King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics
Math 102 – Syllabus
2014-2015 (142)
Coordinator: Dr. Bader Al Humaidi

Title: Calculus II

Credit: 4-0-4

Textbook: Thomas Calculus (Early Transcendentals) 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 Maclaurin series.

Grading Policy:

1. **Exam I** A common multiple choice exam	**Material:**5.3-6.4	**Place:** Building 54	25% (100 points)
	Date: Tuesday, March 3, 2015	**Time: 06:15-08:15 PM**	
2. **Exam II** A common written exam	**Material:**7.1-10.1	**Place:** Building 54	25% (100 points)
	Date: Tuesday, April 14, 2015	**Time: 06:30-8:00 PM**	
3. **Final Exam** A comprehensive common multiple choice exam	**Material:** Comprehensive	**Place:** Building 54	35% (140 points)
	Date: Sunday, May 24, 2015	**Time: 07:00-10:00 PM**	
4. **Class Work**	**i) Online Homework:** The web address for online homework is **kfupm.mylabsplus.com**		5% (20 points)
	ii) Class Activities: 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 x (out of 40) of class activities of the sections taught by the same instructor must 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-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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Week	Dates (2014)	Sec.	Topics
1	January 25-29	5.3	The Definite Integral
		5.4	The Fundamental Theorem of Calculus
2	February 01-05	5.5	Indefinite Integrals and the Substitution Method
		5.6	Substitution and Area Between Curves
3	February 08-12	5.6	Continued
		6.1	Volumes Using Cross-Sections
4	February 15-19	6.2 6.3	Volumes Using Cylindrical Shells Arc Length
5	February 22-26	6.4	Areas of Surfaces of Revolution
		7.1	The Logarithm Defined as an Integral
6	March 01-05	7.3	Hyperbolic Functions (No Inverse Hyperbolic Functions)
		Exam I	**Tuesday, March 3, 2015 [06:15-08:15 PM] Building 54; Material [5.3-6.4]**
7	March 08-12	8.1	Integration by Parts
		8.2	Trigonometric Integrals
8	March 15-19	8.3	Trigonometric Substitutions
		8.4	Integration of Rational Functions by Partial Fraction
March 22-26: Midterm Vacation			
9	Mar 29-Apr 02	8.4	Continued
		8.7	Improper Integrals
10	Apr 05-09	10.1	Sequences
		10.2	Series
11	Apr 12-16	10.2	Continued
		10.3	The Integral Test
		Exam II	**Tuesday, April 14, 2015 [6:30-8:00 PM] Building 54; Material [7.1-10.1]**
12	Apr 19-23	10.4	Comparison Tests
		10.5	The Ratio and Root Tests
13	Apr-26-30	10.6	Alternating Series, Absolute and Conditional Convergence
		10.7	Power Series
14	May 03-07	10.8	Taylor and Maclaurin Series
		10.9*	Convergence of Taylor Series
15	May 10-14	10.10**	The Binomial Series and Applications of Taylor Series
	Final Exam: Sunday, May 24, 2015 **[07:00-10:00 PM] Building 54; Material: Comprehensive**		

*** Theorem 24 and Examples 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	1,10,18,43,81	
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, 20, 26, 32, 36, 44, 52, 68	9, 19,25, 37, 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.

Math102 Courses Learning Outcomes

Upon completion of this course, students should be able to understand:

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 Maclarin series representation of functions.