



## Shanghai Jiao Tong University

### MA081 Calculus II

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<b>Home Institution:</b>	Lehigh University	<b>Office:</b>	505 Main Bldg
<b>Office Hours:</b>	TBD		
<b>Term:</b>	28 May – 28 June, 2018	<b>Credits:</b>	4 units
<b>Classroom:</b>	TBD	<b>Teaching Assistant(s):</b>	TBD
<b>Class Hours:</b>	Monday through Thursday, 1:10 pm-3:10pm		
<b>Discussion Session:</b>	2 hours each week, led by teaching assistant(s)		
<b>Total Contact Hours:</b>	66 contact hours (1 contact hour = 45 mins, 3000 mins in total)		
<b>Required Texts (w/ ISBN):</b>	Essential Calculus: Early Transcendentals, Enhanced Edition (kindle ebook), by James Stewart, ISBN-10: 0538497394; ISBN-13: 978-0538497398.		
<b>Prerequisite:</b>	MA080 Calculus I		



## 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.

### Expanded Description

We will cover three main 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

Assessments	Proportions
Homework and quizzes	30%
Midterm exam	30%
Final exam	40%

## Grading Scale

Your letter grade will be assigned according the following 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

### Course Schedule

<b>WEEK 1 (28-31 May):</b>		
<b>Section</b>	<b>Topic</b>	<b>Homework (from textbook)</b>
	Review	
5.4	The Fundamental Theorem of Calculus	1-27 (odd)
5.5	The Substitution Rule	1-49 odd, 34, 44
6.1	Integration by Parts	1-29 odd, 26, 28, 34, 39, 41
6.2	Trigonometric Integrals and Substitutions	1-25 (odd), 35-61 (odd)
<b>WEEK 2 (4-7 June):</b>		
6.3	Partial Fractions	1-9 odd, 19, 21, 23, 31, 32, 35, 37, 43
6.5	Approximate Integration	1, 7, 9, 18, 20, 25, 30, 31
6.6	Improper Integrals	1, 3, 5, 9, 11, 21, 23, 41, 43, 49
7.1	Areas between Curves	1, 3, 5, 6, 11, 21, 24, 26, 27, 28
7.2	Volumes	1, 2, 9, 10, 11, 12, 13, 15, 21, 23, 25, 27, 29, 41
<b>WEEK 3 (11-14 June):</b>		
<b>Midterm exam</b> at the Beginning of the week (11 June 2018).		
7.3	Volumes by Cylindrical Shells	
7.4	Arc Length	1, 3, 8, 9, 12, 13, 17, 25, 27, 29
7.5	Applications to Physics and Engineering	1-17 odd, 18, 23-30 all (29 a-c only)
7.6	Differential Equations	1- 17odd, 21-25, 27, 31, 33, 43, 44, 46
<b>WEEK 4 (18-21 June):</b>		



8.1	Sequences	1-35 odd
8.2	Series	1-33 odd, 6
8.3	The Integral and Comparison Tests	1-31 odd, 14, 18, 24
8.4	Other Convergence Tests	1-10, 13, 14, 16, 19-33 odd, 37, 39, 41
<b>WEEK 5 (25-28 June):</b>		
8.5	Power Series	1, 2, 3, 7, 9, 13, 17, 19
8.6	Representing Functions as Power Series	1, 3, 6, 7, 17, 23, 27, 31, 37
8.7	Taylor and Maclaurin Series	1, 4, 5, 7, 13, 17, 18, 29, 31, 37, 39, 43, 47
<b>Final exam</b> at the end of the week (28 June 2018).		

### Academic Honesty

The highest standards of academic integrity are enforced for this course. You may (actually are encouraged to) work together on your homework problems, but you are allowed to get help on your quizzes or exams from your classmates or any other resources. Failure to abide the rule will result in a failing grade for your coursework.