Shanghai Jiao Tong University

MA081 Calculus II

Instructor Information:	Gexin Yu Home Institution: College of William and Mary Email: gyu@wm.edu Office Hours: Determined by Instructor

Term:	June 29, 2020 - July 24, 2020	**Credits:**	4 units

Class Hours：	Monday through Friday, 120 minutes per teaching day
Discussion Sessions:	2 hours each week, conducted by teaching assistant(s)
Total Contact Hours:	66 contact hours (1 contact hour = 45 mins, 3000 mins in total)
Required Texts (with ISBN):	Essential Calculus: Early Transcendentals, Enhanced Edition (kindle ebook), by James Stewart, ISBN-10: 0538497394; ISBN-13: 978-0538497398
Prerequisite:	Calculus 1

Course Overview

We will cover the following topics: area between curves, volumes (disk, washers, slicing), work, fluid force and pressure, substitution method of integration, integration by parts, trigonometric integrals, trigonometric substitution, partial fractions, numerical methods of integration, improper integrals, arc length, modeling with differential equations, sequences, series, various test for convergence of series, power series, and Taylor and Maclaurin series. Topics are presented with an emphasis on definitions and proofs as well as applications.

Course Goals

We will cover three parts in this course: evaluate integrals, applications of integrals, and series.
1. Evaluation of Integrals (Chapter 5.4, 5.5, 6.1--6.3, 6.5--6.6 from Steward's book): We cover Fundamental Theorem of Calculus, substitution rules and integral by parts, trig integration and substitution, partial fraction. We will cover approximation of integration and improper integrals;
2. Applications of Integrals (Chapter 7.1--7.6): We will talk about how to use integrals to find area between curves, volumes, and arc length, as well as the applications in physics and engineering. We will also talk about some simple differential equations;
3. Series (Chapter 8.1--8.7): We talk about series and different ways to test whether a series is convergent or not. We will also talk about power series and Taylor series.

Grading Policy

Quizzes and Homework	30%
Midterm Examination	30%
Final Examination	40%

Grading Scale

Number grade	Letter grade	GPA
90-100	A	4.0
85-89	A-	3.7
80-84	B+	3.3
75-79	B	3.0
70-74	B-	2.7
67-69	C+	2.3
65-66	C	2.0
62-64	C-	1.7
60-61	D	1.0
≤ 59	F (Failure)	0

Class Schedule

Date	Lecture	Readings
Day 1	Definition of integral and its computation	Chapter 5.3-5.4
Day 2	Substitution and Integration	Chapter 5.5
Day 3	Integration by parts	Chapter 6.1
Day 4	Trig integrals and trig substitution	Chapter 6.2
Day 5	Partial fraction decomposition	Chapter 6.3
Day 6	Approximate integrals and improper integrals	Chapter 6.5-6.6
Day 7	Area between curves and volume problems	Chapter 7.1-7.2
Day 8	Arc length, work of a force, and surface area	Chapter 7.3-7.5
Day 9	Midterm review	
Day 10	**Midterm Examination**	
Day 11	Hydrostatic force and centroid of a mass	Chapter 7.6
Day 12	Differential equations and sequence	Chapter 7.7
Day 13	Sequence	Chapter 8.1
Day 14	Seires	Chapter 8.2
Day 15	The integral and comparison tests	Chapter 8.3
Day 16	Test for convergency of series	Chapter 8.4
Day 17	Power series and its convergency	Chapter 8.5-8.6
Day 18	Tyler series and Maclaurin Series	Chapter 8.7
Day 19	Final Review	
Day 20	**The Final Examination**	