Vivekananda Degree College

Rajajinagar, Bangalore -55

Department of Mathematics

LESSON PLAN FOR THE ACADEMIC YEAR 2021-2022(NEP)

Program: BSc
Course/Paper Name: Mathematics
Semester: First Semester
Class: 1st Year B.Sc.

Total Hours 56

THEORY

Sl.No	Topic covered	No of lecture hours	Methodology	Date	Initials
	Algebra I –Matrix				
1.	Introduction and Recapitulation	1	Lecture + interaction	24/11/2021	CS
2.	Elementary row and column transformations	1	Blackboard + Lecture + Interaction	29/11/2021	CS
3.	Equivalent Matrices	1	Blackboard + Interaction	01/12/2021	CS
4.	Elementary Matrix	1	Blackboard + Interaction	02/12/2021	CS
5.	Row reduced echelon form of a matrix	1	Blackboard + Interaction	08/12/2021	CS
6.	Rank of a matrix , Some important results	1	Blackboard + Interaction	15/12/2021	CS
7.	Rank of a matrix by row reduction	1	Blackboard + Interaction	22/12/2021	CS
8.	Normal form	1	Blackboard + Interaction	29/12/2021	CS
9.	Linear equations	1	Blackboard + Lecture	05/01/2021	CS
10.	Homogeneous system of linear equations	1	Blackboard + Lecture	17/01/2021	CS
11.	Non-homogeneous system of linear equations	1	Blackboard + Lecture	19/01/2021	CS
12.	Condition for consistency	1	Blackboard + Lecture	02/02/2021	CS
13.	Solution by Gauss elimination method	1	Blackboard + Lecture	10/02/2021	CS
14.	Eigen values and Eigen vectors ,	1	Blackboard +	23/02/2021	CS

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	Relationship between Eigen values and Eigen vectors		Lecture		
15.	Caley-Hamilton theorem	1	Blackboard + Lecture	26/02/2021	CS
16.	Application Problems	1	Blackboard + Lecture	28/02/2021	CS
	Calculus I - Differential calculus				
1.	Introduction and Recapitulation	3	Lecture + interaction	02/11/2021 06/11/2021 08/11/2021	KRP
2.	Limits	1	Blackboard + Lecture	10/11/2021	KRP
3.	Continuity	2	Blackboard + Lecture	13/11/2021 15/11/2021	KRP
4.	Differentiability and properties	2	Blackboard + Lecture	17/11/2021 18/11/2021	KRP
5.	Properties of Continuous function	2	Blackboard + Lecture	25/11/2021 9/12/2021	KRP
6.	nth derivatives of standard function	2	Blackboard + Lecture	16/12/2021 23/12/2021	KRP
7.	Problems on nth derivative	3	Blackboard + Lecture	30/12/2021 06/01/2022 20/01/2022	KRP
8.	Leibniz's theorem	3	Blackboard + Lecture	27/01/2022 31/01/2022 31/02/2022	KRP
9.	Application Problems	1	Blackboard + Lecture	24/02/2022	KRP
	Mean Value Theorem				
1.	Intermediate Value Theorem	1	Blackboard + Lecture	23/11/2021	GK
2.	Rolle's Theorem	1	Blackboard + Lecture	30/11/2021	GK
3.	Lagrange's Mean Value Theorem (First Mean Value Theorem)	2	Blackboard + Lecture	07/12/2021 14/12/2021	GK
4.	Cauchy's Mean Value Theorem	2	Blackboard + Lecture	15/12/2021 21/12/2021	GK
5.	Taylors theorem	1	Blackboard + Lecture	28/12/2021	GK

6.	Problems on Taylors series expansion	2	Blackboard + Lecture	04/01/2021 11/01/2021	GK
7.	Problems on McLaurin's Theorem and series expansion	1	Blackboard + Lecture	12/01/2021	GK
8.	Evaluation of limits by L' Hospital's rule Type 1 Evaluation of limits of form $\frac{0}{0}$	3	Blackboard + Lecture	18/01/2021 24/01/2021 25/01/2021	GK
9.	Type 2 Evaluation of limits of form $\frac{\infty}{\infty}$	1	Blackboard + Lecture	01/02/2021	GK
10.	Type 3 Evaluation of limits of form $0 \times \infty , \infty - \infty$	2	Blackboard + Lecture	08/02/2021 09/02/2021	GK
11.	Type 4 Evaluation of limits of form $0^0, \infty^0, 1^\infty$	2	Blackboard + Lecture	15/02/2021 22/02/2021	GK
	Partial Differentiation				
1.	Higher order partial derivatives	1	Blackboard + Lecture	28/10/2021	PL
2.	Differentiation of homogeneous function	2	Blackboard + Lecture	30/10/2021 04/11/2021	PL
3.	Euler's theorem on homogeneous function	2	Blackboard + Lecture	08/11/2021 09/11/2021	PL
4.	Extension of Euler's theorem	1	Blackboard + Lecture	11/11/2021	PL
5.	Total differential	1	Blackboard + Lecture	15/11/2021	PL
6.	Total derivative	1	Blackboard + Lecture	16/11/2021	PL
7.	Chain rule for functions of two independent variables with one independent parameter	2	Blackboard + Lecture	20/11/2021 27/11/2021	PL
8.	Chain rule for functions of three independent variables with one independent parameter	2	Blackboard + Lecture + interaction	04/12/2021 11/12/2021	PL
9.	Chain rule for functions of two independent variables with two independent parameter	2	Blackboard + Lecture +interaction	18/12/2021 01/01/2021	PL
10.	Differentiation of implicit functions	2	Blackboard + Lecture +interaction	08/01/2021 10/01/2021	PL

11.	Jacobians and its properties	2	Blackboard + Lecture	10/01/2021 17/01/2021	PL
12.	Taylor's and Maclaurin's series for functions of two variables,	3	Blackboard + Lecture	18/01/2021 22/01/2021 24/01/2021	PL
13.	Maxima-Minima of functions of two variables	2	Blackboard + Lecture	29/01/2021 05/02/2021	PL
	FIRST INTERNAL TEST – 27/12/2021				
	SECOND INTERNAL TEST – 18/02/2021				
	ASSIGNMENTS – Solving question bank and model question papers				

KRP : PROF PUSHPA K R = 19 HOURS

PL : PROF PUSHPALATHA A = 23 HOURS

CS : PROF CHAITANYASHREE S = 16 HOURS

GK : PROF GANESH KUMAR = 18 HOURS

PRACTICALS

Total hours: 54

Sl No	Topic covered	No of lecture hours	Methodology
1.	Basics of software with simple examples.	4	Blackboard + Lecture + Hands on key
2.	Basics of software with simple examples.	4	Blackboard + Lecture + Hands on key
3.	Matrices –Algebra of Matrices with problems.	4	Blackboard + Lecture + Hands on key
4.	Computation of rank of a matrix by row reduced and normal forms.	4	Blackboard + Lecture + Hands on key
5.	Solving the system of homogeneous and non- homogeneous linear equations.	4	Blackboard + Lecture + Hands on key
6.	Computation of inverse of a matrix using Cayley-Hamilton theorem.	4	Blackboard + Lecture + Hands on key
7.	Finding the nth derivatives of functions without Leibnitz theorem.	4	Blackboard + Lecture + Hands on key
8.	Finding the nth derivatives of functions with Leibnitz's theorem.	4	Blackboard + Lecture + Hands on key
9.	Partial Differentiation of some standard functions and Jacobians.	4	Blackboard + Lecture + Hands on key
10.	Verification of Euler's theorem with examples.	4	Blackboard + Lecture + Hands on key
11.	Finding the Taylor's and Maclaurin's expansion of the given function.	4	Blackboard + Lecture + Hands on key
12.	Indeterminate forms and evaluation of limits using L-Hospital's rule.	4	Blackboard + Lecture + Hands on key
13.	REPETATION	4	Hands on key
	PRACTICAL INTERNAL TEST – 07/02/2022		

Vivekananda Degree College

Rajajinagar, Bangalore -55

Department of Mathematics

LESSON PLAN FOR THE ACADEMIC YEAR 2021-2022

Program: BSc
Course/Paper Name: Mathematic
Semester: Third Semester
Class: 3rd Year B.Sc.

Total Hours : 56

THEORY

Sl.No	Topic covered	No.of lecture hours	Methodology	Date	Initials
	Group Theory				
1.	Introduction and Recapitulation	2	Lecture + interaction	13/10/2021 18/10/2021	KRP
2.	Integral powers of an element of group	1	Blackboard + Lecture	25/10/2021	KRP
3.	Order of an element of a group	1	Blackboard + Lecture	30/10/2021	KRP
4.	Properties of Order of an element	2	Blackboard + Lecture	02/11/2021 09/11/2021	KRP
5.	Co-set decomposition of a group	2	Blackboard + Lecture	16/11/2021 27/11/2021	KRP
6.	Cyclic groups	2	Blackboard + Lecture	01/12/2021 07/12/2021	KRP
7.	Properties of Cyclic groups	2	Blackboard + Lecture	14/12/2021 21/12/2021	KRP
8.	Index of a subgroup of groups	1	Blackboard + Lecture	28/12/2021	KRP
9.	Lagrange's theorem	2	Blackboard + Lecture	18/01/2022 27/01/2022	KRP
10.	Consequences of Lagrange's theorem	2	Blackboard + Lecture	01/02/2022 08/02/2022	KRP

	Sequence and series of Real numbers				
1.	Introduction and Recapitulation	1	Lecture + interaction	16/10/2021	PL
2.	Bounded sequences	1	Blackboard + Lecture	22/10/2021	PL
3.	Least upper bound (supremum) and greatest lower bound (infimum) of a sequence	1	Blackboard + Lecture	23/10/2021	PL
4.	Limit of a sequences	1	Blackboard + Lecture	27/10/2021	PL
5.	convergent, divergent and oscillatory sequences	2	Blackboard + Lecture	29/10/2021 06/02/2021	PL
6.	Theorem of sequence	1	Blackboard + Lecture	10/11/2021	PL
7.	Algebra of sequence	1	Blackboard + Lecture	12/11/2021	PL
8.	Monotonic sequences and their properties	1	Blackboard + Lecture	13/11/2021	PL
9.	Some standard sequence	1	Blackboard + Lecture	17/11/2021	PL
10.	Cauchy's sequence	1	Blackboard + Lecture	19/11/2021	PL
11.	Application problems	2	Blackboard + Lecture	26/11/2021 08/12/2021	PL
12.	Infinite series _introduction	1	Blackboard + Lecture	20/11/2021	CS
13.	Behavior of an infinite series	1	Blackboard + Lecture	27/11/2021	CS
14.	Series of positive terms	1	Blackboard + Lecture	04/12/2021	CS
15.	Geometric series	2	Blackboard + Lecture	11/12/2021 18/12/2021	CS
16.	Test for convergence of series	1	Blackboard + Lecture	01/01/2022	CS
17.	comparison tests	2	Blackboard + Lecture	04/01/2022 06/01/2022	CS
18.	The p- series or harmonic series	1	Blackboard + Lecture	08/01/2022	CS
19.	D Alembert's test	1	Blackboard + Lecture	13/01/2022	CS

20.	Raabe's test	1	Blackboard + Lecture	21/01/2022	CS
21.	Cauchy's root Test	1	Blackboard + Lecture	21/01/2022	CS
22.	Alternating series - Leibnitz test	1	Blackboard + Lecture	29/01/2022	CS
23.	Absolute and conditional convergence	1	Blackboard + Lecture	05/02/2022	CS
24.	D' Alembert test for absolute convergence	1	Blackboard + Lecture	12/02/2022	CS
25.	Summation of binomial series	3	Blackboard + Lecture	10/12/2021 17/12/2021 31/12/2021	PL
26.	Summation of exponential series	3	Blackboard + Lecture	04/01/2022 08/01/2022 14/01/2022	PL
27.	Summation of logarithmic series	3	Blackboard + Lecture	21/01/2022 28/01/2022 04/02/2022	PL
28.	Application problems	2	Blackboard + Lecture	11/02/2022 16/02/2022	PL
	MATHEMATICAL METHODS -I				
1.	Introduction to Definition and basic properties	1	Lecture + interaction	24/11/2021	GK
2.	Laplace transform of derivatives	2	Blackboard + Interaction	30/11/2021 3/12/2021	GK
3.	Laplace transform of Integrals	1	Blackboard + Interaction	15/12/2021	GK
4.	Laplace transforms of periodic functions	1	Blackboard + Interaction	21/12/2021	GK
5.	Laplace Transform of the Heaviside function(or unit step function)	3	Blackboard + Interaction	22/12/2021 29/12/2021 05/01/2022	GK

6.	Convolution theorem	2	Blackboard + Interaction	12/01/2022 19/01/2022	GK
7.	The Inverse Laplace Transform	2	Blackboard + Interaction	25/01/2022 01/02/2022	GK
8.	Evaluation of $L^{-1}\left\{\frac{F(s)}{s}\right\}$; $L^{-1}\{F^n(s)\}$	1	Blackboard + Interaction	01/02/2022	GK
9.	Evaluation of Inverse Laplace transform by using the convolution theorem	2	Blackboard + Interaction	02/02/2022 03/02/2022	GK
10.	Application problems	2	Blackboard + Interaction	04/02/2022 09/02/2022	GK
	FIRST INTERNAL TEST – 29/12/2021				
	SECOND INTERNAL TEST – 19/02/2022				
	ASSIGNMENTS – Solving question bank and model question papers				

KRP : PROF PUSHPA K R = 17 HOURS

PL : PROF PUSHPALATHA A = 24 HOURS

CS : PROF CHAITANYASHREE S = 15 HOURS

GK : PROF GANESH KUMAR = 17 HOURS

PRACTICALS

Total hours: 42

Sl.No	Topic covered	No.of lecture hours	Methodology
1.	Examples for finding right and left coset and the index of a group	3	Blackboard + Lecture + Hands on key
2.	Examples to verify Lagrange's theorem.	3	Blackboard + Lecture + Hands on key
3.	Illustration of convergent, divergent and oscillatory sequence.	3	Blackboard + Lecture + Hands on key
4.	Illustration of convergent, divergent and oscillatory series.	3	Blackboard + Lecture + Hands on key
5.	Using Cauchy's criterion to determine the convergence of a sequence.	3	Blackboard + Lecture + Hands on key
6.	To find the sum of the series	3	Blackboard + Lecture + Hands on key
7.	Finding the Laplace transform	3	Blackboard + Lecture + Hands on key
8.	Finding the inverse Laplace transform.	3	Blackboard + Lecture + Hands on key
9.	Laplace transform method of solving first order ordinary differential equations with constant coefficients.	3	Blackboard + Lecture + Hands on key
10.	Laplace transform method of solving second order ordinary differential equations with constant coefficients.	3	Blackboard + Lecture + Hands on key
11.	REPETATION	3	Hands on key
	PRACTICAL INTERNAL TEST -15/02/2022		

Vivekananda Degree College

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Department of Mathematics

LESSON PLAN FOR THE ACADEMIC YEAR 2021-2022

Program: BSc

Course/Paper Name: Mathematic

Semester: Fifth Semester

Class: 5th Year B.Sc

Paper V

THEORY

Total Hours : 42

Sl.No	Topic covered	No.of lecture hours	Methodology	Date	Initials
	Algebra IV Rings, Integral Domains, Fields				
1.	Introduction and Recapitulation	1	Lecture + interaction	12/10/2021	PL
2.	Rings	1	Blackboard + Lecture	16/10/2021	PL
3.	Some special types Rings	1	Blackboard + Lecture	18/10/2021	PL
4.	Elementary Properties of Rings	1	Blackboard + Lecture	22/10/2021	PL
5.	Subrings	1	Blackboard + Lecture	25/10/2021	PL
6.	Results on Subrings of a ring	1	Blackboard + Lecture	26/10/2021	PL
7.	Ideals	1	Blackboard + Lecture	27/10/2021	PL
8.	Standard properties of Ideals	1	Blackboard + Lecture	30/10/2021	PL
9.	Homomorphism of rings	1	Blackboard + Lecture	06/11/2021	PL
10.	Properties of Homomorphism	1	Blackboard + Lecture	10/11/2021	PL
11.	Isomorphism	1	Blackboard + Lecture	13/11/2021	PL
12.	Properties of Isomorphism	1	Blackboard + Lecture	17/11/2021	PL
13.	Quotient rings	1	Blackboard + Lecture	23/11/2021	PL

Calculus V Differential Calculus Of Scalar And Vector Fields

1.	Introduction and Recapitulation	1	Lecture + interaction	06/12/2021	CS
2.	Scalar Field , Gradient of a Scalar field	1	Blackboard + Lecture	20/12/2021	CS
3.	Geometrical Meaning	1	Blackboard + Lecture	27/12/2021	CS
4.	Directional derivative , Maximum Directional derivative	1	Blackboard + Lecture	03/01/2022	CS
5.	Angle between 2 surface	1	Blackboard + Lecture	10/01/2022	CS
6.	Divergence and Curl of vector field	1	Blackboard + Lecture	11/01/2022	CS
7.	Solenoidal and irrotational fields	1	Blackboard + Lecture	17/01/2022	CS
8.	Scalar and Vector potentials	1	Blackboard + Lecture	22/01/2022	CS
9.	Laplacian of a scalar field , Harmonic function	1	Blackboard + Lecture	30/01/2022	CS
10.	Vector identities	1	Blackboard + Lecture	31/01/2022	CS
11.	Standard properties	1	Blackboard + Lecture	14/02/2022	CS
12.	Application Problems	1	Blackboard + Lecture	16/02/2022	CS

NUMERICAL METHODS – I

1.	Introduction and Recapitulation	1	Lecture + interaction	24/11/2021	PL
2.	Finite differences	1	Blackboard + Lecture	30/11/2021	PL
3.	Fundamental difference of finite difference	1	Blackboard + Lecture	01/12/2021	PL
.	Backward difference operator ∇	1	Blackboard + Lecture	07/12/2021	PL
	Relation Between the operators	1	Blackboard + Lecture	08/12/2021	PL
	Factorial notations	1	Blackboard + Lecture	14/12/2021	PL
	Separation of symbols	1	Blackboard + Lecture	15/12/2021	PL

8.	Interpolation	1	Blackboard + Lecture	21/12/2021	PL
9.	Interpolation with equal intervals	1	Blackboard + Lecture	22/12/2021	PL
10.	Interpolation with unequal intervals	1	Blackboard + Lecture	29/12/2021	PL
11.	The concept of divided difference	1	Blackboard + Lecture	04/01/2022	PL
12.	Newton's General divided difference Formula	1	Blackboard + Lecture	05/01/2022	PL
13.	Inverse interpolation	1	Blackboard + Lecture	12/01/2022	PL
14.	Numerical Integration	1	Blackboard + Lecture	18/01/2022	PL
15.	General Quadrature formula for equidistance ordinates :	1	Blackboard + Lecture	19/01/2022	PL
16.	i. Trapezoidal rule ii. Simpson's 1/3 rule iii. Simpson's 3/8 rule	3	Blackboard + Lecture	25/01/2022 01/02/2022 02/02/2022	PL
	FIRST INTERNAL TEST – 28/12/2021				
	SECOND INTERNAL TEST – 18/02/2022				
	ASSIGNMENTS – Solving question bank and model question papers				

PL : PROF PUSHPALATHA A = 31 HOURS

CS : PROF CHAITANYASHREE S = 12 HOURS

PRACTICALS

Total hours: 45

Sl.No	Topic covered	No.of lecture hours	Methodology
1.	Examples on different types of rings.	3	Blackboard + Lecture + Hands on key
2.	Examples on integral domains and fields.	3	Blackboard + Lecture + Hands on key
3.	Examples on subrings, ideals and subrings which are not ideals.	3	Blackboard + Lecture + Hands on key
4.	Homomorphism and isomorphism of rings-illustrative examples.	3	Blackboard + Lecture + Hands on key
5.	Example on Euler's equation in full form.	3	Blackboard + Lecture + Hands on key
6.	Example on particular forms of Euler's equation.	3	Blackboard + Lecture + Hands on key
7.	Examples on minimum surface of revolution and Brachistochrone problem.	3	Blackboard + Lecture + Hands on key
8.	Examples on Isoperimetric problems.	3	Blackboard + Lecture + Hands on key
9.	Using cyclic notations to derive some more vector identities.	3	Blackboard + Lecture + Hands on key
10.	Programs on Interpolations with equal intervals.	3	Blackboard + Lecture + Hands on key
11.	Programs on Interpolations with unequal intervals.	3	Blackboard + Lecture + Hands on key
12.	programs to evaluate integrals using Simpson's $\frac{1}{3}^{rd}$ rule and $\frac{3}{8}^{th}$ rule.	3	Blackboard + Lecture + Hands on key
13.	Programs to evaluate integrals using Weddle's rule.	3	Blackboard + Lecture + Hands on key
14.	REPETATION	3	Hands on key
	PRACTICAL INTERNAL TEST – 27/11/2021		

Paper VI

THEORY

Total Hours : 42

Sl No	Topic covered	No of lecture hours	Methodology	Date	Initials
	MATHEMATICAL METHODS – II Calculus Of Variation				
1.	Introduction and Recapitulation	2	Lecture + interaction	19/11/2021 26/11/2021	GK
2.	Functional	1	Blackboard + Lecture	29/11/2021	GK
3.	Variation of a function f = f(x, y, y')	2	Blackboard + Lecture	03/12/2021 10/12/2021	GK
4.	Properties	2	Blackboard + Lecture	17/12/2021 01/01/2022	GK
5.	Euler's equation	2	Blackboard + Lecture	07/01/2022 13/01/2022	GK
6.	Particular forms of Euler's equation	3	Blackboard + Lecture	14/01/2022 18/01/2022 21/01/2022	GK
7.	Application of Calculus of variation	2	Blackboard + Lecture	04/02/2022 07/02/2022	GK
8.	Isoperimetric problems	2	Blackboard + Lecture	08/02/2022 11/02/2022	GK
	CALCULUS – VI a). Line And Multiple Integrals				
1.	Introduction and Recapitulation	1	Lecture + interaction	13/10/2021	KRP
2.	Line integral over plane curves	1	Blackboard + Lecture	23/10/2021	KRP
3.	Basic properties of line integrals	1	Blackboard + Lecture	29/10/2021	KRP
4.	Line integral over space curves	1	Blackboard + Lecture	02/11/2021	KRP
5.	Independent of paths	1	Blackboard +	09/11/2021	KRP

			Lecture		
6.	Definition of double integral	1	Blackboard + Lecture	12/11/2021	KRP
7.	Evaluation of double integral	1	Blackboard + Lecture	15/11/2021	KRP
8.	Change of order of integration	1	Blackboard + Lecture	16/11/2021	KRP
9.	Change of variables	1	Blackboard + Lecture	17/11/2021	KRP
10.	Double integral in polar form	1	Blackboard + Lecture	20/11/2021	KRP
11.	Application of double integral to find Area and Volume	1	Blackboard + Lecture	24/11/2021	KRP
12.	Computation of plane areas	1	Blackboard + Lecture	27/11/2021	KRP
13.	Area in Cartesian form	1	Blackboard + Lecture	01/12/2021	KRP
14.	Area in Polar form	1	Blackboard + Lecture	04/12/2021	KRP
15.	Computation of surface areas	1	Blackboard + Lecture	08/12/2021	KRP
16.	Volume underneath a surface	1	Blackboard + Lecture	11/12/2021	KRP
17.	Volume of revolution using double integrals	1	Blackboard + Lecture	13/12/2021	KRP
18.	Triple integral	1	Blackboard + Lecture	15/12/2021	KRP
19.	Change of variables in Triple integral	1	Blackboard + Lecture	22/12/2021	KRP
20.	Triple integral in cylindrical Polar form	1	Blackboard + Lecture	29/12/2021	KRP
21.	Triple integral in spherical Polar form	1	Blackboard + Lecture	31/12/2021	KRP
22.	Computation of volume by triple integral	1	Blackboard + Lecture	07/01/2022	KRP
	b) Integral Theorems				
1.	Introduction and Recapitulation	1	Lecture + interaction	08/01/2022	KRP
2.	Green's theorem	1	Blackboard + Lecture	17/01/2022	KRP
3.	Proof of Green's theorem	1	Blackboard + Lecture	19/01/2022	KRP

4.	Extension of Green's theorem	1	Blackboard + Lecture	21/01/2022	KRP
5.	The Gauss Divergence theorem	1	Blackboard + Lecture	24/01/2022	KRP
6.	Stokes' theorem	2	Blackboard + Lecture	02/02/2022 05/02/2022	KRP
	FIRST INTERNAL TEST – 05/01/2022				
	SECOND INTERNAL TEST – 19/02/2022				
	ASSIGNMENTS – Solving question bank and model question papers				

KRP : PROF PUSHPA K R = 29 HOURS

GK : PROF GANESH KUMAR = 16 HOURS

PRACTICALS

Total hours: 45

Sl.No	Topic covered	No of lecture hours	Methodology
1	Example on Euler's equation in full form	4	Blackboard + Lecture + Hands on key
2	Example on particular forms of Euler's equation	4	Blackboard + Lecture + Hands on key
3	Examples on minimum surface of revolution and Brachistochrome problem	4	Blackboard + Lecture + Hands on key
4	Examples on Isoperimetric problems.	3	Blackboard + Lecture + Hands on key
5	Evaluation of the line integral with constant limits.	4	Blackboard + Lecture + Hands on key
6	Evaluation of the double integral with constant limits.	3	Blackboard + Lecture + Hands on key
7	Evaluation of the triple integral with constant limits.	4	Blackboard + Lecture + Hands on key
8	Evaluation of the line integral with variable limits.	3	Blackboard + Lecture + Hands on key
9	Evaluation of the double integral with variable limits.	3	Blackboard + Lecture + Hands on key
10.	Evaluation of the triple integral with variable limits.	3	Blackboard + Lecture + Hands on key
11.	Verifying Green's theorem.	3	Blackboard + Lecture + Hands on key
12.	Verifying Gauss divergence theorem.	3	Blackboard + Lecture + Hands on key
13.	Verifying Stokes' theorem	3	Blackboard + Lecture + Hands on key
14.	REPETAION	3	Blackboard + Lecture + Hands on key
	PRACTICAL INTERNAL TEST – 05/02/2022		Hands on key

Vivekananda Degree College

Rajajinagar, Bangalore -55

Department of Mathematics

LESSON PLAN FOR THE ACADEMIC YEAR 2021-2022(NEP)

Program: BSc

Course/Paper Name: Mathematics

Semester: First Semester (Open)

Class: 1st Year B.Sc.

Total Hours : 56

THEORY

Sl.No	Topic covered	No.of lecture hours	Methodology	Date	Initials
	Algebra I -Matrix				
1.	Introduction and Recapitulation	1	Lecture + interaction	04/12/2021	CS
2.	Elementary row and column transformations	1	Blackboard + Lecture + Interaction	27/12/2021	CS
3.	Equivalent Matrices	1	Blackboard + Interaction	28/12/2021	CS
4.	Elementary Matrix	1	Blackboard + Interaction	01/01/2022	CS
5.	Row reduced echelon form of a matrix	1	Blackboard + Interaction	04/01/2022	CS
6.	Rank of a matrix , Some important results	1	Blackboard + Interaction	08/01/2022	CS
7.	Rank of a matrix by row reduction	1	Blackboard + Interaction	11/01/2022	CS
8.	Normal form	1	Blackboard + Interaction	18/01/2022	CS
9.	Linear equations	1	Blackboard + Lecture	22/01/2022	CS
10.	Homogeneous system of linear equations	1	Blackboard + Lecture	25/01/2022	CS
11.	Non-homogeneous system of linear equations	2	Blackboard + Lecture	29/01/2022 01/02/2022	CS
12.	Condition for consistency	1	Blackboard + Lecture	05/02/2022	CS
13.	Solution by Gauss elimination method	1	Blackboard + Lecture	15/02/2022	CS

14.	Eigen values and Eigen vectors , Relationship between Eigen values and Eigen vectors	1	Blackboard + Lecture	16/02/2022	CS
15.	Caley-Hamilton theorem	2	Blackboard + Lecture	22/02/2022 26/02/2022	CS
	Differential calculus				
1.	Introduction and Recapitulation	1	Lecture + interaction	02/12/2021	GK
2.	Limits , Continuity	1	Blackboard + Lecture	11/12/2021	GK
3.	Differentiability and properties	1	Blackboard + Lecture	29/12/2021	GK
4.	Properties of Continuous function	1	Blackboard + Lecture	05/01/2022	GK
5.	nth derivatives of standard function	1	Blackboard + Lecture	08/01/2022	GK
6.	Problems on nth derivative	1	Blackboard + Lecture	12/01/2022	GK
7.	Leibniz's theorem	1	Blackboard + Lecture	19/01/2022	GK
8.	Application Problems	1	Blackboard + Lecture	20/01/2022	GK
9.	Intermediate Value Theorem , Rolle's Theorem	1	Blackboard + Lecture	27/01/2022	GK
10.	Lagrange's Mean Value Theorem (First Mean Value Theorem)	1	Blackboard + Lecture	29/01/2022	GK
11.	Cauchy's Mean Value Theorem	1	Blackboard + Lecture	03/02/2022	GK
12.	Taylors theorem , Problems on Taylors series expansion	1	Blackboard + Lecture	05/02/2022	GK
13.	Problems on McLaurin's Theorem and series expansion	1	Blackboard + Lecture	10/02/2022	GK
14.	Evaluation of limits by L' Hospital's rule Type 1 Evaluation of limits of form $\frac{0}{0}$	1	Blackboard + Lecture	23/02/2022	GK
15.	Type 2 Evaluation of limits of form $\frac{\infty}{\infty}$	1	Blackboard + Lecture	24/02/2022	GK
16.	Type 3 Evaluation of limits of form $0 \times \infty , \infty - \infty$	1	Blackboard + Lecture	24/02/2022	GK
17.	Type 4 Evaluation of limits of form $0^0, \infty^0, 1^\infty$	1	Blackboard + Lecture	26/02/2022	GK

14.	Eigen values and Eigen vectors , Relationship between Eigen values and Eigen vectors	1	Blackboard + Lecture	16/02/2022	CS
15.	Caley-Hamilton theorem	2	Blackboard + Lecture	22/02/2022 26/02/2022	CS
	Differential calculus				
1.	Introduction and Recapitulation	1	Lecture + interaction	02/12/2021	GK
2.	Limits , Continuity	1	Blackboard + Lecture	11/12/2021	GK
3.	Differentiability and properties	1	Blackboard + Lecture	29/12/2021	GK
4.	Properties of Continuous function	1	Blackboard + Lecture	05/01/2022	GK
5.	nth derivatives of standard function	1	Blackboard + Lecture	08/01/2022	GK
6.	Problems on nth derivative	1	Blackboard + Lecture	12/01/2022	GK
7.	Leibniz's theorem	1	Blackboard + Lecture	19/01/2022	GK
8.	Application Problems	1	Blackboard + Lecture	20/01/2022	GK
9.	Intermediate Value Theorem , Rolle's Theorem	1	Blackboard + Lecture	27/01/2022	GK
10.	Lagrange's Mean Value Theorem (First Mean Value Theorem)	1	Blackboard + Lecture	29/01/2022	GK
11.	Cauchy's Mean Value Theorem	1	Blackboard + Lecture	03/02/2022	GK
12.	Taylors theorem , Problems on Taylors series expansion	1	Blackboard + Lecture	05/02/2022	GK
13.	Problems on McLaurin's Theorem and series expansion	1	Blackboard + Lecture	10/02/2022	GK
14.	Evaluation of limits by L' Hospital's rule Type 1 Evaluation of limits of form $\frac{0}{0}$	1	Blackboard + Lecture	23/02/2022	GK
15.	Type 2 Evaluation of limits of form $\frac{\infty}{\infty}$	1	Blackboard + Lecture	24/02/2022	GK
16.	Type 3 Evaluation of limits of form $0 \times \infty , \infty - \infty$	1	Blackboard + Lecture	24/02/2022	GK
17.	Type 4 Evaluation of limits of form $0^0, \infty^0, 1^\infty$	1	Blackboard + Lecture	26/02/2022	GK

	Integral Calculus				
1.	Recapitulation of Definite integrals	2	Blackboard + Lecture	13/12/2021 20/12/2021	PL
2.	Properties.	2	Blackboard + Lecture	30/12/2021 30/12/2021	PL
3.	Computation of length of arc	2	Blackboard + Lecture	03/01/2022 10/01/2022	PL
4.	Area of plane curves	3	Blackboard + Lecture	13/01/2022 17/01/2022 20/01/2022	PL
5.	Area and volume of revolution in Cartesian form.	3	Blackboard + Lecture	27/01/2022 31/01/2022 10/02/2022	PL
	FIRST INTERNAL TEST - 19/02/2022				
	ASSIGNMENTS – Solving question bank and model question papers				

PL : PROF PUSHPALATHA A = 12 HOURS

CS : PROF CHAITANYASHREE S = 17 HOURS

GK : PROF GANESH KUMAR = 17 HOURS

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VIVEKANANDA DEGREE COLLEGE
BENGALURU-55

Vivekananda Degree College

Rajajinagar, Bangalore -55

Department of Mathematics

LESSON PLAN FOR THE ACADEMIC YEAR 2021-2022(NEP)

Program: BSc
Course/Paper Name: Mathematics
Semester: Second Semester
Class: 1st Year B Sc

Total Hours : 70

THEORY

Sl. No	Topic covered	No. of Lecture Hours	Methodology	Date	Initials
	Algebra II - Group Theory				
1.	Definition of a group with examples and properties	1	Lecture + interaction	07/06/2022	GK
2.	Congruence and its problems	2	Blackboard + Interaction	14/06/2022 21/06/2022	GK
3.	Subgroups, center of groups and order of an element of a group	2	Blackboard + Interaction	05/07/2022 12/07/2022	GK
4.	Its related theorems	1	Blackboard + Interaction	14/07/2022	GK
5.	Cyclic groups	2	Blackboard + Interaction	19/07/2022 23/07/2022	GK
6.	Coset decomposition	2	Blackboard + Interaction	29/07/2022 02/08/2022	GK
7.	Factor groups	1	Blackboard + Interaction	16/08/2022	GK
8.	Lagrange's theorem and its consequences	2	Blackboard + Interaction	19/08/2022 23/08/2022	GK
9.	Fermat's theorem and Euler's ϕ function	2	Blackboard + Interaction	06/09/2022 07/09/2022	GK
	Groups – II - Normal Sub Groups				
1.	Introduction to Normal subgroups	1	Lecture + interaction	09/06/2022	KRP
2.	Theorems on Normal subgroups	2	Blackboard + Interaction	28/06/2022 30/06/2022	KRP
3.	Some results on Normal subgroups	1	Blackboard + Interaction	14/07/2022	KRP

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4	Centre of a group . Definitions and theorems	1	Blackboard + Interaction	21/07/2022	KRp
5	Quotient Group (Factor group) and theorems	1	Blackboard + Interaction	25/07/2022	KRp
6	Homomorphism of groups	1	Blackboard + Interaction	11/08/02022	KRP
7	Properties of Homomorphism of groups	1	Blackboard + Interaction	14/08/2022	KRP
8.	Kernel of a homomorphism and theorems	1	Blackboard + Interaction	18/08/2022	KRP
9	Isomorphism of groups , Fundamental theorem of homomorphism	1	Blackboard + Interaction	24/08/2022	KRP
10.	Properties related to Isomorphism	2	Blackboard + Interaction	25/08/2022 05/09/2022	KRP
11.	Permutation group	2	Blackboard + Interaction	08/09/2022 13/09/2022	KRP
12.	Cayley's theorem	2	Blackboard + Interaction	14/09/2022 15/09/2022	KRP
	Calculus II – (2a)Differential Calculus1				
1.	Introduction - Polar Coordinates , Relation between the Cartesian and the Polar coordinates	1	Lecture + interaction	08/06/2022	CS
2.	Angle of intersection of curves	1	Blackboard + Interaction	15/06/2022	CS
3.	Polar sub tangent and polar sub normal	1	Blackboard + Interaction	29/06/2022	CS
4.	Perpendicular from the pole on the tangent	1	Blackboard + Interaction	02/07/2022	CS
5.	Pedal equation or p-r equation of a curve	1	Blackboard + Interaction	09/07/2022	CS
6.	To determine the pedal equation of a curve	1	Blackboard + Interaction	13/07/2022	CS
7.	Derivation of an arc length	1	Blackboard + Interaction	20/07/2022	CS
8.	Curvature of plane curves	1	Blackboard + Interaction	28/07/2022	CS
9.	Radius of curvature for different forms of curves	1	Blackboard + Interaction	01/08/2022	CS
10.	Radius of curvature in parametric form	1	Blackboard + Interaction	03/08/2022	CS
11.	Radius of curvature in polar form	1	Blackboard + Interaction	04/08/2022	CS

12.	Centre of curvature	1	Blackboard + Interaction	08/08/2022	CS
13.	Coordinates of the centre of curvature in Cartesian form	1	Blackboard + Interaction	14/08/2022	CS
14.	Centre of curvature in parametric form	1	Blackboard + Interaction	17/08/2022	CS
15.	Evolutes	1	Blackboard + Interaction	19/08/2022	CS
16.	Double points, Multiple points	1	Blackboard + Interaction	25/08/2022	CS
17.	Classification of double points	1	Blackboard + Interaction	04/09/2022	CS
18.	Tangents at the origin	1	Blackboard + Interaction	05/09/2022	CS
19.	Working rule for finding the position and nature of the double point of the curve $f(x,y)=0$	1	Blackboard + Interaction	07/09/2022	CS
20.	Asymptotes, Determination of asymptotes parallel to the coordinate axes	1	Blackboard + Interaction	08/09/2022	CS
21.	Oblique Asymptotes	1	Blackboard + Interaction	12/09/2022	CS
22.	Asymptotes for polar curves	1	Blackboard + Interaction	13/09/2022	CS
23.	Envelopes	1	Blackboard + Interaction	14/09/2022	CS
24.	Method of finding the envelope of the family of curves $f(x,y,\propto)=0$	1	Blackboard + Interaction	14/09/2022	CS
	Calculus II - (2b) Integral Calculus				
1.	Recapitulation of definite integrals and its properties	1	Lecture + interaction	11/06/2022	PL
2.	Reduction formulae for $\int \sin^n x \, dx$	1	Blackboard + Lecture	18/06/2022	PL
3.	Reduction formulae for $\int \cos^n x \, dx$	1	Blackboard + Lecture	02/07/2022	PL
4.	Reduction formulae for $\int \sin^n x \cos^n x \, dx$	1	Blackboard + Lecture	09/07/2022	PL
5.	Reduction formulae for $\int_0^{\frac{\pi}{2}} \cot^n x \, dx$	1	Blackboard + Lecture	16/07/2022	PL

6	Reduction formulae for $\int_0^{\frac{\pi}{2}} \sec^n x \ dx$	1	Blackboard + Lecture	26/07/2022	PL
7	Reduction formulae for $\int_0^{\frac{\pi}{2}} cosec^n x \ dx$	1	Blackboard + Lecture	30/07/2022	PL
8.	Problems	1	Blackboard + Lecture	06/08/2022	PL
9.	Computation of length of an arc	1	Blackboard + Lecture	13/08/2022	PL
10.	Area of plane curves	2	Blackboard + Interaction	17/08/2022 19/08/2022	PL
11.	Surface area of revolution	2	Blackboard + Interaction	20/08/2022 03/09/2022	PL
12.	Volume of revolution	2	Blackboard + Interaction	04/09/2022 08/09/2022	PL
	FIRST INTERNAL TEST – 15/07/2022				
	SECOND INTERNAL TEST - 01/09/2022				
	ASSIGNMENTS – Solving question bank and model question papers				

KRP : PROF PUSHPA K R = 16 HOURS

PL : PROF PUSHPALATHA A = 15 HOURS

CS : PROF CHAITANYASHREE S = 24 HOURS

GK : PROF GANESH KUMAR = 15 HOURS

PRACTICALS

Total Hours : 52

Sl. No	Topic covered	No. of Lecture Hours	Methodology
1.	Program to construct Cayley's table and test commutatively for a given finite set.	4	Blackboard + Lecture + Hands on key
2.	Program to find all possible cosets of the given finite group.	4	Blackboard + Lecture + Hands on key
3.	Program to find generators and corresponding possible subgroups of a cyclic group	4	Blackboard + Lecture + Hands on key
4.	Program to verify Lagrange's theorem with suitable examples.	4	Blackboard + Lecture + Hands on key
5.	Program to verify Euler's ϕ Function for a given finite group.	4	Blackboard + Lecture + Hands on key
6.	Program to verify the given function is homomorphism and isomorphism.	4	Blackboard + Lecture + Hands on key
7.	Program to solve problems using reduction formulae.	4	Blackboard + Lecture + Hands on key
8.	Program to compute surface area.	4	Blackboard + Lecture + Hands on key
9.	Program to compute volume of revolution.	4	Blackboard + Lecture + Hands on key
10.	Finding the angle between the radius vector and tangent.	4	Blackboard + Lecture + Hands on key
11.	Finding the angle between two curves.	4	Blackboard + Lecture + Hands on key
12.	Finding the radius of curvature of the given curve.	4	Blackboard + Lecture + Hands on key
13.	REPETITION	4	Hands on key
	PRACTICAL INTERNAL TEST - 08/08/2022		

Vivekananda Degree College

Rajajinagar, Bangalore -55

Department of Mathematics

LESSON PLAN FOR THE ACADEMIC YEAR 2021-2022

Program: BSc

Course/Paper Name: Mathematics

Semester: Fourth Semester

Class: 2nd Year B.Sc.

Total Hours: 71

THEORY

Sl. No.	Topic covered	No. of Lecture Hours	Methodology	Date	Initials
	Algebra IV – Group theory (Normal Sub Groups)				
1.	Introduction to groups	1	Lecture + interaction	17/05/2022	KRP
2.	Theorems on Normal subgroups	2	Blackboard + Interaction	23/05/2022	KRP
3.	Some results on Normal subgroups	1	Blackboard + Interaction	31/05/2022	KRP
4.	Centre of a group , Definitions and theorems	1	Blackboard + Interaction	07/06/2022	KRP
5.	Quotient Group (Factor group) and theorems	1	Blackboard + Interaction	14/06/2022	KRP
6.	Homomorphism of groups	1	Blackboard + Interaction	20/06/2022	KRP
7.	Properties of Homomorphism of groups	1	Blackboard + Interaction	28/06/2022	KRP
8.	Kernel of a homomorphism and theorems	1	Blackboard + Interaction	05/07/2022	KRP
9.	Isomorphism of groups , Fundamental theorem of homomorphism	1	Blackboard + Interaction	10/07/2022	KRP
10.	Properties related to Isomorphism	2	Blackboard + Interaction	19/07/2022 22/07/2022	KRP
11.	Permutation group	2	Blackboard + Interaction	25/07/2022 13/08/2022	KRP
12.	Cayley's theorem	2	Blackboard + Interaction	16/08/2022 21/08/2022	KRP

	Analysis II – Fourier Series				
1	Introduction to Periodic functions, Trigonometric Fourier series	2	Lecture + interaction	19/05/2022 21/05/2022	CS
2	Derivation of Euler's formulae	2	Blackboard + Interaction	28/05/2022 11/06/2022	CS
3	Even and odd functions and illustrative examples	2	Blackboard + Interaction	18/06/2022 25/06/2022	CS
4	Even and odd nature of $f(x)$ defined in $(0,2\pi)$	3	Blackboard + Interaction	02/07/2022 12/07/2022 16/07/2022	CS
5	Fourier series of arbitrary period	4	Blackboard + Interaction	21/07/2022 23/07/2022 30/07/2022 06/08/2022	CS
6.	Half Range Fourier Expansion , Cosine series and Sine series	4	Blackboard + Interaction	13/08/2022 14/08/2022 16/08/2022 18/08/2022	CS
7.	Application problems	2	Blackboard + Interaction	20/08/2022 23/08/2022	CS
	Calculus III – Differential Calculus				
1.	Introduction and Recapitulation , Limit of a function in ε-δ form	1	Lecture + interaction	18/05/2022	GK
2.	Limit of real valued function, Left and right hand limit	1	Blackboard + Interaction	23/05/2022	GK
3.	Limits at infinity, Uniqueness of limit of a function	1	Blackboard + Interaction	25/05/2022	GK
4.	Bounds of a function, Least upper bound (supremum) and greatest lower bound (infimum)	1	Blackboard + Interaction	01/06/2022	GK
5.	Continuity , left hand and right hand limits, Discontinuity of a function	1	Blackboard + Interaction	08/06/2022	GK
6.	Algebra of Continuity, Theorem of Continuity	1	Blackboard + Interaction	15/06/2022	GK
7.	Differentiability , left hand and right hand derivative	1	Blackboard + Interaction	23/06/2022	GK
8.	Mean Value Theorem, Rolle's Theorem, Geometrical interpretation of Rolle's Theorem	1	Blackboard + Interaction	24/06/2022	GK
9.	Lagrange's Mean Value Theorem (First Mean Value Theorem)	1	Blackboard + Interaction	29/06/2022	GK
10.	Cauchy's Mean Value Theorem	1	Blackboard + Interaction	09/08/2022	GK

11.	Taylors theorem. Problems on Taylors series expansion	1	Blackboard + Interaction	13/07/2022	GK
12.	Problems on McLaurin s Theorem and series expansion	1	Blackboard + Interaction	19/07/2022	GK
13.	Evaluation of limits by L' Hospital's rule, Type 1 Evaluation of limits of form $\frac{0}{0}$	1	Blackboard + Interaction	20/07/2022	GK
14.	Type 2 Evaluation of limits of form $\frac{\infty}{\infty}$, Type 3 Evaluation of limits of form $0 \times \infty$, $\infty - \infty$	1	Blackboard + Interaction	26/07/2022	GK
15.	Type 4 Evaluation of limits of form $0^0, \infty^0, 1^\infty$, Continuity and differentiability of a function of two and three variables	1	Blackboard + Interaction	02/08/2022	GK
16.	Taylor's Theorem for a function of two variables	1	Blackboard + Interaction	03/08/2022	GK
17.	Maclaurin's Expansion for $f(x, y)$ and problems	1	Blackboard + Interaction	10/08/2022	GK
18.	Maxima and Minima of functions of two variables	2	Blackboard + Interaction	17/08/2022	GK
19.	Lagrange's Method of undetermined multipliers	2	Blackboard + Interaction	20/08/2022	GK
	Differential Equations - II				
1.	Introduction to Second and higher order linear differential equations with constant coefficients – complimentary function – particular integrals	1	Lecture + interaction	20/05/2022	PL
2.	Homogeneous equations of second order with constant coefficients	2	Blackboard + Interaction	27/05/2022 03/06/2022	PL
3.	Method of finding the complimentary function	1	Blackboard + Interaction	10/06/2022	PL
4.	Linear non- homogeneous equations of second order with constant coefficients	1	Blackboard + Interaction	21/06/2022	PL
5.	Specific forms of Particular integrals	3	Blackboard + Interaction	22/06/2022 01/07/2022 06/07/2022	PL
6.	Cauchy – Euler homogeneous linear equation	2	Blackboard + Interaction	08/07/2022 15/07/2022	PL
7.	Simultaneous linear differential equations with constant coefficients	2	Blackboard + Interaction	22/07/2022 28/07/2022	PL
8.	Solution when a part of the complimentary function is known	1	Blackboard + Interaction	29/07/2022	PL

9.	Solution by Changing the independent variable	1	Blackboard + Interaction	02/08/2022	PL
10.	Solution by Changing the dependent variable	1	Blackboard + Interaction	04/08/2022	PL
11.	Method of Variation of parameters	1	Blackboard + Interaction	11/08/2022	PL
12.	Solution when the equation is exact	1	Blackboard + Interaction	14/08/2022	PL
	FIRST INTERNAL TEST - 04/06/2022				
	SECOND INTERNAL TEST - 26/07/2022				
	ASSIGNMENTS – Solving question bank and model question papers				

KRP : PROF PUSHPA K R = 16 HOURS

PL : PROF PUSHPALATHA A = 17 HOURS

CS : PROF CHAITANYASHREE S = 19 HOURS

GK : PROF GANESH KUMAR = 19 HOURS

PRACTICALS

Total Hours: 42

Sl. No	Topic covered	No. of Lecture Hours	Methodology
1.	Verification of Normality of a given subgroup	3	Blackboard + Lecture + Hands on key
2.	Illustrating homomorphism and isomorphism of groups	3	Blackboard + Lecture + Hands on key
3.	To find full range trigonometric Fourier series of some simple functions with period 2π and $2L$.	3	Blackboard + Lecture + Hands on key
4.	Finding the half-range sine and cosine series of simple functions and plotting them	3	Blackboard + Lecture + Hands on key
5.	Program to illustrate continuity of a function	3	Blackboard + Lecture + Hands on key
6.	Program to illustrate differentiability of a function	3	Blackboard + Lecture + Hands on key
7.	Program to verify Rolle's theorem	3	Blackboard + Lecture + Hands on key
8.	Program to verify Lagrange's theorem	3	Blackboard + Lecture + Hands on key
9.	Evaluation of limits by L'Hospital's rule	3	Blackboard + Lecture + Hands on key
10.	Solution of second and higher order ordinary differential equations with constant coefficients	3	Blackboard + Lecture + Hands on key
11.	Solution of second order ordinary differential equations with variable coefficients i) Method of variation of parameters ii) When the equation is exact	3	Blackboard + Lecture + Hands on key
12.	REPETITION	3	Hands on key
	PRACTICAL INTERNAL TEST - 04/08/2022		

Vivekananda Degree College

Rajajinagar, Bangalore -55

Department of Mathematics

LESSON PLAN FOR THE ACADEMIC YEAR 2021-2022

Program: BSc

Course/Paper Name: Mathematics

Semester: Sixth Semester

Class: 3rd Year B.Sc.

Paper VII

Total Hours : 57

THEORY

Sl. No.	Topic covered	No. of Lecture Hours	Methodology	Date	Initials
	Algebra V – Linear Algebra				
1.	Introduction to vector spaces , Examples on vector spaces	2	Lecture + interaction	25/05/2022	GK
2.	Properties of vector spaces	1	Blackboard + Interaction	27/05/2022	GK
3.	Vector subspaces	2	Blackboard + Interaction	03/06/2022	GK
4.	Linear combination of vectors : Linear span of a set	1	Blackboard + Interaction	10/06/2022	GK
5.	Linear span : Definition	1	Blackboard + Interaction	10/06/2022	GK
6.	Linear dependence and linear independence of vectors	2	Blackboard + Interaction	24/06/2022	GK
7.	Basis and Dimension	2	Blackboard + Interaction	01/07/2022	GK
8.	Finite dimensional	1	Blackboard + Interaction	01/07/2022	GK
9.	Linear transformations	1	Blackboard + Interaction	08/07/2022	GK
10.	Properties of linear transformation	1	Blackboard + Interaction	15/07/2022	GK
11.	Matrix of a linear transformation	2	Blackboard + Interaction	22/07/2022	GK
12.	Change of a basis	1	Blackboard + Interaction	30/07/2022	GK
13.	Range and Kernel of a linear transformation	1	Blackboard + Interaction	06/08/2022	GK

14	[illegible]	1	Blackboard + Interaction	[illegible]	KRP
15	[illegible]	1	Blackboard + Interaction	[illegible]	KRP
16	[illegible]	1	Blackboard + Interaction	[illegible]	KRP

2(a) Differential Equations III – Orthogonal curvilinear coordinates

1	Introduction to Relation between base vectors and normal vectors	2	Lecture + Interaction	[illegible]	KRP
2	Elementary arc length – Spherical coordinate system – Cartesian, cylindrical	2	Blackboard + Interaction	[illegible]	KRP
3	Cylindrical polar coordinates	2	Blackboard + Interaction	[illegible]	KRP
4	Spherical polar coordinates	2	Blackboard + Interaction	[illegible]	KRP

2(b) Total , Simultaneous and Partial Differential Equations

1	Introduction to Total differential equations	1	Lecture + Interaction	01/06/2022	KRP
2.	A necessary and sufficient condition for the total differential equation	1	Blackboard + Interaction	04/06/2022	KRP
3	Geometric interpretation of $Pdx + Qdy + Rdz = 0$	1	Blackboard + Interaction	10/06/2022	KRP
4	Methods of solving $Pdx + Qdy + Rdz = 0$	1	Blackboard + Interaction	11/06/2022	KRP
5	Simultaneous equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	2	Blackboard + Interaction	15/06/2022	KRP
6	Partial Differential equations – Introduction to kinds of Partial differential equations	1	Blackboard + Interaction	18/06/2022	KRP
7	Formation of Partial differential equations Method of elimination of arbitrary constants	2	Blackboard + Interaction	22/06/2022	KRP
8.	Method of elimination of arbitrary functions	1	Blackboard + Interaction	29/06/2022	KRP
9.	Linear Partial differential equation of first order	2	Blackboard + Interaction	02/07/2022	KRP
10.	Standard types of first order non – linear partial differential equations Type I – Equations of the type $f(p, q) = 0$	1	Blackboard + Interaction	04/07/2022	KRP

11.	Type II : Clariaut's equation	1	Blackboard + Interaction	09/07/2022	KRP
12.	Type III : Equation of the type $f(p,q,z) = 0$	1	Blackboard + Interaction	11/07/2022	KRP
13.	Type IV : Equation of the type $f_1(x,p) = f_2(y,q)$	1	Blackboard + Interaction	13/07/2022	KRP
14.	General method of solving Partial differential equations of non – linear type with two independent variables	2	Blackboard + Interaction	18/07/2022	KRP
15.	Second order linear partial differential equations in two variables with constant coefficients	3	Blackboard + Interaction	20/07/2022 23/07/2022	KRP
16.	Rules for finding the Particular Integral	1	Blackboard + Interaction	13/08/2022	KRP
17.	Non-Homogeneous linear equations with constant coefficients	2	Blackboard + Interaction	14/08/2022	KRP
18.	Solutions of one – dimensional heat equation using Fourier series	2	Blackboard + Interaction	14/08/2022	KRP
19.	Solutions of one – dimensional wave equation using Fourier series	2	Blackboard + Interaction	18/08/2022	KRP
	FIRST INTERNAL TEST - 25/07/2022				
	SECOND INTERNAL TEST - 26/08/2022				
	ASSIGNMENTS – Solving question bank and model question papers				

KRP : PROF PUSHPA K R = 36 HOURS

GK : PROF GANESH KUMAR = 21 HOURS

PRACTICALS

Total Hours: 42

Sl. No	Topic covered	No. of Lecture Hours	Methodology
1.	i) Vector space, subspace – illustrative examples. ii) Expressing a vector as a linear combination of given set of vectors. iii) Examples on linear dependence and independence of vectors.	3	Blackboard + Lecture + Hands on key
2.	i) Basis and Dimension – illustrative examples. ii) Verifying whether a given transformation is linear.	3	Blackboard + Lecture + Hands on key
3.	i) Finding matrix of a linear transformation. ii) Problems on rank and nullity.	3	Blackboard + Lecture + Hands on key
4.	Plotting of cylinder and cone using orthogonal curvilinear coordinates.	3	Blackboard + Lecture + Hands on key
5.	Plotting of sphere using orthogonal curvilinear coordinates.	3	Blackboard + Lecture + Hands on key
6.	Solutions to the problems on total and simultaneous differential equations.	3	Blackboard + Lecture + Hands on key
7.	Solutions to the problems on different types of Partial differential equations.	3	Blackboard + Lecture + Hands on key
8.	Solving second order linear partial differential equations in two variables with constant coefficient.	3	Blackboard + Lecture + Hands on key
9.	Solving some more second order linear partial differential equations in two variables with constant coefficient.	3	Blackboard + Lecture + Hands o key
10.	Solution of one dimensional heat equation using Fourier series with Dirichlet condition.	3	Blackboard + Lecture + Hands c key
11.	Solution of one dimensional heat equation using Fourier series with Neumann condition.	3	Blackboard + Lecture + Hands key

12.	Solution of one dimensional wave equation using Fourier series with Dirichlet condition.	3	Blackboard + Lecture + Hands on key
13.	Solution of one dimensional wave equation using Fourier series with Neumann condition.	3	Blackboard + Lecture + Hands on key
14.	REPETITION	3	Hands on key
	PRACTICAL INTERNAL TEST - 02/07/2022		

Paper VIII

Total Hours : 54

THEORY

Sl. No.	Topic covered	No. of Lecture Hours	Methodology	Date	Initials
	Analysis III – Complex analysis				
1.	Introduction – Definition, Modulus – Argument form or Polar standard form or Trigonometric form of a complex number	1	Lecture + interaction	17/05/2022	PL
2.	Equation of a straight line , Basic definitions, Limit of a function	1	Blackboard+ Interaction	18/05/2022	PL
3.	Continuity of a function of a complex variable, Differentiability of a function of a complex variable	2	Blackboard+ Interaction	24/05/2022 25/05/2022	PL
4.	Introduction to Analytic functions , The necessary and sufficient conditions for $f(z)$ to be analytic and problems	3	Blackboard+ Interaction	30/05/2022	PL
5.	Polar form of Cauchy-Riemann equations and problems	2	Blackboard+ Interaction	31/05/2022 07/06/2022	PL
6.	Orthogonal system	1	Blackboard+ Interaction	08/06/2022	PL
7.	Harmonic functions	1	Blackboard+ Interaction	14/06/2022	PL
8.	Construction of analytic functions by Milne-Thomson method	3	Blackboard+ Interaction	15/06/2022 21/06/2022 22/06/2022	PL
9.	Complex integration	1	Blackboard+ Interaction	28/06/2022	PL
10.	Complex line integral	2	Blackboard+ Interaction	29/06/2022	PL
11.	Cauchy's integral theorem	1	Blackboard+ Interaction	05/07/2022	PL
12.	Consequence of Cauchy's integral theorem	1	Blackboard+ Interaction	06/07/2022	PL
13.	Cauchy's integral formula	1	Blackboard+ Interaction	12/07/2022	PL
14.	Generalized Cauchy's integral formula	3	Blackboard+ Interaction	13/07/2022 16/07/2022	PL
15.	Cauchy's inequality, Liouville's theorem, Fundamental theorem of Algebra	2	Blackboard+ Interaction	20/07/2022 26/07/2022	PL
16.	Transformations - Conformal mapping (or transformations)	1	Blackboard+ Interaction	02/08/2022	PL

17.	Some standard elementary transformations	2	Blackboard+ Interaction	03/08/2022	PL
18.	Special transformations	1	Blackboard+ Interaction	16/08/2022	PL
19.	The Bilinear transformation (or Mobius transformation) - Properties of Bilinear transformation	4	Blackboard+ Interaction	17/08/2022	PL
	Numerical methods – II				
1.	Introduction - Initial approximations	1	Lecture + interaction	16/05/2022	CS
2.	Method of successive bisection	2	Blackboard+ Interaction	23/05/2022	CS
3.	Method of False position (or Regula-Falsi method)	2	Blackboard+ Interaction	30/05/2022	CS
4.	Newton-Raphson method	2	Blackboard+ Interaction	06/06/2022	CS
5.	Numerical solutions of non-homogeneous systems of linear algebraic equations in 3 variables	1	Blackboard+ Interaction	13/06/2022	CS
6.	Jacobi Iteration method: (also known as Gauss-Jacobi's method)	2	Blackboard+ Interaction	20/06/2022	CS
7.	Gauss-Seidel method	2	Blackboard+ Interaction	25/06/2022	CS
8.	Computation of largest Eigen value of a square matrix by power method	2	Blackboard+ Interaction	27/06/2022	CS
9.	Numerical solution of ordinary differential equations	1	Blackboard+ Interaction	16/07/2022	CS
10.	Taylor's series method	1	Blackboard+ Interaction	01/08/2022	CS
11.	Euler's method	1	Blackboard+ Interaction	08/08/2022	CS
12.	Modified Euler's method	2	Blackboard+ Interaction	19/08/2022 24/08/2022	CS
13.	Runge - Kutta method of fourth order	2	Blackboard+ Interaction	24/08/2022	CS
	FIRST INTERNAL TEST - 29/07/2022				
	SECOND INTERNAL TEST - 28/08/2022				
	ASSIGNMENTS – Solving question bank and model question papers				

PL : PROF PUSHPALATHA A = 33 HOURS

CS : PROF CHAITANYASHREE S = 21 HOURS

PRACTICALS

Total Hours: 42

Sl. No	Topic covered	No. of Lecture Hours	Methodology
1	Some problems on Cauchy-Riemann equations (polar form).	3	Blackboard + Lecture + Hands on key
2	Implementation of Milne-Thomson method of constructing analytic functions (simple examples).	3	Blackboard + Lecture + Hands on key
3	Illustrating orthogonality of the surfaces obtained from the real and imaginary parts of an analytic function.	3	Blackboard + Lecture + Hands on key
4.	Verifying real and imaginary parts of an analytic function being harmonic (in polar coordinates).	3	Blackboard + Lecture + Hands on key
5.	Illustrating the angle preserving property in a transformation.	3	Blackboard + Lecture + Hands on key
6.	Illustrating that circles are transformed to circles by a bilinear transformation.	3	Blackboard + Lecture + Hands on key
7.	Examples connected with Cauchy's integral theorem.	3	Blackboard + Lecture + Hands on key
8.	Solving algebraic equation (Bisection method).	3	Blackboard + Lecture + Hands on key
9.	Solving algebraic equation (Regula-Falsi and Newton-Raphson methods).	3	Blackboard + Lecture + Hands on key
10.	Solving system of equations (Jacobi and Gauss-Seidel methods).	3	Blackboard + Lecture + Hands on key
11.	Solving for largest eigenvalue by Power method.	3	Blackboard + Lecture + Hands on key
12.	Solving ordinary differential equation by modified Euler's method.	3	Blackboard + Lecture + Hands on key
13.	Solving ordinary differential equation by Runge-Kutta method of 4th order.	3	Blackboard + Lecture + Hands on key
14.	REPETITION	3	Hands on key
	PRACTICAL INTERNAL TEST - 13/08/2022		

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