GMA S4 01
Exam. Code : MAE 4A

Integral Calculus and Differential Equations

COURSE - IV

MATHEMATICS

BLOCK - 1

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

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COURSE INTRODUCTION

‘Integral Calculus and Differential Equations’ is the fourth course of the programme B. A Mathematics (pass). The course is divided into two blocks.The first block consists of six units and second block consists of eight units.

Block 1 deals with the introduction of indefinite and definite integration. Reduction formulae of various integration are discussed in this block. Application of integrations are also been introduced in this block.

Block 2 deals with the basic concept of differential equation. Different methods of solution of first order and first degree differential equation are also introduced in this block. Concept of first order and higher degree differential equation is also covered in this block. Solution of linear differential equation of higher order with constant coefficient and homogeneous differential equations are also introduced in this block. Concept of linear partial differential equation and its solution will also be discussed in this block.

BLOCK INTRODUCTION

This is the first block of the course “Integral Calculus and Differential Equations”. The block consists of six units.

In Unit 1, the basics of the Integral calculus are introduced. In this unit, we will discuss different methods of Integration.

In Unit 2, we will discuss about definite integrals and the properties of definite integrals.

In Unit 3, we will derive some reduction formulae of integrations.

In Unit 4, we will discuss quadrature of plane areas.

In Unit 5, we will discuss rectification of plane curves.

In Unit 6, we will discuss volume of revolution and surface of revolution.

While going through a unit, you will notice some along-side boxes, which have been included to help you know some of the difficult, unseen terms. Some ‘ACTIVITY’ (s) has been included to help you apply your own thoughts. Again, we have included some relevant concepts in ‘LET US KNOW’ along with the text. And, at the end of each section, you will get ‘CHECK YOUR PROGRESS’ questions. These have been designed to self-check your progress of study. It will be better if you solve the problems put in these boxes immediately after you go through the sections of the units and then match your answers with ‘ANSWERS TO CHECK YOUR PROGRESS’ given at the end of each unit.

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		Pages
UNIT 1 :	**Integration and Methods of Integration** Intregration of Simple Functions, Properties of Indefinite Integrals, Methods of Integration : Integration by Substitution, Integration by Parts, Integration by Partial Fractions.	**7 - 65**
UNIT 2 :	**Definite Integrals** Definite integral– Integration as the Limit of a Sum; Fundamental Theorem of Integral Calculus; Summation of Series with the help of Integration; Evaluation of Definite Integrals by Using Properties.	**66 - 102**
UNIT 3 :	**Reduction Formulae** Reduction Formulae : Reduction formulae for (i) $\int \sin^n x dx$, and (ii) $\int \cos^n x dx$, n being a positive integer, Reduction Formulae for (i) $\int \tan^n x dx$ and (ii) $\int \cot^n x dx$, n being a positive Integer, Reduction Formula for $\int x^n e^{ax} dx$, where n be a posititve Integer, Reduction Formula for $\int \cos^m x \sin x dx$.	**103 - 121**
UNIT 4 :	**Quadrature of Plane Areas** Quadrature of Plane Curves : Area Between Two Given Curves.	**122 - 140**
UNIT 5 :	**Rectification of Plane Curves** Rectification of Plane Curves.	**141 - 152**
UNIT 6 :	**Volume of Revolution and Surface of Revolution** Volume of Solids of Revolution; Surface of Solids of Revolution.	**153 - 170**