

King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics
Math 201 – Syllabus
2016-2017 (Term 162)
Coordinators: Dr. Ahmet Emin Tatar

Title: Calculus III

Credit: 3-0-3

Textbook: J. Stewart, Calculus (Early Transcendental) 8th 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:

Exam I (written)	Material: 10.1 – 12.4	Place: Building 57	25% (100 points)
	Date: March 9, 2017	Time: TBA	
Exam II (written)	Material: 12.5 – 14.6	Place: Building 57	25% (100 points)
	Date: April 18, 2017	Time: TBA	
Final Exam	Material: Comprehensive	Place: TBA	35% (140 points)
	Date: May 31, 2017	Time: 12:30 PM – 3:30PM	
Class Work	i) Online Homework: Online homework is provided through BlackBoard		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)

Passing Grade: A student should achieve at least 50%(200 points) to pass this course.

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	Feb. 05-09	10.1 10.2	Curves Defined by Parametric Equations Calculus with Parametric Curves
2	Feb. 12-16	10.3 10.4	Polar Coordinates Areas and Lengths in Polar Coordinates
3	Feb. 19-23	12.1 12.2	Three-Dimensional Coordinate Systems Vectors
4	Feb. 26-Mar. 2	12.3 12.4	The Dot Product The Cross Product
5	Mar. 05-09	12.5	Equations of Lines and Planes
First Major Exam (10.1-12.4), Thursday, March 09, 2017			
6	Mar. 12-17	12.6 14.1	Cylinders and Quadric Surfaces Functions of Several Variables
7	Mar. 19-24	14.2 14.3	Limits and Continuity Partial Derivatives
8	Mar. 26-30	14.4 14.5	Tangent Planes & Linear Approximation The Chain Rule
Mid-Term break, April 02-06			
9	Apr. 09-13	14.6	Directional Derivatives and the Gradient Vector
10	Apr. 16-20	14.7	Maximum and Minimum Values
Second Major Exam (12.5-14.6), Tuesday, April 18, 2017			
11	Apr. 23-27	14.8	Lagrange Multipliers
12	Apr. 30-May 04	15.1 15.2	Double Integrals over Rectangles Iterated Integrals
13	May 07-11	15.3 15.4	Double Integrals over General Regions Double Integrals in Polar Coordinates
14	May 14-18	15.7 15.8	Triple Integrals Triple Integrals in Cylindrical Coordinates
15	May 21-25	15.9	Triple Integrals in Spherical Coordinates

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.