

King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics MATH 201 – Syllabus Term 193
Prof. Monther R. Alfuraidan

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

1. Describe curves given by parametric and polar equations in the plane;
2. Calculate areas, slopes, surface area, arc length for curves in 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.

Grading Policy:

Online Exam I	Date: Saturday, 06 June 2020	Time: 1:30PM-2:30PM Material: 10.1 – 10.4	9% (27 Points)
Online Exam II	Date: Saturday, 13 June 2020	Time: 1:30PM-2:30PM Material: 12.1 – 12.4	9% (27 Points)
Online Exam III	Date: Saturday, 20 June 2020	Time: 1:30PM-2:30PM Material: 12.5 – 14.2	9% (27 Points)
Online Exam IV	Date: Saturday, 27 June 2020	Time: 1:30-2:30PM Material: 14.3 – 14.6	9% (27 Points)
Online Exam V	Date: Saturday, 04 July 2020	Time: 1:30PM-2:30PM Material: 14.7 – 15.1	9% (27 Points)
Online Exam VI	Date: Saturday, 11 July 2020	Time: 1:30PM-2:30PM Material: 15.2 – 15.6	9% (27 Points)
Online Final Exam	Date: Monday, 20 July 2020	Time: TBA Material: Comprehensive	30% (90 Points)
	Class Activities: It is based on WebAssign personal study plan-(practice and chapter) quizzes. The scores of each chapter will be match with the corresponding exam(s) to ensure integrity.		16% (48 Points)

The Course Passing Grade: A student must score at least **50% (150 Points)** to pass the course.

Upgrade Policy: The upgrade policy is applied when 3 points out of 300 are needed to get the next higher grade. For instance, the passing grade (D) starts at 150/300. If a student gets 148/300 or 149/300, then his grade will be automatically upgrade to D. However, if a student gets 147/300 his grade will be upgraded to D only if his final exam score percentage is greater than or equal 50% i.e. (52.5/105).

Exams:

Exam Questions: The questions of the exams are based on the examples, self-online quizzes, note problems and exercises in the textbook.

Cheating in Exams: Cheating or any attempt of cheating by use of illegal activities, techniques and forms of fraud will result in a grade of **F** in the course along with reporting the incident to the higher university administration. Cheating in exams includes (but is not limited to)

- Using any textbook, course notes, calculator, phone or receiving help from anyone or any other outside source.
- Disabling your cam.

Missing an Exam:

Exam (I, II, III IV,V,VI): No make-up exam will be given under any circumstances. In case a student misses any Exam for a legitimate reason (such as medical emergencies), his grade for this exam will be determined based on the existing formula which depends of his performance in the non-missed exam and in the final exam.

Final Exam: If a student misses the final exam for a legitimate reason (such as medical emergencies), he will be given a make-up final exam.

Attendance: Students are expected to attend all online lecture classes. The instructor has the right to use any method that prove the attendance.

- If a student misses a class, he is responsible for any announcement made in that class.
- A grade DN will be awarded to any student who accumulates
 - 06 unexcused absences.
 - 10 excused and unexcused absences.

Note: the general rule for DN: (See p. 38 of the Undergraduate Bulletin 2006- 2009).

- 20% unexcused absences of the number of classes, and
- 33% excused and unexcused absences of the number of classes.

WebAssign lockdown Browser is fully integrated and works flawlessly with Microsoft Edge Explorer. Therefore, the student is responsible for the consequences of any interruption due to any unstable internet connection, using other browsers and bad-quality camera occurring during online assessments.

Academic Integrity: All KFUPM policies regarding ethics apply to this course. See the Undergraduate Bulletin.

Pacing Schedule

Week	Date (2020)	Section	Topics (24 Sections)
1	May 31- June 04	10.1 10.2 10.3 10.4	Curves Defined by Parametric Equations Calculus with Parametric Curves Polar Coordinates Areas and Lengths in Polar Coordinates
Online Exam I - Saturday, 06 June 2020 - Time: 1:30PM-2:30PM - Material: 10.1 – 10.4			
2	June 07-11	12.1 12.2 12.3 12.4	Three-Dimensional Coordinates Systems Vectors The Dot Product The Cross Product
Online Exam II - Saturday, 13 June 2020 - Time: 1:30PM-2:30PM - Material: 12.1 – 12.4			
3	June 14-18	12.5 12.6 14.1 14.2	Equations of Lines and Planes Cylinders and Quadric Surfaces Functions of Several Variables Limits and Continuity
Online Exam III - Saturday, 20 June 2020 - Time: 1:30PM-2:30PM - Material: 12.5 – 14.2			
4	June 21-25	14.3 14.4 14.5 14.6	Partial Derivatives Tangent Planes & Linear Approximation The Chain Rule Directional Derivatives and the Gradient Vector
Online Exam IV - Saturday, 27 June 2020 - Time: 1:30PM-2:30PM - Material: 14.3 – 14.6			
5	June 28-July 02	14.7 14.8 15.1	Maximum and Minimum Values Lagrange Multipliers Double Integrals over Rectangles
Online Exam V - Saturday, 04 July 2020 - Time: 1:30PM-2:30PM - Material: 14.7 – 15.1			
6	July 05-09	15.2 15.3 15.6	Double Integrals over General Regions Double Integrals in Polar Coordinates Triple Integrals
Online Exam VI - Saturday, 11 July 2020 - Time: 1:30PM-2:30PM - Material: 15.2 – 15.6			
7	July 12-16	15.7 15.8	Triple Integrals in Cylindrical Coordinates Triple Integrals in Spherical Coordinates
8	July 19		Review and Catch up
Final Exam (Comprehensive) – Monday - July 20, 2020			

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, 61, 63
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, 23, 31, 45
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, 45, 47, 55, 64.
12.4	1, 3, 5, 13, 14, 15, 17, 19, 27, 28, 29, 31, 33, 36, 37, 43, 44
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, 19, 23, 30, 32, 41, 43, 48
15.2	3, 5, 7, 9, 11, 15, 17, 19, 21, 25, 27, 29, 45, 50, 52, 55, 61
15.3	5, 8, 12, 13, 16, 19, 20, 26, 30, 33, 38
15.6	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, 24, 29
15.8	7, 9, 17, 19, 21, 22, 23, 29, 30, 35, 41, 43

Tips on how to enhance your problem-solving abilities

- ✓ Do all homework assignments on time.
- ✓ Practice (but not memorize) more problems than those in the above list.
- ✓ Solve some of review problems available in 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 online class.
- ✓ Practicing homework problems and reviewing the class lectures will make exam problems easier to tackle.
- ✓ Visit your instructor in his online office hours. Always bring partial solution of the questions that you want to discuss with your instructor.