King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics
Math 102 – Syllabus
2015-2016 (151)
Coordinator: Dr. I. Al-Rasasi

Title: Calculus II

Credit: 4-0-4

Textbook: Thomas Calculus (Early Transcendental) by G. Thomas, M. Weir and J. Hass. 12th edition, Pearson (2010).

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 Maclarin series.

Learning Outcomes:

Upon successful completion of this course, the student should be able to

1. Estimate areas of regions under curves.
2. State and apply the Fundamental Theorem of Calculus.
3. Evaluate integrals using various techniques of integration (substitution, by parts, trigonometric integrals, by partial fractions).
4. Compute areas between curves, lengths of curves, volumes and surface areas of solids of revolutions.
5. Identify and evaluate improper integrals.
6. Compute limits of sequences.
7. Apply convergence tests to determine the convergence and/or the divergence of series.
8. Find the sum of some selected types of series.
9. Write a function as a power series.

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Grading Policy:

1. **Exam I** A common multiple choice exam	**Material:** (5.3-6.4)	**Place:** Building 54	25% (100 points)
	Date: Tuesday, Oct. 13, 2015	**Time:**	
2. **Exam II** A common written exam	**Material:** (7.1-10.2)	**Place:** Building 54	25% (100 points)
	Date: Tuesday, Nov. 10, 2015	**Time:**	
3. **Final Exam** A comprehensive common multiple choice exam	**Material:** (Comprehensive)	**Place:** Building 54	35% (140 points)
	Date: Saturday, Dec. 26, 2015	**Time: 8:00 – 11:00 AM**	
4. **Class Work**	**i) Online Homework:** The web address for online homework is **kfupm.mylabsplus.com**		5% (20 points)
	ii) Class Activities: 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 x (out of 40) of class activities of the sections taught by the same instructor should be in the interval [24, 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-missing 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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Week	Dates (2015)	Sec.	Topics
1	Aug. 23- 27	5.3	The Definite Integral
		5.4	The Fundamental Theorem of Calculus
2	Aug. 30- Sep. 03	5.5	Indefinite Integrals and the Substitution Method
		5.6	Substitution and Area between Curves
3	Sep. 06- 10	5.6	Continued
		6.1	Volumes Using Cross Sections
4	Sep. 13- 17	6.2	Volumes Using Cylindrical Shells
		6.3	Arc Length
Sep. 20- 28: Id Al-Adha Vacation			
5	Sep. 29- Oct. 1	6.4	Areas of Surfaces of Revolution
		7.1	The Logarithm Defined as an Integral
6	Oct. 4- 8	7.3	Hyperbolic Functions (Up to End of Example 1, p.438)
		8.1	Integration by Parts
Exam I: Tuesday, Oct. 13, 2015 [pm]. Material: 5.3- 6.4. Building 54.			
7	Oct. 11- 15	8.1	Continued
		8.2	Trigonometric Integrals
8	Oct. 18- 22	8.3	Trigonometric Substitutions
		8.4	Integration of Rational Functions by Partial fractions
9	Oct. 25- 29	8.4	Continued
		8.7	Improper Integrals
10	Nov.1- 5	10.1	Sequences
		10.2	Infinite series
11	Nov. 8- 12	10.3	The Integral Test
		10.4	Comparison Tests
Exam II: Tuesday, Nov. 10, 2015 [pm]. Material: 7.1- 10:1. Building 54.			
12	Nov. 15- 19	10.4	Continued
		10.5	The Ratio and Root Test
13	Nov. 22- 26	10.6	Alternating Series, Absolute & Conditional Convergence
		10.7	Power series
14	Nov. 29- Dec. 3	10.7	Continued
		10.8	Taylor and Maclurin Series
15	Dec. 6- 10	10.9*	Convergence of Taylor Series
		10.10**	The Binomial Series and Applications of Taylor Series
16	Dec. 13- 14		Catch up and/or Review **(A Normal Tuesday Class)**
Final Exam: Saturday, Dec. 26, 2015 [8:00- 11:00 am], Building 54.(Comprehensive)			

***: Theorem 24 and Examples 1, 2 & 3 are not included.**

****: Students are required to know the series listed in Table 10.1, p. 620.**

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Homework & Recitation Problems

Section	Homework Problems	Recitation Problems	CAS*
5.3	6, 9, 16, 22, 29, 40, 52,60, 73, 78	14,62,65,76	92, 101
5.4	6,9,16,24,27,32,40,48,57,67,73,77	14,31,44,60,68	88
5.5	4,14,21,26,39,52,53,66,70,76	15,25,40,62,74	
5.6	2,4,9,15,20,26,39,47,63,68,74,84,85,105	8,58,75,106	120
6.1	2,6,12,15,17,20,27,29,42,46,52,55	6,24,32,53	62(c)
6.2	2,8,19,24,28a,28b,33,39,48	4,11,22,27,35	
6.3	1,4,9,11,20,23	2,10,14,19	36
6.4	1a,4a,10,14,17,24,25	8a, 9,13,19	4(b,c)
7.1	2,4,8,18,30,40,48,52,53	1,11,31,54	58(c), 66
7.3	4, 9, 11,14,17,23,42,54,79	1,10,18,43	
8.1	4,11,24,26,29,33,36,50,53,59,73	6,28,37,50,74	
8.2	3,7,14,23,28,36,38,44,48,56,58,63,68,70	4,16,44,47,55	
8.3	1,8,13,16,23,32,36,46,52,54	5,11,21,45,50	
8.4	6, 13, 16, 17, 20, 22, 29, 34, 43, 48, 55	7, 15, 19, 33, 46	59
8.7	2, 5, 10, 19, 22, 29, 32, 33, 37, 40, 42, 45, 56, 71	21, 29, 46, 52, 70	76 (a)
10.1	4, 10, 16, 25, 28, 38, 42, 52, 60, 71, 84, 88, 91, 97	11, 18, 39, 59, 86, 92	142
10.2 Part I	6, 10, 12, 18, 23, 30, 31, 37, 38, 41, 44, 47	5, 13, 17, 37, 45, 65, 77, 90	
10.2 Part II	50, 54, 59, 62, 66, 68, 71, 74, 75, 78, 79, 91		
10.3	3, 8, 12, 16, 19, 22, 26, 40	6, 15, 21, 37, 39	43(b)
10.4	7, 10, 14, 23, 27, 35, 45, 54	9, 24, 25, 28, 53	69
10.5	4, 8, 12, 14, 22, 25, 29, 42, 62	6, 15, 26, 53, 61	
10.6	2, 8, 12, 16, 23, 29, 43, 46, 50	4, 11, 28, 45, 49	67
10.7	4, 5, 12, 14, 22, 34, 35, 40, 44, 49	6, 16, 21, 33, 48	
10.8	10, 12, 18, 22, 25, 30, 34	17, 24, 33	
10.9	2, 4, 10, 22, 24, 28, 30	3, 7, 9, 21, 33	54
10.10	2, 10, 12, 32, 36, 44, 52, 68	9, 10, 37, 46, 67	15, 24

*** 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.

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 problems, 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.