

DEPARTMENT OF MATHEMATICS

Programme Outcomes

PO1. Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself; demonstrate the ability to listen carefully, read and write analytically and present complex information in a clear and concise manner to different groups.

PO2. Critical Thinking: Capability to apply analytic thought to a body of knowledge; analyze and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.

PO3. Problem Solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge and apply one's learning to real life situations.

PO4. Analytical reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples and addressing opposing viewpoints.

PO5. Cooperation/Team work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.

PO6. Scientific Reasoning: Ability to analyze, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.

PO7. Information/digital Literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.

PO8. Moral and Ethical awareness/reasoning: Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives and use ethical practices in all work. Capable of demonstrating the ability to identify ethical issues related to one's work, avoid unethical behavior such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.

PO9. Leadership readiness/qualities: Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.

PO10. Lifelong Learning: Ability to acquire knowledge and skills, including learning how to learn, that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives and adapting to changing trades.



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Programme Specific Outcomes

PSO1: Apply computational & algorithmic versions to solve real life problems.

PSO2: Analyze & apply mathematical arguments in a logical & critical manner.

PSO3: Investigate and apply mathematical problems and solutions in a variety of contexts related to science, technology, business and industry, and illustrate these solutions using symbolic, numeric, or graphical methods.

PSO4: Demonstrate proficiency in writing proofs.

PSO5: to develop a positive attitude towards Mathematics as an interesting and valuable subject of study.

PSO6: Develop mathematical ideas both orally and in writing.

Course Outcomes: BMDSC1T Algebra-I and Calculus-I

SI NO.	Outcome Statement	PO/PSO	Cognitive Level
C01	Learn to solve system of linear equation.	PO1,PO4 PSO2	K1
C02	Understand system of homogeneous and non homogeneous by using concept of rank of matrix.	PO6, PO7, PSO4	K2
C03	Analyze techniques of integration and Differentiation of function with real variables.	PO10, PO3 PSO2	K4
C04	Identify and apply the intermediate value theorems and L' Hospitals rule.	PO3,PO10 PSO3	K2
C05	Apply the idea of differentiation from first principles.	PO10,PSO1	K3

Course Outcomes: BMDSC2T Real Analysis-I and Calculus-II

SI NO.	Outcome Statement	PO/PSO	Cognitive Level
C01	Understand the fundamental properties of the real numbers that lead to define sequence and series, the formal development of real analysis.	PO3,PSO3	K2
C02	Learn the concept of convergence and divergence of a sequence.	PO2,PSO1	K3
C03	Able to handle and understand limits and their use in sequences, series, differentiation, and integration.	PO2,PSO5	K2
C04	Apply the ratio, root, alternating series, and comparison tests for convergence absolute convergence of an infinite series.	PO6,PSO5	K3
C05	Recall the extreme values of function of two variables	PO7,PSO2	K1

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Course Outcomes: BMDSC3T ALGEBRA –II CALCULUS-III and REAL-ANALYSIS –II

SI NO.	Outcome Statement	PO/PSO	Cognitive Level
C01	Remember the significant notion of groups and Subgroups.	PO1,PO7, PS04	K1
C02	Determines whether a given set and binary operation form a group by checking group axioms.	PO2, PO3, PS03	K4
C03	Analyze consequences of Lagrange's theorem and describe about structure preserving maps between groups and their consequences.	PO6, PO4, PS02	K4
C04	Understand the concepts of differential and fundamental theorems in differentiation And various rules.	PO3, PO5, PS04	K2
C05	Sketch curves in Cartesian, polar and pedal equations	PO8,PO5 PS01, PS06	K6

Course Outcomes: BMDSC4T Differential Equations

SI NO.	Outcome Statement	PO/PSO	Cognitive Level
C01	To provide knowledge on solving order ordinary differential equations.	PO2,PSO2	K4
C02	Understand the formation of modeling problems in ordinary differential equations and apply some standard methods to obtain its solutions.	PO3,PSO5	K2
C03	Obtain an approximate set of solution function values to a second order boundary value problem using a finite difference equation.	PO7,PSO3	K3
C04	To Recognize the Formation of PDE by the elimination of arbitrary constants and arbitrary functions, solutions of Lagrange's linear PDE, First order non-linear PDE of the form $f(p,q)=0, f(p,q,z)=0, f(x,p)=g(y,q)$, clairaut's form	PO8,PSO2	K4
C05	To analyze approximate set of solution function values to a second order boundary value problem using a finite difference equation.	PO4,P10, PSO5	K4

Course Outcomes: BMDSE5CT Numerical Analysis_I

SI NO.	Outcome Statement	PO/PSO	Cognitive Level
C01	Acquire basic knowledge in solving interpolation with equal interval problems by various numerical methods. Estimate the missing terms through interpolation methods.	PO1,P07, PSO1	K3
C02	Develop skills in analyzing the methods of interpolating a given data, properties of interpolation with unequal intervals and derive conclusions, approximate a function using an appropriate numerical method	PO2,PO3, PSO2	K6
C03	Implement numerical methods for a variety of multidisciplinary applications and a variety of numerical algorithms using appropriate technology	PO3,PO9, POS3, POS5	K3
C04	How to make the difference table,relation between $n!$ & E ,Factorial notation at Factorial function.	PO1,PO8 POS5	K6
C05	To find the solution of linear systems by using Direct methods, Matrix inversion method, Gaussian elimination methods, Gauss-Jordan Method,	PO7, PO2 POS1	K2
C06	Create table using Newton's forward difference formula, Newton's backward difference formula, Derivatives using central difference formulae, Stirling's interpolation formula, Newton's divided difference formula	PO6,PO5 POS4	K6

Course Outcome: BMSEC5B Laplace Transforms

Sl. no	Outcome Statements	PO/PSO	Cognitive Level
1.	Basic concepts of Laplace transform and linearity Property.	PO1, PO4, PSO1	K1
2.	Apply the Laplace transform of some standard functions, properties and inverse Laplace transform.	PO3, PO6, PSO3	K3
3.	Understand the Computation of inverse Laplace transformation by partial fractions	PO8, PO2, PSO1	K2
4.	Develop the convolution theorem and related examples	PO5, PO2, PSO4	K6
5.	Evaluate the Applications of Laplace transform to solve differential equations up to second order.	PO10, PSO6	K5

Course Outcomes: BMDSE6CT Numerical Analysis_II

SI NO.	Outcome Statement	PO/PSO	Cognitive Level
C01	Acquire basic knowledge in solving interpolation with equal interval problems by various numerical methods. Estimate the missing terms through interpolation methods.	PO1,P07, PSO1	K3
C02	Implement numerical methods for a variety of multidisciplinary applications and a variety of numerical algorithms using appropriate technology	PO3,P09, PSO3, PSO5	K3
C03	Create table using Newton's forward difference formula, Newton's backward difference formula, Derivatives using central difference formulae, Stirling's interpolation formula,	PO6,P05 PSO1	K6
C04	Derive Trapezoidal rule, Simpson's 1/3 – rule, Simpson's 3/8 – rule, and Weddle's rules from General Quadrature formula	PO7, P05 PSO2	K3
C05	Apply find the solution of ordinary differential equation of first order by Euler, Taylor and Runge-Kutta methods	PO3, P10, PSO2 PSO6	K3
C06	Compare different methods in numerical analysis with accuracy and efficiency of solution	PO6, PO5 PSO2	K5

Course Outcome: BMSEC6B Fourier series and Harmonic Analysis

Sl. No	Outcome Statements	PO/PSO	Cognitive Level
C01	Develop the Fourier series of the period 2π and $2L$ (Arbitrary period).	PO3,PO1, PS02,PS01	K6
C02	Evaluate the Fourier series in terms of even and odd functions.	PO2, PO4,	K5
C03	Implement a half range Fourier series of sine and cosine terms.	PO7.PS06	K3
C04	Explain the inverse Fourier transforms	PO6	K2
C05	Examine the properties of Fourier transforms	PO3	K4
C06	Identify importance of applications of Fourier transform to solve differential equations	PO7,P10 PS04	K2

CO-PO Mapping

Courses / PO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
DSC1T Algebra- I and calculus-I	✓		✓	✓		✓	✓			✓
DSC1P Practical -1	✓		✓	✓		✓	✓			✓
DSC2T Real analysis- I and calculus-II	✓	✓	✓		✓	✓	✓			
DSC2P Practical -2	✓	✓	✓		✓	✓	✓			✓
DSC3T Algebra- II ,Real analysis-II and calculus-III	✓	✓	✓	✓	✓	✓	✓	✓		✓
DSC3P Practical -3	✓	✓	✓	✓	✓	✓	✓	✓		✓
DSC4T Differential equations		✓	✓	✓			✓	✓		✓
DSC4P Practical -4		✓	✓	✓			✓	✓		✓
DSE5CT Numerical analysis -I	✓	✓	✓		✓	✓	✓	✓	✓	✓
DSE5CP Practical -5(C)	✓	✓	✓		✓	✓	✓	✓	✓	✓
SEC5B Laplace Transforms	✓	✓	✓	✓	✓	✓		✓		✓
DSE6CT Numerical analysis -II	✓		✓		✓	✓	✓		✓	✓
DSE6CP Practical-6(C)	✓		✓		✓	✓	✓		✓	✓
SEC6B Fourier Series and Harmonic Analysis	✓	✓	✓	✓		✓	✓			✓

CO-PSO Mapping

Courses / PSO's	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
DSC1T Algebra- I and calculus-I	✓	✓	✓	✓		
DSC1P Practical -1	✓	✓	✓	✓		
DSC2T Real analysis-I and calculus-II	✓		✓		✓	
DSC2P Practical -2	✓		✓		✓	
DSC3T Algebra- II, Real analysis-II and calculus-III	✓	✓	✓	✓		✓
DSC3P Practical -3	✓	✓	✓	✓		✓
DSC4T Differential equations	✓		✓		✓	
DSC4P Practical -4	✓		✓		✓	
DSE5CT Numerical analysis -I	✓	✓	✓	✓	✓	
DSE5CP Practical -5(C)	✓	✓	✓	✓	✓	
SEC5B Laplace Transforms	✓		✓	✓		✓
DSE6CT Numerical analysis -II	✓	✓	✓		✓	✓
DSE6CP Practical-6(C)	✓	✓	✓		✓	✓
SEC6B Fourier Series and Harmonic Analysis	✓	✓		✓		✓