King Fahd University of Petroleum and Minerals

Department of Mathematics & Statistics
Math 201 – Syllabus
2015/2016 (153)
Coordinator: Jawad Abuihlail (Room: 5-507; Tel: 4737)

Title:	Calculus III
Credit:	3-0-3
Textbook:	Calculus (Early Transcendental) by J. Stewart, 7th edition, Brooks/Cole, 2012.
Description:	Polar coordinates, polar curves, area in polar coordinates. Vectors, lines, planes and surfaces. Cylindrical and spherical coordinates. Functions of two and three variables, limits and continuity. Partial derivatives, directional derivatives. Extrema of functions of two variables. Double integrals, double integrals in polar coordinates. Triple integrals, triple integrals in cylindrical and spherical coordinates.

Learning Outcomes:

Upon completion of this course, students should be able to

- Explain the techniques of analytic geometry in the plane and in the space;

- Explain the concept of vectors and parametric equations in the plane and in the space;

- Graph essential surfaces, compute limits and continuity, partial derivatives, directional derivatives and the gradient vector;

- Explain the concept of differentiability, tangent planes and chain rule

- Find and classify extreme values of functions of two variables, including Lagrange multipliers for constrained optimization problems;

- Compute multiple integrals with rectangular, polar, cylindrical, and spherical coordinates and identify some applications of the double and triple integrals.

Grading Policy: (Notice that the letter grade D begins with 200/400, i.e. 50%)

1. **Exam I** A common exam (written)	**Material:** (10.1 - 12.4)	**Place:** Bldg 57 Rooms 303-311	25% (100 points)
	Date: Thursday, 28.7.2016	**Time:** 7:00 – 9:00 PM.	
2. **Exam II** A common exam (written)	**Material:** (12.5 - 14.6)	**Place:** TBA	25% (100 points)
	Date: Tuesday 16.8.2016;	**Time:** 7:00 – 9:00 PM.	
3. **Final Exam** A comprehensive common exam (written)	**Material:** (Comprehensive)	**Place:** Exb. Center-A	35% (140 points)
	Date: Tuesday 30.8.2016;	**Time:** 7:00 – 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:** 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 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 (see p. 38 of the Undergraduate Bulletin 2006-2009). A DN grade will be awarded to any student who accumulates 8 unexcused absences.

Academic Integrity: All KFUPM policies regarding ethics apply to this course.
===

Pacing Schedule

Week	Dates (2016)	Sec.	Topics (25 sections)
1	July 11-16	10.1	Curves Defined by Parametric Equations
		10.2	Calculus with Parametric Curves
		10.3	Polar Coordinates
		10.4	Areas and Lengths in Polar Coordinates
2	July 17-21	12.1	Three-Dimensional Coordinate Systems
		12.2	Vectors
		12.3	The Dot Product
		12.4	The Cross Product
3	July 24-28	12.5	Equations of Lines and Planes
		12.6	Cylinders and Quadric Surfaces
Exam I: Material 11.1- 12.4; Thursday, July 28, 2016.			
4	July 31-August 4	14.1	Functions of Several Variables
		14.2	Limits and Continuity
		14.3	Partial Derivatives
		14.4	Tangent Planes & Linear Approximation
5	August 7-11	14.5	The Chain Rule
		14.6	Directional Derivatives and the Gradient Vector
		14.7	Maximum and Minimum Values
6	July 13-17	14.8	Lagrange Multipliers
		15.1	Double Integrals over Rectangles
		15.2	Iterated Integrals
Exam II: Material 12.5- 14.6; Tuesday, August 16, 2016.			
7	August 20-24	15.3	Double Integrals over General Regions
		15.4	Double Integrals in Polar Coordinates
		15.7	Triple Integrals
8	August 27-29	15.8	Triple Integrals in Cylindrical Coordinates
		15.9	Triple Integrals in Spherical Coordinates
Final Exam (Comprehensive): Tuesday August 30, 2016; 7:00 – 10:00 PM			

Suggested Practice Problems

10.1	2, 3, 5, 7, 8, 10, 12, 14, 19, 23, 24
10.2	4, 6, 8, 11, 15, 17, 20, 23, 31, 41
10.3	1, 3, 9, 10, 11, 14, 17, 25, 35, 39, 40, 57, 61
10.4	3, 5, 8, 9, 24, 31, 37, 38
12.1	7, 11, 13
12.2	2, 3, 4, 6, 7, 9, 13, 15, 17, 19, 21, 23, 25, 26, 29, 43, 44, 45
12.3	1, 3, 5, 7, 9, 11, 12, 17, 19, 22, 23, 25, 26, 39, 41, 43, 55, 61, 64.
12.4	1, 3, 5, 13, 14, 15, 17, 19, 27, 28, 29, 31
12.5	3, 4, 5, 6, 7, 9, 10, 11, 13, 15, 16, 17, 23, 25, 26, 27, 31, 33, 35, 45, 47, 48
12.6	4, 6, 11, 13, 32, 33, 41, 43, 47
14.1	9, 11, 13, 15, 17, 45, 47
14.2	1, 9, 11, 33, 34, 36
14.3	15, 16, 19, 29, 21, 22, 25, 27, 29, 31, 33, 34, 35, 41, 43, 53, 55, 61, 63, 69
14.4	3, 5, 11, 13, 19, 21
14.5	1, 3, 5, 7, 9, 10, 21, 23, 25, 35, 39
14.6	7, 9, 11, 12, 15, 17, 20, 21, 25, 26, 27, 29, 31, 34, 35, 38
14.7	6, 9, 11, 16, 30, 33, 40, 43, 44, 51
14.8	4, 6, 7, 15, 20, 21, 30, 34
15.1	2, 11, 12, 14
15.2	3, 5, 7, 9, 11, 15, 17, 19, 21, 25, 27, 29
15.3	5, 8, 12, 13, 16, 19, 20, 30, 38
15.4	5, 6, 7, 8, 9, 11, 13, 14, 19, 21, 22, 24, 25, 29, 31
15.7	3, 5, 6, 7, 9, 11, 13, 15, 19, 21
15.8	17, 19, 21, 22, 23, 29, 30
15.9	5, 6, 9, 15, 17, 21, 23, 25, 26, 27, 30, 39, 41

❖ **Tips on how to enhance your problem-solving abilities (by compliments of Dr. Al-Rasasi)**

➢ Do all the homework assignments on time.
➢ Practice (but not memorize) more problems than the above lists.
➢ You are encouraged to solve some of the review problems at the end of each chapter.
➢ Try to solve a problem on your own before reading the solution or asking for help.
➢ If you find it difficult to handle a certain type of problems, you should try more problems of that type.
➢ Review the last lecture before coming to class.
➢ Practicing homework problems and reviewing the class lectures will make exam problems easier to tackle.
➢ Visit your instructor in his office hours. Always bring partial solution of the questions, which you want to discuss with your instructor.