COURSE OUTCOME

DEPARTMENT OF MATHEMATICS

CALCULUS & GEOMETRY

Course : BMH1CC01

Unit -1: Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications to prob-lems of type eax+bsinx;eax+bcosx;(ax + b)nsinx;(ax + b)ncosx, concavity and inection points, envelopes, asymptotes, curve tracing in Cartesian coordinates, tracing in polar coordinates of stan-dard curves, LHospitals rule, applications in business, economics and life sciences.

Unit-2 : Reduction formulae, derivations and illustrations of reduction formulae for the integration of sinnx;cosnx;tannx;secnx;(logx)n;sinnxsinmx, parametric equations, parametrizing a curve, arc length, arc length of parametric curves, area of surface of revolution. Techniques of sketching conics.

Unit -3: Reection properties of conics, translation and rotation of axes and second degree equa-tions, classication of conics using the discriminant, polar equations of conics. Spheres.Cylindrical surfaces. Central conicoids, paraboloids, plane sections of conicoids, Generating lines, classication of quadrics, Illustrations of graphing standard quadric surfaces like cone, ellipsoid.

Name and Designation of the Teacher:

Dr. Debaprasad Ghosh, Associate Professor in Mathematics

On completion of this course students will be expected to

I be able to recognize hyperbolic functions and sketch their graphs,

I know higher order derivatives, Leibnitzs rule to nd higher order derivatives on product of two functions and its applications, to problems of types eax+bsinx;(ax+b)ncosx etc

I be able to determine concavity and inection points, envelopes, asymptotes,

I be able to curve tracing in Cartesian co-ordinates system and polar co-ordinate system of stan-dard curves,

I be able to evaluate limits in indeterminate forms by repeated use of LHospitals rule,

I know application of derivatives in business, economics & life science.

CALCULUS & GEOMETRY

I nd reduction formulae, derivatives and illustration of reduction formulae for the integration of sinnx;cosnx;tannx;secnx;sinnxcosmx;(logx)n

I be able to determine arc length of curves and area of surface of revolution I know techniques of sketching conics

I know reection properties of conics, translation and rotation of axes and second degree equation I be able to classication of conics using determinant and to nd polar equations of conics

I know spheres, cylindrical surfaces central conicoids, paraboloids, plane sections of conicoids, generating lines and classication of quadratics in Cartesian co-ordinates,

I be illustrate of graphing standard quadratic surfaces like cone, ellipsoid

I be able to sketching ellipsoid, hyperboloid of one and two sheets, elliptic cone, elliptic paraboloid and hyperbolic paraboloid using Cartesian co-ordinates.

ABSTRACT ALGEBRA AND NUMBER THEORY

Course : BMH1CC02

Unit -2 : Equivalence relations and partitions, Functions, Composition of functions, Invertible

functions, One to one correspondence and cardinality of a set. Well-ordering property of positive

integers, Division algorithm, Divisibility and Euclidean algorithm.Congruence relation between in-

tegers.Principles of Mathematical Induction, statement of Fundamental Theorem of Arithmetic.

Name and Designation of the Teacher:

Dr. Pulak Samanta, Associate Professor in Mathematics

After completion of the course students will be able to

I Understand denition of a relation, Various types of relations, equivalence relation, equivalence

class, partition of set, interconnection between equivalence relation and partition.

I Understand denition of a function, Dierence between relation and function, how to dene and

form Composition of functions, denition of Invertible functions, equipotent sets and cardinality of a set.

I Understand basic Well-ordering principle of positive integers, Division algorithm with the help

of Well-ordering principle, divisibility of integers and related theorems, Euclidean algorithm and

its applications, concept of Congruence relation between integers. Principles of Mathematical

Induction and related simple problems, statement of Fundamental Theorem of Arithmetic.

DIFFERENTIAL EQUATIONS

Course : BMH1CC01

Unit -4 :Dierential equations and mathematical models. General, particular, explicit, implicit

and singular solutions of a dierential equation.Exact dierential equations and integrating factors,

separable equations and equations reducible to this form, linear equation and Bernoulli equations,

special integrating factors and transformations

Name and Designation of the Teacher :

Dr. Kanchan Jana, Associate Professor in Mathematics

After completion of the course students will be able to

I Distinguish between linear, nonlinear, partial and ordinary dierential equations.

I Concept of General Solution and singular solution of a rst order ordinary dierential equation

order ODEs and use the theorem to determine a solution interval.

I Recognize and solve a variable separable ordinary dierential equation.

I Recognize and solve a homogeneous ordinary dierential equation.

I Recognize and solve an exact ordinary dierential equation of rst order and rst degree.

I Recognize and solve a linear ordinary rst order dierential equation.

I Recognize and solve equations of Bernoulli.

I Recognize and solve special integrating factors and transformations.