Course Outcomes (CO) of Programme Course (CBCS)

Paper: BMTMCCRT 101 (CC1)

Title: *Calculus & Analytical Geometry (2D)*

Course Outcomes (CO): The whole course will have the following outcomes.

Upon successful completion of this course, students will be able to

CO1: solve tangent and area problems using concepts of limit, derivatives and integrals.

CO2: calculate higher order derivatives and find limit of functions which are of indeterminate form using L'Hospital's rule.

CO3: find the rate in which a curve curves, further to find Asymptotes of curves, envelopes etc.

CO4: find length of a curve & volume and surface area of revolution.

CO5: understand the transformation rule of rectangular axes.

CO6: acquire knowledge on angle between pair of straight lines, bisectors etc. acquire concepts of poles and polar.

CO7: find polar equations of straight line, circle and conics.

Paper: BMTMCCRT 201 (CC2)

Title: *Ordinary Differential Equations & Linear Algebra*

Course Outcomes (CO): The whole course will have the following outcomes.

Upon successful completion of this course, students will be able to

CO1: solve first order differential equations utilizing the standard techniques for exact, linear, homogeneous, or Bernoulli cases.

CO2: solve first order nonlinear differential equations using the standard techniques and get an idea of singular solution.

CO3: find the complete solution of a non-homogeneous differential equation as a linear combination of the complementary function and a particular solution.

CO4: find the complete solution of a differential by variation of parameters.

CO5: solve the Pfaffian and simultaneous equations with constant coefficients.

CO6: have a working knowledge of basic application problems described by second order linear differential equations.

CO7: acquire basic knowledge in vector spaces.

CO8: solve linear systems represented as matrix equations.

Paper: BMTMCCRT 301 (CC3)

Title: *Analytical Geometry (3D) & Vector Analysis*

Course Outcomes (CO): The whole course will have the following outcomes.

Upon successful completion, student will be able to

CO1: understand the three-dimensional geometry of planes, straight lines, spheres, cones and cylinders.

CO2: acquire knowledge of cylindrical and spherical coordinates. Obtain the product of three or more vectors.

CO3: analyse the concepts limit and continuity and differentiability of vector valued functions.

CO4: calculate line, surface and volume integrals.

CO5: apply Green, Gauss and Stoke's theorems in finding various integrals.

Paper: BMTMSERT 304 (SEC 1)

Title: *Logic & Sets*

Course Outcomes (CO): The whole course will have the following outcomes.

Upon successful completion of this course, the students will be able to

CO1: distinguish different kinds of logical statements.

CO2: determine logical equivalence of two statements.

CO3: acquire basic knowledge about set theory.

CO4: acquire knowledge about relation.

Paper: BMTMCCRT 401 (CC4)

Title: *Laplace Transformation & Tensor Analysis*

Course Outcomes (CO): The whole course will have the following outcomes.

Upon successful completion of this course the students will be able to

CO1: understand the ideas and importance of Laplace transforms that are used to map one domain into another in which the problem is simpler to analyze (e.g., solving a linear differential equation).

CO2: acquire knowledge about change in coordinate system.

CO3: gather basic operations on tensors.

CO4: acquire knowledge about Riemannian space.

CO5: know covariant and contravariant differentiation; Christoffel symbols.

Paper: BMTMSERT 404 (SEC 2)

Title: *Graph Theory*

Course Outcomes (CO): The whole course will have the following outcomes: After successful completion of the course, students will be able to

CO1: define and relate basic notions in graph theory.

CO2: apply algorithms and theorems from graph theory on solving problems.

CO3: structure and solve real work problems by tools from discrete mathematics and graph theory working in teams.

Paper: BMTMDSRT 1(DSE 1)

Title: *Linear Programming Problem*

Course Outcomes (CO): The whole course will have the following outcomes:

CO1: solve linear programming problems (LPP) using appropriate techniques and optimization solvers, interpret the results obtained.

CO2: determine optimal strategy for Minimization of Cost of shipping of products from source to Destination/ Maximization of profits of shipping products using various methods.

CO3: find the initial basic feasible and optimal solution of the LPP and Transportation problems.

CO4: optimize the allocation of resources to Demand points in the best possible way using various techniques and minimize the cost or time of completion of number of jobs by number of persons.

Paper: BMTMDSRT 2 (DSE 2)

Title: *Mechanics-I*

Course Outcomes (CO): The whole course will have the following outcomes:

Upon successful completion, the students will be able to

CO1: determine resultant of various force systems.

CO2: determine centroid, moment of inertia and solve problems related to them.

CO3: determine positions of equilibrium and conditions of equilibrium using principles of virtual works.

CO4: solve the mathematical moving models under the action forces in two dimensional spaces.

Paper: BMTMSERT 504 (SEC 3)

Title: *Numerical Methods*

Course Outcomes (CO): The whole course will have the following outcomes:

Upon successful completion, the students will be able to

CO1: Understand the concepts of approximation and round-off errors, including the significance of decimal places and significant figures.

CO2: understand the theoretical and practical aspects of the use of numerical analysis.

CO3: derive numerical methods for various mathematical operations and tasks, such as interpolation techniques, integration, the solution of linear and nonlinear equations, and the solution of ordinary differential equations.

CO4: understand of common numerical analysis and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.

CO5: establish the limitations, advantages, and disadvantages of numerical analysis.

CO6: proficient in implementing numerical methods for a variety of multidisciplinary applications.

Paper: BMTMDSRT 3 (DSE 2)

Title: *Probability & Statistics*

Course Outcomes (CO): The whole course will have the following outcomes:

Upon successful completion, the students will be able to

CO1: calculate the expectation and moments of one- and two-dimensional random variables.

CO2: use of some important one dimensional discrete and continuous distributions and their basic properties.

CO3: learn the concept correlation and regression

CO4: explain the concept of convergence and check for the of convergence of a given sequences of random variables. CO5: find the expressions for the characteristic function of a random variable and verify its properties.

CO6: apply the various laws of large numbers to sequences of random variables.

CO7: understand the basic components of sampling and have the knowledge on exact sampling distributions which are essential for estimating and testing hypothetical statements.

CO8: find a best estimator with reference the different criteria in case of real-life applications. Understand critically the problems that are faced in testing of a hypothesis.

CO9: apply the different testing tools like t-test, chi-square test etc. to analyze the real-life problems.

Paper: BMTMDSRT 4 (DSE4)

Title: *Mechanics-II*

Course Outcomes (CO): The whole course will have the following outcomes:

Upon successful completion, the students will be able to

CO1: determine the tension of a string or thrust of a rod joining in a framework by principles of virtual works.

CO2: solve the mathematical moving models under the action forces in three dimensional spaces.

CO3: describe the physical properties of a fluid and calculate hydrostatic characteristics for a given floating structure.

CO4: calculate the pressure distribution for incompressible fluids and compute the hydrostatic pressure and force on plane and curved surfaces.

CO5: provide a mathematical framework to analyze the behavior of materials at macroscopic length, time and energy scales.

CO6: express the deformation and related stresses.

CO7: get an idea about the homogeneous, isotropic, continuous materials modelled as a continuous mass rather than as discrete particles.

Paper: BMTMSERT 604 (SEC 4)

Title: *Basic Computer Programming in C*

Course Outcomes (CO): The whole course will have the following outcomes:

Upon successful completion, the students will be able to

CO1: understand the basics of computer programming in C, including different computer languages, Boolean algebra, and the binary number system.

CO2: write C programs using fundamental programming structures such as variables, operators, conditional statements (IF, IF-ELSE, LADDER, SWITCH), loops (DO, WHILE-DO, FOR), and arrays (one and two dimensions). CO9: apply programming techniques to solve statistical problems and other simple programming tasks. CO10: have a solid foundation in numerical methods, computer programming in C, and their applications in solving mathematical problems.

Course Outcomes (CO) of Generic Elective Course (GE) (CBCS)

Paper: BMTMGEHT 10

Title: *Basic of higher Mathematics-I*

Course Outcomes (CO): The whole course will have the following outcomes: Upon successful completion, students will be able to

CO1: learn concepts of complex numbers, De' Moivre's theorem and its application.

CO2: find number of real (positive & negative) and complex roots of algebraic equations using Descarte's rule and learn the methods to solve cubic equations.

CO3: solve linear systems of equations.

CO4: find eigen values and eigen vectors of a square matrix.

CO5: calculate higher order derivatives and find limit of functions which are of indeterminate form using L'Hospital's rule.

CO6: compute partial derivatives of functions of several variables.

CO7: acquire knowledge about homogeneous functions.

CO8: analyse the concepts limit and continuity and differentiability of vector valued functions.

CO9: compute curl and divergence of vector functions; gradient and directional derivative of scalar functions.

Paper: BMTMGEHT 10A

Title: *Basic of Higher Mathematics-II*

Course Outcomes (CO): The whole course will have the following outcomes: Upon successful completion, students will be able to

CO1: acquire basic idea about groups, rings and fields.

CO2: acquire knowledge on angle between pair of straight lines, bisectors etc.

CO3: find polar equations of straight line, circle and conics.

CO4: understand the three-dimensional geometry of planes, straight lines and spheres.

CO5: compute integrals using reduction formulae

CO6: compute length, area of a plane curve; volume of a surface of revolution.

CO7: solve first order differential equations utilizing the standard techniques for exact, linear, homogeneous, or Bernoulli cases.

CO8: solve first order nonlinear differential equations using the standard techniques and get an idea of singular solution.