GOVT. SHIVALIK COLLEGE NAYA NANGAL
Department of Mathematics Session (2023-24)

Programme CODE :-

Programme OUTCOME :-

COURSE :- B. Sc. MATHEMATICS

Mathematical Knowledge

Familiarize the students with suitable tools of mathematical analysis to handle issues and problems in mathematics and related sciences. A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations , terminology.

Problem Solving Skills

This programme also offers training in problem solving skills.

Analytical & Logical thinking:-

Students should be able to apply their skills and knowledge that is translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.

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Department of Mathematics

COURSE OUTCOME

COURSE SPECIFIC OUTCOME

B.Sc. 1st Semester

S. No.	Course /Code	Outcome Semester I
1.	CACULUS (SCIB1101T)	• To apply notion of derivative in mean value theorem and also in higher order derivatives which arise in all applied sciences. • To study functions in detail which is a fundamental structure in all sciences, and to be able to check continuity of a function
2	LINEAR ALGEBRA and TRIGNOMETRY (SCIB1103T)	• To learn to find Eigen values and Eigen vectors of a matrix which is used in the study of vibrations, chemical reactions and geometry. • Understand the concept of vector spaces ,sub spaces, bases, dimension and their properties .

B.Sc. 2nd Semester

S. No.	Course /Code	Outcome Semester II
1.	Co-ordinate geometry (SCIB1201T)	• Relate matrices and linear transformation; compute Eigen values and Eigen vectors of linear transformation. • To learn analytical geometry of 2 and 3 dimensions which include study of conics, planes, lines, sphere, cone and cylinder
2.	DIFFERENTIAL EQUATIONS (SCIB1202T)	• Power series solution method using ordinary and singular points. • To understand the concept of Ordinary differential Equations in more than two variables. • Learn methods to solve first order Partial Differential Equations.

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COURSE OUTCOME

B.Sc. 3rd Semester

S. No.	Course /Code	Outcome Semester III
1.	ANALYSIS I (SCIB2301T)	• To study concept of sequence and series and hence find sum of infinite terms with different methods. • To study notion of lub and glb which helps to learn integrations which helps to find area under any functions
2.	NUMERICAL METHODS (SCIB2302T)	• Students can find divided difference ,forward , backward formula . • Students study various methods on bisection , regula falsi ,secant methods
3.	MECHANIC S (SCIB2303T)	• Statics: friction, work and energy, virtual work, • Dynamics: conservation of linear momentum, angular momentum and energy, variable mass systems, dynamic equilibrium.

B.Sc. 4th Semester

S. No.	Course / Code	Outcome Semester IV
1.	ANALYSIS II (SCIB2401T)	• To learn Riemann Integral and its properties in detail, leading to fundamental theorem of calculus and Mean value theorems. • To study pointwise and uniform convergence of sequences and series of functions.
2.	LINEAR PROGRAMMING (SCIB2402T)	• Understand the theory of the simplex method. And know about the relationships between the primal and dual problems, and to understand sensitivity analysis. • Learn about the applications to transportation, assignment and two-person zero-sum game problems.
3.	DYNAMICS (SCIB2403T)	. • Understand the kinds of motion, absolute and relative velocities and accelerations. • Learn about concurrent forces ,Lami's theorem ,centre of gravity.

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COURSE OUTCOME

B.Sc. 5th Semester

S. No.	Course /Code	Outcome Semester V
1.	MATHEMATICAL METHODS I (SCIB3501T)	• To learn to evaluate the Fourier series of various even and odd functions. • To learn the evaluation of Laplace transform of different types of functions, their derivatives and integrations
2.	ALGEBRA I (SCIB3502T)	• Understand the basic concepts of group actions and their applications. • Recognize and use the Sylow theorems to characterize certain finite groups. • Know the fundamental concepts in ring theory such as the concepts of ideals, quotientrings, integral domains, and fields
3.	DISCRETE I (SCIB3503T)	• Learn about partially ordered sets, lattices and their types. • Understand Boolean algebra and Boolean functions, logic gates, switching circuits and their applications

B.Sc. 6th Semester

S. No.	Course /Code	Outcome Semester VI
1.	MATHEMATICAL METHODS II (SCIB3601T)	• To learn the evaluation of Inverse Laplace transform of functions, their derivatives and integrations, and to learn application of Convolution theorem. • To learn to apply Laplace Transform to solve Ordinary Differential equations with constant coefficients.
2.	ALGEBRA II (SCIB3602T)	• Learn in detail about polynomial rings, fundamental • properties of finite field extensions, and classification of finite fields.
3.	DISCRETE II (SCIB3603T)	• Solve real-life problems using finite-state and Turing machines. • Assimilate various graph theoretic concepts and familiarize with their applications.

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TEACHING PLAN (SESSION 2022-2023)

NAME OF TEACHER:- Hemant Kumari **CLASS:- B.Sc I SEM(I)**

SUBJECT:- MATHEMATICS **PAPER :- CALCULUS**

Sr. No.	DATES (WEEKLY)	Topic which will be covered
1.	01Aug to 05 Aug	**Section A:** Properties of Real Numbers : order Property of real numbers **Test of above topic**
2.	07Aug to 12 Aug	Bounds, l.u.b and g.l.b . order completeness property of real numbers.
3.	14Aug to 19 Aug	Archimedian property of real numbers. Limits : definition of the limit of a function. **Power Point Presentation given to the students**
4.	21 Aug to 26 Aug	Basic properties of limits, Infinite limits, indeterminate forms.
5.	28 Aug to 02 sep	Continuity : Continuous functions, types of discontinuities. **Test of continuous function**
6.	04 Sep to 09 Sep	Sign of a function in a neighborhood of a point of continuity, intermediate value theorem.. **Power Point Presentation given to the students**
7.	11 Sep to 16 Sep	Maximum and Minimum value theorem. **Class Test**
8.	18 Sep to 23 Sep	**Section B :** Mean Value Theorems : Rolle's theorem ,Lagrange's mean value theorem . **Assignment given to the students (Rolle's &Lagrange's theorem)**
9.	25 Sep to 30 Sep	Cauchy's mean value theorem , their geometric interpretation and applications. **Test of above theorem**
10.	02 Oct to 07 Oct	Taylor's theorem and their applications. **Power Point Presentation**
11.	09 Oct to 14 Oct	Maclaurin's theorem with various form of remainders atheir applications. **Test of above topics**
12.	16 Oct to 21 Oct	Hyperbolic, inverse hyperbolic functions of a real variable and their derivatives. **Revise the topic**
13.	23 Oct to 28 Oct	Successive differentiation Leibnitz's theorem. **Test of above topics**
14.	30 Oct to 04 Nov	Continuity of composite functions , continuity of $\|f(x)\|$. **Test of above topics**
15.	06 Nov to 11 Nov	**M S T**
16.	13 Nov to 18 Nov	**Revise the whole syllabus and test of above topics**

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TEACHING PLAN (SESSION 2022-2023)

NAME OF TEACHER:- Hemant Kumari CLASS: B.Sc II SEM (III)

SUBJECT:- MATHEMATICS PAPER :- LINEAR PROGRAMMING & MECHANICS

Sr.No.	DATES (WEEKLY)	Topic which will be covered
1.	01Aug to 05 Aug	Linear Programming: Formation of LPP, Graphical Method. Theory of the Simplex Method, Standard form of LPP. **CLASS TEST OF ABOVE TOPIC**
2.	07Aug to 12 Aug	Feasible solution to basic feasible solution, Improving BFS, Optimality Condition, Unbounded solution.
3.	14Aug to 19 Aug	Alternative optimal solution, Correspondence between BFS and extreme points.
4.	21 Aug to 26 Aug	Simplex Method, Simplex Algorithm, Simplex Tableau.Simplex Method.Case of Degeneracy. **CLASS TEST OF ABOVE TOPIC**
5.	28 Aug to 02 sep	Big M Method, Infeasible solution, Alternate solution, Solution of LPP for unrestricted variable. **Power Point Presentation given to the students**
6.	04 Sep to 09 Sep	Transportation Problem: Formation of TP, Concepts of solution, feasible Solution
7.	11 Sep to 16 Sep	Finding Initial Basic Feasible Solution by North West Corner Method, Matrix Minima Method.
8.	18 Sep to 23 Sep	Vogel's Approximation Method.
9.	25 Sep to 30 Sep	Optimal Solution by MODI method Unbalanced and maximization type of TP. **Power Point Presentation given to the students**
10.	02 Oct to 07 Oct	Assignment Problem: Maximization, Minimization, Unbalances, With restriction Assignment problems, Algorithm, Hungarian methods. **Test of Above topic**
11.	09 Oct to 14 Oct	Statics: Basic notation, Newton Laws of motion, system of two forces, parallelogram law of forces.
12.	16 Oct to 21 Oct	resultant of two collinear forces, resolution of forces, moment of a force, couple.
15.	06 Nov to 11 Nov	Lami's theorem. Lemda -u theorem, theorems of moments, resultant of a force and a couple. Equilibrium conditions for coplanar non coplanar non.
16.	13 Nov to …… Nov	**MST and Revision of whole syllabus**

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TEACHING PLAN (SESSION 2022-23)

NAME OF TEACHER:- Hemant Kumari **CLASS: B.Sc III SEM (V)**

SUBJECT:- MATHEMATICS **PAPER :- MATHEMATICAL METHODS &DISCRETE I**

SR. No.	DATES (WEEKLY)	Topic which will be covered
1.	**07Aug to 12 Aug**	Existence of Laplace transform. Functions of exponential order and of class A. . **Test of Above topic**
2.	**14Aug to 19 Aug**	First and second shifting theorems of Laplace transform.
3.	**21 Aug to 26 Aug**	Change of scale property- Laplace transform of derivatives. . **Test of Above topic**
4.	**28 Aug to 02 sep**	Initial value problems, Laplace transform of integrals, Multiplication by 1. Division by Laplace transform of periodic functions and error function.
5.	**04 Sep to 09 Sep**	Beta function and Gamma functions. **Power Point Presentation given to the students**
6.	**11 Sep to 16 Sep**	Definition of Inverse Laplace transform, Linearity property, First and second shifting theorems of inverse Laplace transform, Change of scale property.
7.	**18 Sep to 23 Sep**	Division by p. Convolution theorem. . **Test of Above topic**
8.	**25 Sep to 30 Sep**	Heaviside's expansion formula (with proofs and applications) **Power Point Presentation given to the students**
9.	**02 Oct to 07 Oct**	Applications of Laplace transforms: Applications of Laplace transforms to the solution of ordinary differential equations with constant coefficients and variable coefficients.
10.	**09 Oct to 14 Oct**	Simultaneous ordinary differential equations.
11.	**16 Oct to 21 Oct**	Second order Partial differential equations (Heat Equation, Wave Equation and the Laplace equation). . **Test of Above topic**
12.	**23 Oct to 28 Oct**	Graphs and Planar Graphs-Basic Terminology Multi graphs.
15.	**30 Oct to 04 Nov**	Weighted Graphs. Paths and Circuits Shortest paths. Eulerian Paths and Circuits. **Power Point Presentation given to the students**
16.	**06 Nov to 11 Nov**	Travelling Salesman Problem. PlanarGraphs Trees. . **Test of Above topic**
17.	**13 Nov to….. Nov**	**M S T (Revision of whole syllabus)**