

King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics
Math 201 – Syllabus
2016-2017 (Term 161)
Coordinators: Dr. Mohamed El-Gebeily (Room: 5-325, Tel 3728)

Title: Calculus III

Credit: 3-0-3

Textbook: J. Stewart, Calculus (Early Transcendental) 7th edition, Brooks/Cole.

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:

1. Exam I (written)	Material: 10.1 – 12.4	Place: TBA	25% (100 points)
	Date: October 26, 2016	Time: 5:45PM	
2. Exam II (written)	Material: 12.5 – 14.6	Place: TBA	25% (100 points)
	Date: December 7, 2016	Time: 5:45PM	
3. Final Exam	Material: Comprehensive	Place: TBA	35% (140 points)
	Date: January 12, 2017	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 all sections taught by the same instructor should be in the interval [28, 30].		10% (40 points)

Level of exam questions: Common exam questions are of the same level as the examples, homework problems and exercises of the textbook.

Missing Exam I or Exam II: No makeup is given under any circumstances. If a student misses either Exam I or Exam II for a legitimate reason (such as medical emergencies), his grade in the missed exam is calculated by an existing formula, which depends on his performance in the non-missed exam and the final.

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.

Coverage Pace:

Week	Date	Sec.	Topics (25 sections)
1	Sep.18-21	10.1 10.2	Curves Defined by Parametric Equations Calculus with Parametric Curves
National Day Holiday, 22 September 2016			
2	Sep.25-29	10.3 10.4	Polar Coordinates Areas and Lengths in Polar Coordinates
3	Oct. 2-6	12.1 12.2	Three-Dimensional Coordinate Systems Vectors
4	Oct. 9-13	12.3 12.4	The Dot Product The Cross Product
5	Oct. 16-20	12.5	Equations of Lines and Planes
First Major Exam (10.1-12.4), 5:45PM, Wednesday, October 26, 2016			
6	Oct. 23-27	12.6 14.1	Cylinders and Quadric Surfaces Functions of Several Variables
7	Oct. 30- Nov 3	14.2 14.3	Limits and Continuity Partial Derivatives
8	Nov. 6-10	14.4 14.5	Tangent Planes & Linear Approximation The Chain Rule
Mid-Term break, Nov. 13-17			
9	Nov. 20-24	14.6	Directional Derivatives and the Gradient Vector
10	Nov. 27-Dec. 1	14.7	Maximum and Minimum Values
Second Major Exam (12.5-14.6), 5:45PM, Wednesday, Dec. 7, 2016			
11	Dec. 4-8	14.8	Lagrange Multipliers
12	Dec. 11-15	15.1 15.2	Double Integrals over Rectangles Iterated Integrals
13	Dec. 18-22	15.3 15.4	Double Integrals over General Regions Double Integrals in Polar Coordinates
14	Dec. 25-29	15.7 15.8	Triple Integrals Triple Integrals in Cylindrical Coordinates
15	Jan 1-5	15.9	Triple Integrals in Spherical Coordinates
	Jan 8	Normal Thursday Classes	

Suggested Practice Problems

Section	Problems
10.1	2, 3, 5, 7, 8, 10, 12, 14, 19, 24
10.2	4, 6, 8, 11, 15, 17, 20, 29, 32, 41, 60
10.3	1, 3, 9, 10, 11, 17, 25, 35, 39, 40, 57, 61
10.4	3, 5, 8, 9, 24, 26, 31, 37, 38
12.1	3, 7, 11, 13, 18, 19
12.2	2, 3, 4, 6, 7, 9, 13, 15, 17, 19, 21, 23, 25, 26, 29, 43
12.3	1, 3, 5, 7, 9, 11, 12, 17, 19, 22, 23, 25, 26, 39, 41, 43, 55, 64
12.4	1, 3, 5, 13, 14, 15, 17, 19, 27, 28, 29, 31, 35
12.5	3, 4, 5, 6, 7, 9, 10, 11, 13, 15, 16, 23, 25, 26, 27, 31, 33, 35, 45, 47, 48
12.6	4, 6, 11, 13, 23, 28, 32, 33, 41
14.1	9, 11, 13, 15, 17, 45, 47
14.2	1, 9, 11, 12, 13, 20, 33, 34
14.3	15, 16, 19, 20, 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, 13, 15, 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, 16, 19, 20, 30, 38, 48, 53
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	1, 3, 5, 7, 10, 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*

- Do all the homework assignments on time and practice more problems than the ones listed above.
- It is recommended that you solve some of the review problems at the end of each chapter.
- Try to solve problems on your own before reading the solution or asking for help.
- If you find it difficult to handle a problem of a certain type, you should try more problems of the same type.
- Review the previous lecture before coming to class.
- Practicing homework problems and reviewing class lectures will make it easier to tackle exam problems.
- Make use of your instructor's office hours. Always bring partial solution of the questions which you want to discuss with your instructor.