

## Subject Descriptions

Subject Code	MATH 206
Subject Name	Calculus II for Engineers
Credit Hours	4
Level of Study	2
Pre-Requisites	MATH 110
Faculty	Science

### Subject Description

This course deals mainly with Integral Calculus, which covers the following basic topics of intergrals with applications: Definite and indefinite integrals, Techniques of integration, Applications (Area between curves, Volume, Arc Length, Surface Area), Calculus of Parametric and Polar curves with Applications, Infinite Sequences and Series including power series and Function presentation as a Powers series.

### Subject Aims

- To observe a connection between differential and integral calculus; to study various types of integrals; and to study some important applications of integrals for Engineers.
- To study the knowledge of calculating the volume of solids, lengths of plane curves, area of the surface of revolution and work done by a varying force, including centroid of a bounded region by means of definite integrals.
- To study the comparison between catresian, parametric and polar corves; then to study calculus of parametric and polar cures including basic applications.
- To study the evaluation of various types integrals using different techniques and integral formulas.
- To study proper and improper integrals; and to study the convergence /divergence of improper integrals with connection to convergence/ divergence of infinite series.
- To study the convergence and divergence of infinite sequences and series leading to find the radius and interval of convergence of power series. Further, to study representation of functions as power series; including the Taylor. Maclaurin and Binomial series.

### Intended Learning Outcomes

- To achieve the concept of indefinite integral as anti-derivative; to differentiate between definite, indefinite and improper integrals and their evaluations; to learn some basic techniques for solving such integrals depending on various types of functions including rational functions and trigonometric functions.
- To achieve a knowledge of applying the definite integrals in order to calculate areas, volumes, length of curves, surface areas, centroid of bounded regions. to solve basic Engineering problems related to either definite or indefinite integrals.
- Be able to handle the Calculus of parametric curves and polar curves.
- Be able to obtain the convergence/divergence of infinite sequences and series using proper tests.
- Be able to obtain radius and interval of convergence of power series.
- Be able to obtain power series for various type functions.

### Teaching Details

Class lectures (supported by lecture notes, short quizzes during lectures including groups discussions).

### Assessment Details

	Percentage Formal assessment
First Exam	25%
Second Exam	25%
Final Exam	40%
In-course Assessment	10%
Total Percentage	100%

### Teaching Schedule and Support for Students

	Hours
Lecture	65
Tutorial	14
Practical	0
Office hours	6 hr/week
Academic Advising	5 hr/week

### Textbook Information

Author	Date	Title	Edition	Publisher
James Stewart	2015	Calculus, Early Transcendentals, International Metric Version	8th	Brooks/ Cole publishing Company, California