

Math 115 – Calculus of Functions of One Variable II

Yale Summer Session B 2017

Course Description

Calculus is the study of change. In Math 115 we focus on the integration aspect of calculus, namely how to sum up infinitesimal changes to produce the total change. The three main topics in this course are integration, infinite sequences and series, and differential equations. We will study theorems on these topics as well as develop techniques for solving problems in geometry, economics, biology, and physics.

Textbook

Calculus, Early Transcendentals, 8th edition by James Stewart. The Yale Bookstore prints a special version for Math 115, which should be the cheapest way to purchase the textbook for this course.

Homework

We will assign problem sets that are typically due before classes on Monday, Wednesday, and Friday of each week. Each problem will be graded on a 0 to 3 points scale depending on the accuracy and clarity of your work. Calculators are allowed and sometimes necessary for the homework problems. You are encouraged to form study groups and work collaboratively; however, each person must submit his/her own problem set with collaborators' name written. No late homework will be accepted unless extension is granted.

Exams

There will be one in-class midterm exam on Wednesday, July 19th and one in-class final exam on Friday, August 4th. No calculators are allowed on these two exams.

Resources

I will host office hours from 5 to 7 on Tuesdays and Thursdays at the math lounge (DL 432). You may also contact me via email to set up appointments outside of regular office hours.

There are supplementary videos on canvas on the topics covered in class. They can be found in the videos folder under the Media Library tab.

Grading

There are three contributing factors towards your final grade in this course: homework, the midterm exam, and the final exam. We will first convert the numerical score into percentage of the total amount of available points in each of the three factors, and then compute their weighted average according to the following formula

$$20\% \text{ Homework} + 35\% \text{ Midterm} + 45\% \text{ Final}$$

The outcome will then be converted into letter grades according to the following scale:

Outcome	90 – 100	80 – 90	65 – 80	50 – 65	<50
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Grade	A-/A	B-/B/B+	C-/C/C+	D	F
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Course Schedule

Date	Topic	Section(s)	P-set (due before next class)
7/3	Riemann sums and the fundamental theorem	5.1 – 5.3	5.3: 2, 8, 30, 62, 74
7/4	Substitution and area between curves	5.5 & 6.1	5.4: 2, 32, 50, 64 5.5: 14, 32
7/5	Volumes	6.2 & 6.3	5.5: 38, 60, 88 6.1: 2, 20, 22, 50 6.2: 4, 16, 22, 58
7/6	Integration by parts and strategies for integration	7.1 & 7.5	6.3: 8, 18, 20
7/7	Arc length	8.1	7.1: 4, 10, 26, 40 7.5: 6, 22, 24, 64, 66 8.1: 12, 20
7/10	Integral approximation	7.7	7.7: 4, 8, 22, 46
7/11	Improper integrals and p-test	7.8	7.8: 2
7/12	Comparison test	7.8	7.8: 24, 34, 52, 80
7/13	Sequences	11.1	11.1: 14, 32
7/14	Series	11.2	11.1: 36, 38, 48 11.2: 18, 30, 32, 40, 68
7/17	Integral test *	11.3	11.3: 8, 26, 30
7/18	Comparison test	11.4	11.4: 10, 24, 28
7/19	Midterm exam		
7/20	Alternating series	11.5	
7/21	Ratio test	11.6	11.5: 4, 10, 24, 32 11.6: 10, 12, 20, 24, 26
7/24	Power series	11.8 & 11.9	11.8: 4, 16, 18, 30, 32, 42 11.9: 8, 18, 28, 40
7/25	Taylor series	11.10 & 11.11	
7/26	Parametric functions	10.1	11.10: 14, 24, 40, 54, 62, 74 11.11: 14, 26
7/27	Calculus on parametric functions and polar coordinates	10.2 & 10.3	10.3: 16, 24
7/28	Differential equations	9.1	10.3: 48, 54, 60 9.1: 4, 6, 10, 12, 14
7/31	Direction fields and Euler's method	9.2	9.2: 4, 6, 10, 18, 24, 28
8/1	Separable equations	9.3	9.3: 6, 12, 16, 30, 38, 48 9.4: 4, 18, 22
8/2	Modeling	9.4 – 9.6	9.6: 2, 6, 8, 10
8/3	Review		

8/4	Final exam		
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* Midterm covers topics up to (and including) this class.