UG MA S4-01
(DSE)

FOUR YEAR BACHELOR'S DEGREE COURSE

(CBCS in Accordance with NEP 2020)

SEMESTER IV

INTEGRAL CALCULUS AND DIFFERENTIAL EQUATIONS

MATHEMATICS

Hiranya Chandra Bhuyan School of Science and Technology
KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

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COURSE INTRODUCTION

'Integral Calculus and Differential Equations' is the fourth discipline specific elective (DSE) course of the programme in Mathematics. This course consists of fourteen 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.

In Unit 7 introduces fundamental concepts differential equation.

In Unit 8 deals with the solution of first order and first degree ordinary differential equation.In this unit, we will discuss different methods for solving first order and first degree ordinary differential equation.

In unit 9, we will introduce you to exact differential equation of first order and first degree.In this unit, we will discuss different methods for solving exact differential equation of first order and first degree.

In Unit 10 covers the solution of first order and higher degree differential equation.Clairaut's form is also explored in this unit.

In Unit 11 begins with introduction of linear differential equation of higher order.Solution procedure for linear differential equation of higher order is discussed in this unit.

In unit 12, we will linear homogeneous differential equation of higher order.Method of variation is also included in this unit.

Unit 13 deals with partial differential equation and its formation.

In unit 14, we will discuss solution of first order and first degree partial differential.

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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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**
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Differential Equation of First Order and First Degree; Variable Separable Method; Homogeneous Differential Equation : Equations Reducible to Homogeneous form; Linear Differential Equation; Bernouli's Equation.

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Linear Differential Equations with Constant Coefficients : Rules of Finding Complementary Function, Methods of Finding Particular Integral.

UNIT 12 : Linear Homogeneous Differential Equation of Higher Order **323-338**

Linear Homogeneous Equation : Equation Reducible to Homogeneous form; Method of Variation of Parameters.

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Solution of first order and first degree partial differential equation.