

King Fahd University of Petroleum and Minerals

Department of Mathematics and Statistics

Math 201, Syllabus, Term 173 (2017-2018)

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Title & Credit: Calculus III (3-0-3)

Textbook: Calculus (Early Transcendentals), by J. Stewart, 8th edition, Brooks/Cole, 2016.

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.

Prerequisite: Math 102.

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

1. Describe curves given by parametric and polar equations in the plane;
2. Calculate areas, slopes, surface, areas, arc length for curves given by parametric and polar equations in the plane;
3. Explain and apply the techniques of analytic geometry of space;
4. Perform vector operations in space;
5. Find the equations of lines and planes in the space;
6. Sketch and identify basic quadric surfaces;
7. Calculate the limits of multivariable functions, and analyze their continuity and differentiability;
8. Calculate the partial derivatives, directional derivatives, tangent planes, and the gradient vector;
9. Find and classify extreme values of functions of several variables;
10. Evaluate and apply multiple integrals in rectangular, polar, cylindrical, and spherical coordinate systems.

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.

The Usage of Mobiles in Class: Students are not allowed to use mobiles for any purpose during class time. Students who want to use electronic devices to take notes must take

permission from their instructor. Violations of these rules will result in a penalty in students' class work grade.

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

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.

Grading Policy:

Exam I (Written)	Material: 10.1 – 12.4	Place: Building 54	25%
	Date: Wed., July 11, 2018	Time: 4:30- 6:30 pm	(100 points)
Exam II (Written)	Material: 12.5 – 14.6	Place: Building 54	25%
	Date: Tuesday., July 24, 2018	Time: 4:30- 6:30 pm	(100 points)
Final Exam (50% Written- 50% MCQ)	Material: Comprehensive	Place: Building 54	35%
	Date: Monday, Aug. 13, 2018	Time: 7:00- 10:00 PM	(140 points)
Class Work	i) Online Homework: Check Blackboard.		5%
	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 [28, 30].		10% (40 points)

The Passing Grade: 50% (200/ 400).

Pacing Schedule:

Week	Date (2018)	Sec.	Title (24 sections)
1	June 24-28, and Sat. June 30.	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 1-5	12.1	Three-Dimensional Coordinate Systems
		12.2	Vectors
		12.3	The Dot Product
		12.4	The Cross Product
3	July 8-12	12.5	Equations of Lines and Planes
		12.6	Cylinders and Quadric Surfaces
		14.1	Functions of Several Variables
		14.2	Limits and Continuity
Exam I: Wednesday, July 11 (4:30-6:30 pm, Building 54), 10.1- 12.4			
4	July 15-19	14.3	Partial Derivatives
		14.4	Tangent Planes and Linear Approximation
		14.5	The Chain Rule
		14.6	Directional Derivatives and The Gradient Vector
5	July 22-26	14.7	Maximum and Minimum Values
		14.8	Lagrange Multipliers
		15.1	Double Integrals over Rectangles
Exam II: Tuesday, July 24 (4:30-6:30 pm, Building 54), 12.5- 14.6			
6	July 29- Aug. 2	15.2	Double Integrals over General Regions
		15.3	Double Integrals in Polar Coordinates
		15.6	Triple Integrals
7	Aug. 5-9	15.7	Triple Integrals in Cylindrical Coordinates
		15.8	Triple Integrals in Spherical Coordinates
8	Aug. 12		Review and/or Catching up
Final Exam: Monday, Aug. 13, 2018; 7:00-10:00 PM, Building 54			

Note: There will be 5 lectures per week. The duration of each lecture is 60 minutes. The total number of lectures is 37.

Suggested Practice Problems:

	Section Number	Exercises Numbers
1	10.1	2, 3, 5, 7, 8, 10, 12, 14, 19, 23, 24
2	10.2	4, 6, 8, 11, 15, 17, 20, 32, 33, 41, 61, 66
3	10.3	1, 3, 5(b), 9, 11, 14, 17, 25, 35, 39, 40, 57, 61
4	10.4	3, 5, 9, 19, 24, 27, 31, 33, 38, 46, 50
5	12.1	7, 11, 13, 18, 22, 23, 31, 38, 45
6	12.2	2, 3, 4, 6, 7, 9, 13, 15, 17, 19, 21, 25, 26, 29, 43, 44, 45
7	12.3	1, 3, 5, 9, 11, 17, 22, 23(c), 26, 38, 39, 41, 45, 47, 55, 64
8	12.4	3, 13, 15, 19, 27, 28, 29, 33, 36, 37, 43, 44,
9	12.5	4, 5, 7, 10, 13, 15, 15, 25, 26, 27, 31, 35, 45, 52, 57, 71
10	12.6	4, 6, 11, 13, 32, 33, 43, 47
11	14.1	9, 11, 13, 15, 17, 25, 28, 45, 68
12	14.2	9, 11, 14, 21, 33, 34, 40, 41
13	14.3	15, 19, 21, 22, 25, 29, 33, 34, 35, 41, 43, 49, 55, 61, 63, 69, 71, 78(d)
14	14.4	3, 5, 11, 13, 19, 21, 26, 31, 33
15	14.5	1, 3, 5, 7, 9, 10, 21, 23, 25, 35, 39
16	14.6	7, 9, 11, 12, 15, 17, 20, 21, 25, 26, 27, 29, 31, 34, 35, 38
17	14.7	6, 9, 11, 16, 30, 33, 40, 43, 44, 51
18	14.8	4, 6, 7, 15, 20, 21, 29, 34
19	15.1	2, 11, 12, 14, 19, 23, 30, 32, 37, 40, 48
20	15.2	3, 5, 7, 9, 11, 15, 17, 19, 21, 25, 27, 29, 45, 50, 52, 55, 61
21	15.3	5, 8, 12, 13, 16, 19, 20, 26, 30, 33, 38
22	15.6	5, 6, 7, 8, 9, 11, 13, 14, 19, 21, 22, 24, 25, 29, 31
23	15.7	3, 5, 6, 7, 9, 11, 13, 15, 19, 21, 24, 29
24	15.8	7, 9, 17, 19, 21, 22, 23, 29(a), 30, 35, 41, 43

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 are encouraged to solve some of the review problems at the end of each chapter.
6. The practice you get doing homework and reviewing the class lectures will make exam problems easier to tackle.
7. Try to make good use of the office hours of your instructor.