems are essential in succeeding in this course.
- 6. Grading.** The grading distribution will be as follows:

Homework:	20%
Each of the Midterm Exams:	20%
Final Exam:	40%