Shanghai Jiao Tong University

MATH 12 Calculus 2

Instructor:	Gexin Yu	**Email:**	gyu@wm.edu
Instructor's Home Institution:	College of William and Mary	**Office:**	TBD
Office Hours:	TBD		
Term:	July 15-August 9, 2019	**Credits:**	4 units
Classroom:	TBD	**Teaching Assistant(s):**	TBD
Class Hours:	Monday through Thursday, 120 mins 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.

Learning Outcomes / 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

Homework and quizze	30%
Midterm exam	30%
Final exam	40%

Grading Scale is as follows:

Number grade	Letter grade	GPA
90-100	A	4
85-89	A-	3.7
80-84	B+	3.3
75-79	B	3
70-74	B-	2.7
67-69	C+	2.3
65-66	C	2
62-64	C-	1.7
60-61	D	1
≤ 59	F (Failure)	0

Class Schedule (Subject to Change)

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

HOMEWORK ASSIGNMENT

All of the homework problems are from the textbook:

5.4:   1-27 (odd)

5.5:   1-49 odd,34,44

6.1: 1-29 odd, 26, 28, 34, 39, 41

6.2: 1-25 (odd), 35-61 (odd)

6.3: 1-9 odd, 19, 21, 23, 31, 32, 35, 37, 43

6.5: 1,7, 9, 18, 20, 25, 30, 31

6.6: 1, 3, 5, 9, 11, 21, 23, 41, 43, 49

7.1: 1, 3, 5, 6, 11, 21, 24, 26, 27, 28

7.2: 1, 2, 9, 10, 11, 12, 13, 15, 21, 23, 25, 27, 29, 41

7.4: 1, 3, 8, 9, 12, 13, 17, 25, 27, 29

7.5: 1-17 odd, 18, 23-30 all (29 a-c only)

7.6: 1- 17odd, 21-25, 27, 31, 33, 43, 44, 46

7.7:   1-14 (odd), 37, 43, 45.

8.1: 1-35 odd

8.2: 1-33 odd, 6

8.3: 1-31 odd, 14, 18, 24

8.4: 1-10, 13, 14, 16, 19-33 odd, 37, 39, 41

8.5: 1, 2, 3, 7, 9, 13, 17, 19

8.6: 1, 3, 6, 7, 17, 23, 27, 31, 37

8.7: 1, 4, 5, 7, 13, 17, 18, 29, 31, 37, 39, 43, 47