Course Outcome of B. Sc. Mathematics

(1) Course Outcome of Differential Calculus and Integral Calculus :-

Students will able to

I. Solve Limits and Continuity by using $\varepsilon \; and \; \delta$ Definition.
II. To understand types of discontinuities.
III. Understand Successive differentiation and solve problems by using Leibniz theorem.
IV. Apply Mean Value theorem(MVT), Rolle's Theorem and Cauchy's Mean Value theorem(CMVT).
V. Solve Problems on Taylors Series and Maclaurin's Series of Sinx, Cosx, e , $\log(1 + x)$, $(1 + x)^m$.
VI. Illustrate Improper integral, Gamma function and its properties.

(2) Course Outcome of Differential Calculus and Trigonometry:-

Students will able to

I. Understand the Limit and Continuity for function of two variables.
II. Lagrange's Multiplier method .
III. De Moivre's theorem and its applications.
IV. Expand $\cos^n\theta$, $\sin^n\theta$ and $\tan^n\theta$ in terms of θ.
V. Define hyperbolic functions and inverse hyperbolic functions.

(3) Course Outcome of Differential Equations and Difference Equations:-

Students will able to

I. Understand First order Exact Differential Equation.
II. Understand Linear differential equations and solve problems on Bernoulli's equations.
III. Find a solution of differential equations of the first order and of a degree higher than the first by using methods of solvable for p, x and y.
IV. Compute complementary function and particular integral of differential equations..
V. Compute all the solutions of second and higher order linear differential equations with constant coefficients, linear equations with variable coefficients.
VI. Solve simultaneous linear equations with constant coefficients and total differential equations.

VII.

(4) Course Outcome of Partial Differential Equations:-

Students will able to

I. Formation of partial differential equations.
II. Solve linear partial differential equation of first order.

III. Homogeneous partial differential equations and its applications.
IV. Solve problems by using Jacobbi's method.
V. Non-Homogeneous differential equations.

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(5) Course Outcome of Real Analysis:-

Students will able to

I. Define different types of real sequence, bounded sequence, Cauchy Sequence.
II. Verify the given sequence in convergent and divergent by using behavior of Monotonic sequence.
III. Discuss the behavior of the geometric series.
IV. Verify the given series is convergent or divergent by using different test.
V. Define and recognize the concept of metric spaces, open sets, closed sets,
VI. Define and Illustrate the concept Riemann Integrals.

(6)Course Outcome of Set Theory and Laplace Transform:-

Students will able to

a. Understand set theory.
b. Determine Countable anduncountable sets
c. Define fuzzy sets, α-cuts, fuzzy complements.
d. Illustrate fuzzy relations, binary fuzzy relations, fuzzy equivalence relations.
e. State some applications of fuzzy sets.
f. Understand Laplace transform and Inverse Laplace transform.
g. Apply Laplace transform to solve ODE and PDE.

(7)Course Outcome of Algebra:-

Students will able to

a. Define Group ,subgroup, center, Normalizer of a subgroup.
b. Prove Lagrange's theorem .
c. Define cyclic groups .
d. Define homomorphism ,kernel of a homomorphism, isomorphism.
e. Define rings , zero divisors of a ring , integral domain , field and prove theorem.

(8)Course Outcome of Elementry Number Theory:-

Students will able to

I. Illustrate Divisibility, Division and Euclidean Algorithm.
II. Describe the properties of prime numbers.
III. Define congruence's and describe the properties of congruence's.
IV. Solve the system of linear congruence's.
V. State Chinese Remainder Theorem, Fermat's and Wilson's theorem and GoldbachConjuncture.

(9)Course Outcome of Linear Algebra :-

Students will able to

I. Define Vector Space, Quotient space Direct sum, linear span and linear independence, basis and inner product.
II. Illustrate Dual Space,Bi dual space and natural Isomorphism.
III. Prove Schwartz inequality, Gram-Schmidt orthogonalisation process.

(10)Course Outcome of Mechnics :-

Students will able to

I. Define Kinematics in two dimensions.
II. Define Simple Hormonic Motion and find its Geometrical representation.
III. Find the Composition of SHM and the differential equation of a centralorbit.
IV. Find the law of force if the orbit is given and vice versa.

(11)Course Outcome of Matrices and Theory of Equations :-

Students will able to

I. Illustrate Symmetric and Skew symmetric, Hermition and Skew Hermition Matrices.
II. Learn Linear equations and various methods to solve linear equations.
III. Define characteristic equation of matrices and illustrate.
IV. State Cayley Hamilton Theorem and its applications.
V. Find Eigen values and Eigen vectors of a given matrix.
VI. Find the sum of the power of the roots of an equation using Newton's Method.
VII. Solve the reciprocal equations.

(12)Course Outcome of Numerical Methods:-

Students will able to

I. Define Basic concepts of operators Δ, E, ∇
II. Derive Gauss's formula and Stirling formula using Newton forward formula and Newton backward formula.
III. Find maxima and minima for differencial difference equation
IV. Derive Simpson's 1/3 ,3/8 rules using trapezoidal rule
V. Find the summation of series finite difference techniques

(13)Course Outcome of Complex Analysis and Vector Calculus :-

Students will able to

a. Compute sums, products, quotients, conjugate, modulus, and

argument of complex numbers.

b. Calculate exponentials and integral powers of complex numbers.
c. Understand the significance of differentiability for complex functions and be familiar with the Cauchy-Riemann equations.
d. Define Bilinear transformation, cross ratio, fixed point.
e. Write the bilinear transformation which maps real line to real line, unit circle to unit circle, real line to unit circle.
f. Use Cauchy's integral theorem and formula to compute line integrals.
g. Represent functions as Taylor, power and Laurent series.
h. Find residues and evaluate complex integrals, real integrals using the residue theorem.
i. Understand Vector Differentiation .

(14)<u>Course Outcome of Linear Programmig and Transportation Problem :-</u>

Students will able to

a. Define nature and feature of Operations Research.
b. Formulate LPP by graphical method and its applications.
c. Define basic feasible solutions, Slack and Surplus variable.
d. Explain simplex method.
e. Demonstrate Big-M method
f. Illustrate two phase method
g. Prove dual of the dual is primal.
h. Interpret dual simplex method.
i. Define transportation problem.
j. Find a basic feasible solution to the transportation problem by using North west corner rule, Vogel's approximation method.

<u>Programme Specific Outcome of B.Sc., Mathematics</u>

II. Think in a logical and critical manner.
III. Know when there is a need for information, to be able to identify, locate, evaluate, andeffectively use that information for the issue or problem at hand.
IV. Formulate and develop real life Mathematical problems in a logical manner.
V. Acquire good knowledge and understanding in advanced areas of Mathematics, chosenby the student from the given courses.