

King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics
Math 102 - Term 162 - Syllabus
Coordinator: Dr. Ibrahim Al-Rasasi

Title	Calculus II
Credit	4-0-4
Textbook	Calculus: Early Transcendentals, 7 th Edition, Metric International Version, by James Stewart, Brooks/Cole (2012)
Description	Definite and indefinite integrals of functions of a single variable. Fundamental Theorem of Calculus. Techniques of integration. Applications of the definite integral to area, volume, arc length and surface of revolution. Improper integrals. Sequences and series: convergence tests, integral, comparison, ratio and root tests. Alternating series. Absolute and conditional convergence. Power series. Taylor and Maclaurin series.
Learning Outcomes	<p>Upon completion of this course, students should be able to understand:</p> <ol style="list-style-type: none"> 1. The concept of definite and indefinite integrals; 2. The concept of Fundamental theorem of calculus; 3. Various techniques of integrations; 4. The concept of finding area, arc length, surface and volume of solid of revolution; 5. Improper integrals and techniques to solve improper integrals; 6. Infinite sequence and series and different methods to check for convergence and divergence; 7. Representing a function as power series; 8. Taylor and Maclaurin series representation of functions.

Grading Policy	Exam I A common multiple choice exam	Material: 5.1 - 6.2	Place: Building 54	25% (100 points)
		Date: Wed. March 15	Time: 6:30-8:30 pm	
	Exam II A common multiple choice exam	Material: 6.3 – 7.8	Place: Building 54	25% (100 points)
		Date: Sunday, April 16	Time: 6:30-8:30	
	Final Exam A common comprehensive multiple choice exam	Material: Comprehensive	Place: Building 54	35% (140 points)
		Date: Monday, June 5	Time: 9:00-12:00 pm	
	Online Homework	The address for online homework is provided on Blackboard .		5% (20 points)
	Class Work	They are based on quizzes, class tests, or other class activities determined by the instructor. Any quiz or test under class activity should be of written type and not of multiple-choice type. The average \bar{x} (out of 40) of class activities of the sections taught by the same instructor must be in the intervals [28,30].		10% (40 points)

Exam Questions	The questions of the common exams are based on the examples, homework problems, recitation problems, and the exercises of the textbook.
Missing Exam I or Exam II	No makeup exam will be given under any circumstance. When a student misses Exam I or Exam II for a legitimate reason (such as medical emergencies), his grade for this exam will be determined based on the existing formula, which depends on his performance in the non-missed exam and in the final exam.
Attendance	Attendance is a University Requirement. A DN grade will be awarded to any student who accumulates 12 unexcused absences (lecture and recitation).
Academic Integrity	All KFUPM policies regarding ethics apply to this course.

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Pacing Schedule	Week	Date (2017)	Section	Topics (27 sections)
	1	Feb. 05-09	5.1	Areas and Distances
			5.2 ⁽¹⁾	The Definite Integral
	2	Feb. 12-16	5.2	The Definite Integral
			5.3	The Fundamental Theorem of Calculus
	3	Feb. 19-23	5.4	Indefinite Integrals and the Net Change Theorem
			5.5	The Substitution Rule
	4	Feb. 26- March 2	6.1	Areas between Curves
	5	March 05-09	6.2	Volumes
			6.3	Volumes by Cylindrical Shells
	6	March 12-16	6.5	Average Value of a Function
			7.1	Integration by Parts
			Exam I	Wed., March 15, 2017; Time: 6:30-8:30 pm; Location: Building 54; Material [5.1 – 6.2]
	7	March 19- 23	7.2	Trigonometric Integrals
			7.3	Trigonometric Substitution
	8	March 26-30	7.4	Integration of Rational Functions by Partial Fractions + Exercise 59
			7.5	Strategy for Integration
April 2-6, Midterm Break				
9	April 9- 13	7.8	Improper Integrals (up to end of Example 8)	
		8.1	Arc Length	
10	April 16-20	Exam II	Sunday, April 16, 2017; Time: 6:30-8:30 pm; Location: Building 54; Material [6.3 – 7.8]	
		8.2	Area of a surface of revolution	
11	April 23- 27	11.1	Sequences	
		11.2	Series	
12	April 30- May 4	11.3 ⁽²⁾	The Integral Test and Estimates of Sums	
		11.4	The Comparison Tests	
13	May 7-11	11.5	Alternating Series	
		11.6	Absolute Convergence and the Ratio and Root Tests	
14	May 14- 18	11.7	Strategy for Testing Series	
		11.8	Power Series	
15	May 21- 25	11.9	Representation of Functions as Power Series	
		11.10 ⁽³⁾	Taylor and Maclaurin Series	
Final Exam (Comprehensive, MCQ): Monday, June 5, 2017, Building 54, 9:00-12:00 pm				

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Notes:

(1): Students should know Formulas 5, 6, and 7 on page 374.

(2): Students should know the “Remainder Estimate for the Integral Test”. Example 5a and Example 6 are excluded.

(3): Students should know the Maclaurin Series listed in the table on page 762.

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Recitation and Suggested Homework Problems	Sec	Suggested Homework Problems	Recitation Problems	CAS*
	5.1	2, 14, 19, 22	3, 20, 23	11
	5.2	4, 6, 18, 22, 30, 33, 37, 44, 47, 51, 58, 61, 63	1, 17, 23, 40, 42, 48, 52, 57	13, 31
	5.3	2(a,b), 8, 16, 29, 43, 46, 56, 63, 70, 72, 75	13, 44, 48, 57, 74	-
	5.4	14, 18, 38, 46, 60	3, 13, 31, 40, 62	47
	5.5	19, 23, 38, 39, 59, 62, 86, 90, 91	28, 43, 69, 87	76
	6.1	13, 17, 22, 23, 31, 55	4, 12, 52(b)	36
	6.2	4, 16, 17, 33, 42, 49, 54	12, 34, 39, 56	37
	6.3	4, 12, 19, 22, 38, 45	11, 16, 26, 37, 47	36
	6.5	6, 9, 14	4, 13	12
	7.1	8, 12, 18, 30, 39, 42, 54, 62	11, 21, 22, 26, 33, 61	44
	7.2	2, 10, 27, 41, 50, 58, 64	15, 26, 34, 43	51
	7.3	8, 16, 21, 24, 28, 41	11, 27, 30, 34	36
	7.4	6, 16, 20, 28, 36, 45, 62	15, 24, 30, 47, 61	55
	7.5	6, 22, 23, 32, 52, 67, 73	39, 71, 80	-
	7.8	8, 22, 27, 33, 40, 57, 58	1, 2, 7, 30, 34, 59	-
	8.1	8, 14, 18, 31, 41	10, 12, 33	21
	8.2	10, 11, 14, 15, 26	25, 29	24
	11.1	14, 30, 42, 55, 70, 76	37, 44, 74	58
	11.2	15, 20, 25, 30, 41, 44, 52, 62, 67	22, 35, 46, 59, 74	12
	11.3	6, 10, 20, 30, 40	8, 12, 19, 32	-
	11.4	4, 10, 24, 32, 36	6, 13, 27, 45	-
	11.5	6, 10, 12, 23, 34	5, 15, 24, 32	22
	11.6	5, 11, 18, 21, 28, 32	4, 13, 16, 23, 30, 37	-
	11.7	5, 8, 17, 18, 20, 32, 38	14, 23, 24, 31	-
	11.8	8, 17, 24, 28, 30	9, 20, 27, 29	-
	11.9	4, 9, 14, 16, 28, 40(a,b)	8, 17, 32, 40(c)	-
	11.10	12, 20, 33, 49, 54, 60, 67	17, 32, 56, 59, 68	39
<p>*: CAS problems require the use of a technology tool (e.g., graphing calculators or a computer). You are encouraged to do these problems in order to enhance your understanding of the concepts involved.</p>				

Tips on how to enhance your problem-solving abilities:

1. Please do all the homework assignments on time.
2. You are urged to practice (but not memorize) more problems than the above lists.
3. You should always try to solve a problem on your own before reading the solution or asking for help.
4. If you find it difficult to handle a certain type of problem, you should try more problems of that type.
5. You should try the recitation problems before coming to class.
6. You are encouraged to solve some of the review problems at the end of each chapter.
7. The practice you get doing homework and reviewing the class lectures and recitations will make exam problems easier to tackle.
8. Try to make good use of the office hours of your instructor.

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Learning Outcomes	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> 1. Comprehend the concept of definite and indefinite integrals; 2. Comprehend the concept of Fundamental theorem of calculus; 3. Apply various techniques of integrations; 4. Comprehend the concept of finding area, arc length, surface and volume of solid of revolution; 5. Apply improper integrals and techniques to solve improper integrals; 6. Describe infinite sequence and series and different methods to check for convergence and divergence; 7. Comprehend the representation of a function as a power series; 8. Describe Taylor and Maclaurin series representation of functions.

Grading Policy	Exam I A common multiple choice exam	Material: 5.1 - 6.2	Place: Building 54	25% (100 points)
		Date: Wed., March 15	Time: 6:30-8:30 pm	
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	Class Work	It is based on quizzes, class tests, or other class activities determined by the instructor. Any quiz or test under class activity should be of written type and not of multiple-choice type. The average \bar{x} (out of 40) of the class work of the sections taught by an instructor must be in the interval $[28,30]$.		10% (40 points)
	Passing Grade	A student must score at least 50% (200 points) to pass the course.		

Exam Questions	The questions of the common exams are based on the examples, homework problems, recitation problems, and the exercises of the textbook.
Missing Exam I or Exam II	No makeup exam will be given under any circumstance. When a student misses Exam I or Exam II for a legitimate reason (such as medical emergencies), his grade for this exam will be determined based on an existing formula, which depends on his performance in the non-missed exam and in the final exam.
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Notes:

- (1) Students must know Formulas 5, 6, and 7 on page 381.
- (2) The “Remainder Estimate for the Integral Test”. Example 5a and Example 6 are excluded.
- (3) Students must know the Maclaurin Series listed in Table 1 on page 768.

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	5.2	4, 6, 18, 22, 30, 33, 37, 47, 51, 58, 61, 63,74	1, 9, 17, 23, 34, 40, 42, 48, 52, 57, 73	13, 31
	5.3	2(a,b), 8, 16, 29, 43, 46, 56, 63, 70, 75, 83	13, 44, 48, 57, 74, 76	-
	5.4	14, 18, 38, 46, 60	3, 13, 31, 40, 62	47
	5.5	19, 23, 38, 39, 59, 62, 88, 91	28, 43, 69, 73, 87, 92	76
	6.1	13, 17, 22, 23, 33	4, 12, 29, 35	30
	6.2	4, 16, 17, 33, 42, 49, 54, 58	12, 34, 39, 56, 63	37
	6.3	4, 12, 19, 22, 38, 45	11, 16, 26, 37, 47	36
	6.5	6, 9, 14	4, 13	12
	7.1	8, 12, 18, 30, 39, 42, 54, 62, 66	11, 21, 22, 33, 40, 61	44
	7.2	2, 10, 27, 41, 50, 58, 64	15, 34, 43, 63	51
	7.3	8, 16, 21, 24, 28, 41	11, 27, 30, 34, 43	36
	7.4	6, 16, 20, 28, 36, 45, 49, 53, 62	15, 24, 30, 47, 54, 61	55
	7.5	6, 22, 23, 32, 52, 67, 73	39, 71, 80, 84	-
	7.8	8, 22, 27, 33, 40, 41, 57, 58	1, 2, 7, 30, 34, 42, 59	-
	8.1	8, 14, 18, 41, 45	10, 12, 19	21
	8.2	10, 11, 14, 15, 27	16, 28, 33, 35	24
	11.1	14, 30, 42, 55, 59, 76	37, 44, 62, 74	58
	11.2	15, 20, 25, 30, 41, 44, 52, 62, 67	22, 35, 46, 59, 75	12
	11.3	6, 10, 20, 30, 46	8, 12, 19, 32	-
	11.4	4, 10, 24, 32	6, 13, 27, 45	-
	11.5	6, 10, 12, 23, 34	5, 15, 24, 32	22
	11.6	5, 11, 18, 21, 28, 32, 39	4, 13, 16, 23, 30, 37, 40	-
	11.7	5, 8, 17, 18, 20, 32, 38	14, 23, 24, 31	-
	11.8	8, 17, 24, 28, 30	9, 20, 27, 29	-
	11.9	4, 9, 14, 16, 28, 40(a,b)	8, 17, 32, 40(c)	-
	11.10	12, 20, 33, 35, 41, 54, 63, 67, 73, 74	17, 32, 40, 42, 56, 68, 79	46
<p>*: CAS problems require the use of a technology tool (e.g., graphing calculators or a computer). You are encouraged to do these problems in order to enhance your understanding of the concepts involved.</p>				

Tips on how to enhance your mathematical skills and achieve better grades:

1. First, Consult your instructor immediately whenever you need help.
2. Take notes during classes and study your notes and textbook on the same day.
3. Do each homework assignment immediately.
4. Master the examples and homework problems of each section plus the recitation problems.
5. Try solving the recitation problems before coming to class.
6. When practicing some problems, Time yourself to finish your solution before reading answers. That is, adapt yourself to the exam environment.
7. Solve some of the review problems at the end of each chapter.
8. Lastly and most importantly, study in the Library.