King Saud University
Department of Mathematics
Syllabus of
MATH 228, Second semester 1443 H

Course code: MATH 228
Course title: Integral Calculus
Pre-Requisite: Math 218

Instructor: Aymen Ben Amira
Room AA 129/2, Building 4, Mathematics Department.

Text Book:

- J. Stewart, L. Redlin and S. Watson, Precalculus, Mathematics for Calculus, Cengage Learning, 7th edition, 2015.
- J. Stewart, Calculus: Early Transcendentals, 8th Edition, Cengage Learning, 8th edition, 2015.

Course Description

Math 228 is a 4-credits integral calculus course that comes in continuation to Math 218, differential calculus. The course covers topics on indefinite and definite integrals, properties, applications, techniques of integration. Infinite, power, and Taylor series. Function of several variables, differentiation, double and triple integrals.

Course objectives

Upon completion of Math 228, the students will be able to solve indefinite and definite integrals using appropriate analytical and/or numerical techniques. They will be able to use integral calculus in engineering applications. They will be able to apply the concept of functions of several variables, partial derivatives, and multiple integrals in various coordinate systems and how to compute them. They will be able to represent functions by power series.

Course content

Week #	Topics
1-2	Anti-derivatives and indefinite integrals, Table of known indefinite integrals, the definite integral and the fundamental theorem of calculus.
3	Area between curves, Volumes of a surface of revolution (cylindrical shell and disks methods).
4-6	Integration by substitution, Integration by parts, trigonometric integrals, integration of rational functions, improper integrals.
7-10	Functions of several variables, partial derivatives, maximum and minimum values, double integrals over rectangles, double integrals over general regions, double integrals in polar coordinates, Triple integrals, triple integrals in cylindrical coordinates, triple integrals in spherical coordinates.
11-14	Sequences and series, arithmetic sequences, geometric sequences, the Binomial theorem. Infinite series, convergence tests of positive term series (the comparison test, the integral test, the ratio and root tests), alternating series, absolute convergence.
14-15	Power series, radius of convergence, Taylor series, representations of functions by power series.

Homework assignments:

Grading	Percentage	Date of the test
Midterm Exam 1	25%	22/03/2022
Midterm Exam 2	25%	19/04/2022
Tutorial	10%	weekly
Final Exam	40%	13/06/2022
Total (100)	**100%**	