TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE NAGARKURNOOL(M)
LESSON PLAN FOR ACADAMIC YEAR 2017-18

DEPARTMENT OF MATHEMATICS
SEMESTER-I

NAME OF THE PAPER	MATHEMATICS-I
PAPER CODE	DSC – 1A
PAPER NAME	**Differential & Integral Calculus**
Learning Objective	The course is aimed at exposing the students to some basic notions in differential calculus
Learning Outcomes	Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point. 1) Compare and contrast the ideas of continuity and differentiability. 2) To inculcate to solve algebraic equations and inequalities involving the sequence root and modulus function 3) To able to calculate limits in inderminate forms by a repeated use of L' Hospital rule. 4) To know the claim rule and use it to find derivatives of composite functions. 5) To find maxima and minima, critical points and inflection points of functions and to determine the concavity of curves. 6) To able to evaluate integrals of rational functions by partial fractions.
Faculty Name	K VIJAY KUMAR
Academic year	2017-18 (Sem-1)
Groups	MPC & MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T+35 P)
Unit – I	Partial Differentiation:	Introduction Functions of two variables	Black board	3
		Neighbourhood of a point (a, b)	Black board	3
		Continuity of a Function of two variables	Black board	3
		Continuity at a point – Limit of a Function of two variables	Black board	3
		Partial Derivatives	Black board	3
		Geometrical representation of a function of two Variables – Homogeneous Functions.	Black board	3
Unit – II	Partial Differentiation:	Theorem on Total Differentials	Black board	2
		Composite Functions – Differentiation of Composite Functions	Black board	2
		Implicit Functions	Black board	2
		Equality of fxy(a b)and fyx (a b) – Taylor's theorem for a function of two variables	Black board	1
		Maxima and Minima of functions of two variables	Black board	2
		Lagrange's method of undetermined multipliers.	Black board	1
Unit – III	Curvature and Evolutes	Introduction – Definition of Curvature – Radius of Curvature	Black board	3
		Length of Arc as a Function, Derivative of arc – Radius of Curvature – Cartesian Equations – Newtonian Method – Centre of Curvature – Chord of Curvature.	Black board	10
			Black board	3
	Envelopes:	Evolutes and Involutes – Properties of the Evolutes.	Black board	4

Unit – IV	**Lengths of Plane Curves**	Introduction – Expression for the lengths of curves $y = f(x)$ – Expressions for the length of arcs $x = f(y)$; $x = f(t)$, $y = \varphi(t)$; $r = f(\theta)$.	Black board	
	Volumes and Surfaces of Revolution	Introduction – Expression for the volume obtained by revolving about either axis – Expression for the volume obtained by revolving about any line – Area of the surface of the frustum of a cone – Expression for the surface of revolution – Pappus Theorems – Surface of revolution.	Black board	

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE
NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2017-18

DEPARTMENT OF MATHEMATICS
SEMESTER-II

NAME OF THE PAPER	MATHEMATICS-II
PAPER CODE	DSC – 1B
PAPER NAME	Differential Equations
Learning Objective	1. Evaluate first order differential equations including separable, homogeneous, exact, and linear. 2. Show existence and uniqueness of solutions. 3. Solve second order and higher order linear differential equations. 4. Create and analyse mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. 5. Solve differential equations using variation of parameters 6. Solve linear systems of ordinary differential equations
Learning Outcomes	After the completion of the course, Students will be able to 1. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. 2. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. 3. Student will be introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. 4. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. 5. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
Faculty Name	K VIJAY KUMAR
GROUPS	MPC& MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T+35 P)
Unit – I	(Differential Equations of first order and first degree)	Introduction Differential Equations of first order and first degree	Black board	3
		Equations in which Variables are Separable	Black board	3
		Homogeneous Differential Equations	Black board	3
		Differential Equations Reducible to Homogeneous Form	Black board	3
		Linear Differential Equations	Black board	3
		Differential Equations Reducible to Linear Form	Black board	3
		Exact differential equations	Black board	3
		Integrating Factors	Black board	1
		Change in variables	Black board	2
		Total Differential Equations	Black board	4
		Simultaneous Total Differential Equations	Black board	1
		Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Black board	2
	Differential Equations first order but not of	Equations Solvable for p	Black board	2
		– Equations Solvable for y	Black board	2
		Equations Solvable for x	Black board	2
		Equations that do not contain x (or y)	Black board	1

Unit – I	first degree	Equations Homogeneous in x and y	Black board	2
		Equations of the First Degree in x and y	Black board	1
		Clairaut's equation.	Black board	1
	Applications of First Order Differential Equations:	Growth and Decay	Black board	2
		Dynamics of Tumour Growth	Black board	2
		Radioactivity and Carbon Dating	Black board	2
		Compound Interest	Black board	1
		Orthogonal Trajectories	Black board	2
Unit – III	Higher order Linear Differential Equations:	Solution of homogeneous linear differential equations with constant coefficients	Black board	3
		Solution of non-homogeneous differential equations P(D) y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ax , bsinax/bcosax, bxk , Veax	Black board	10
		Method of undetermined coefficients.	Black board	2
Unit – IV	Higher order Linear Differential Equations	Method of variation of parameters	Black board	3
		Linear differential equations with non-constant coefficients	Black board	2
		The Cauchy – Euler Equation –	Black board	2
		Legendre's Linear Equations	Black board	3

		Miscellaneous Differential Equations.	Black board	2
	Partial Differential Equations	Formation and solution – Equations easily integrable	Black board	4
		Linear equations of first order.	Black board	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE(M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2018-19

DEPARTMENT OF MATHEMATICS
SEMESTER-I

NAME OF THE PAPER	MATHEMATICS-I
PAPER CODE	DSC – 1A
PAPER NAME	**Differential & Integral Calculus**
Learning Objective	The course is aimed at exposing the students to some basic notions in differential calculus
Learning Outcomes	Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point. 1) Compare and contrast the ideas of continuity and differentiability. 2) To inculcate to solve algebraic equations and inequalities involving the sequence root and modulus function 3) To able to calculate limits in indeterminate forms by a repeated use of L' Hospital rule. 4) To know the claim rule and use it to find derivatives of composite functions. 5) To find maxima and minima, critical points and inflection points of functions and to determine the concavity of curves. 6) To able to evaluate integrals of rational functions by partial fractions.
Faculty Name	RAVI KANDI
Academic year	2017-18 (Sem-1)
Groups	MPC & MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit – I	Partial Differentiation:	Introduction Functions of two variables	Black board	3
		Neighbourhood of a point (a, b)	Black board	3
		Continuity of a Function of two variables	Black board	3
		Continuity at a point – Limit of a Function of two variables	Black board	3
		Partial Derivatives	Black board	3
		Geometrical representation of a function of two Variables – Homogeneous Functions.	Black board	3
Unit – II	Partial Differentiation:	Theorem on Total Differentials	Black board	2
		Composite Functions – Differentiation of Composite Functions	Black board	2
		Implicit Functions	Black board	2
		Equality of fxy(a b)and fyx (a b) – Taylor's theorem for a function of two variables	Black board	1
		Maxima and Minima of functions of two variables	Black board	2
		Lagrange's method of undetermined multipliers.	Black board	1
Unit – III	Curvature and Evolutes	Introduction – Definition of Curvature – Radius of Curvature	Black board	3
		Length of Arc as a Function, Derivative of arc – Radius of Curvature – Cartesian Equations – Newtonian Method – Centre of Curvature – Chord of Curvature.	Black board	10
			Black board	3

	Envelopes:	Evolutes and Involutes – Properties of the Evolutes.	Black board	4
Unit – IV	**Lengths of Plane Curves**	Introduction – Expression for the lengths of curves $y = f(x)$ – Expressions for the length of arcs $x = f(y)$; $x = f(t)$, $y = \varphi(t)$; $r = f(\theta)$.	Black board	
	Volumes and Surfaces of Revolution	Introduction – Expression for the volume obtained by revolving about either axis – Expression for the volume obtained by revolving about any line – Area of the surface of the frustum of a cone – Expression for the surface of revolution – Pappus Theorems – Surface of revolution.	Black board	

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE(M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2018-19

DEPARTMENT OF MATHEMATICS
SEMESTER-II

NAME OF THE PAPER	MATHEMATICS-II
PAPER CODE	DSC – 1B
PAPER NAME	**Differential Equations**
Learning Objective	1. Evaluate first order differential equations including separable, homogeneous, exact, and linear. 2. Show existence and uniqueness of solutions. 3. Solve second order and higher order linear differential equations. 4. Create and analyse mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. 5. Solve differential equations using variation of parameters 6. Solve linear systems of ordinary differential equations
Learning Outcomes	After the completion of the course, Students will be able to 1. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. 2. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. 3. Student will be introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. 4. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. 5. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
Faculty Name	RAVI KANDI
GROUPS	MPC& MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit – I	(Differential Equations of first order and first degree)	Introduction Differential Equations of first order and first degree	Black board	3
		Equations in which Variables are Separable	Black board	3
		Homogeneous Differential Equations	Black board	3
		Differential Equations Reducible to Homogeneous Form	Black board	3
		Linear Differential Equations	Black board	3
		Differential Equations Reducible to Linear Form	Black board	3
		Exact differential equations	Black board	3
		Integrating Factors	Black board	1
		Change in variables	Black board	2
		Total Differential Equations	Black board	4
		Simultaneous Total Differential Equations	Black board	1
		Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Black board	2
		Equations Solvable for p	Black board	2
		– Equations Solvable for y	Black board	2
		Equations Solvable for x	Black board	2

Unit – I	Differential Equations first order but not of first degree	Equations that do not contain x (or y)	Black board	1
		Equations Homogeneous in x and y	Black board	2
		Equations of the First Degree in x and y	Black board	1
		Clairaut's equation.	Black board	1
	Applications of First Order Differential Equations:	Growth and Decay	Black board	2
		Dynamics of Tumour Growth	Black board	2
		Radioactivity and Carbon Dating	Black board	2
		Compound Interest	Black board	1
		Orthogonal Trajectories	Black board	2
Unit – III	Higher order Linear Differential Equations:	Solution of homogeneous linear differential equations with constant coefficients	Black board	3
		Solution of non-homogeneous differential equations P(D) y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ax , bsin ax/bcos ax, bxk , Ve ax	Black board	10
		Method of undetermined coefficients.	Black board	2
	Higher order Linear Differential Equations	Method of variation of parameters	Black board	3
		Linear differential equations with non-constant coefficients	Black board	2
		The Cauchy – Euler Equation –	Black board	2

Unit – IV		Legendre's Linear Equations	Black board	3
		Miscellaneous Differential Equations.	Black board	2
	Partial Differential Equations	Formation and solution – Equations easily integrable	Black board	4
		Linear equations of first order.	Black board	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE(M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2018-19

DEPARTMENT OF MATHEMATICS
SEMESTER-III

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSC – 1C
PAPER NAME	REAL ANALYSIS-III
Learning Objective	he student will: 1. Define the real numbers, least upper bounds, and the triangle inequality. 2. Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences. 3. Calculate the limit superior, limit inferior, and the limit of a sequence. 4. Recognize alternating, convergent, conditionally and absolutely convergent series. 5. Determine if subsets of a metric space are open, closed, connected, bounded, totally bounded and/or compact. 6. Determine if a function on a metric space is discontinuous, continuous, or uniformly continuous
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. describe fundamental properties of the real numbers that lead to the formal development of real analysis. 2. comprehend rigorous arguments developing the theory underpinning real analysis. 3. demonstrate an understanding of limits and how they are used in sequences, series, differentiation and integration. 4. construct rigorous mathematical proofs of basic results in real analysis. 5. appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.
Faculty Name	G RAVI
Groups	MPC & MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
UNIT -1	INTRODUCTION OF SEQUENCES	Sequences :Limits of Sequences	Black board	4
		A Discussion about Proofs – Limit Theorems for Sequences	Black board	4
		Monotone Sequences and Cauchy Sequences	Black board	3
		Subsequences	Youtube vedios and black board	3
		Lim sup's and Lim inf's	black board	5
		– Series	Black board	10
		Alternating Series and Integral Tests .	Seminor and blackboard	5
Unit – II	INTRODUCTION OF CONTINUITY	Continuity: Continuous Function	Blackboard with PPT presentation	5
		Properties of Continuous FunctionS	Black board	7
		Uniform Continuity –	Black board	8
		Limits of Functions	Black board	8
Unit – III	Differentiation	Basic Properties of the Derivatives	Black board	
		– The Mean Value Theorem	Black board	
		L'Hospital Rule –	Black board	
		– Taylor's Theorem	Black board	
Unit – IV	INTRODUCTION Integration:	The Riemann Integral	Black board	8
		Properties of Riemann Integral	Black board	8
		– Fundamental Theorem of Calculus.	Black board	7
		The Riemann Integral	Black board	8

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE(M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2018-19

DEPARTMENT OF MATHEMATICS
SEMESTER-IV

PAPER CODE	DSC – 1D
PAPER NAME	Algebra
Learning Objective	1. Present the relationships between abstract algebraic structures with familiar numbers systems such as the integers and real numbers. 2. Present concepts of and the relationships between operations satisfying various properties (e.g. commutative property). 3. Present concepts and properties of various algebraic structures. 4. Discuss the importance of algebraic properties relative to working within various number systems. 5. Develop the ability to form and evaluate conjectures
Learning Outcomes	After the completion of the course, Students will be able to 1. Understand the importance of algebraic properties with regard to working within various number systems. 2. Extend group structure to finite permutation groups (Cayley's Theorem). 3. Generate groups given specific conditions. 4. Investigate symmetry using group theory. 5. Understand the three major concrete models of Boolean algebra: the algebra of sets, the algebra of electrical circuits, and the algebra of logic.
Faculty Name	G RAVI
Groups	MPC& MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit – I	Groups	Definition and Examples of Groups –	Black board	3
		Elementary Properties of Groups	Black board	3
		Finite Groups Subgroups Terminology and Notation	Black board	3
		Subgroup Tests – Examples of Subgroups.	Black board	3
	Cyclic Groups	Properties of Cyclic Groups – Classification of Subgroups Cyclic Groups.	Black board	2
Unit – II	Permutation Groups	Definition and Notation – Cycle Notation – Properties of Permutations – A Check Digit Scheme Based on D5.	Black board	3
		Isomorphism's; Motivation – Definition and Examples – Cayley's Theorem Properties of Isomorphism's – Auto morphisms – Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball.	Black board	10
			Black board	3
		Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball..	Black board	4

Unit – III	Normal Subgroups and Factor Groups	Normal Subgroups – Factor Groups – Applications of Factor Groups – Group Homomorphism's – Definition and Examples – Properties of Homomorphism's – The First Isomorphism Theorem.	Black board	
	Introduction to Rings	Motivation and Definition – Examples of Rings – Properties of Rings – Subrings.	Black board	
	Integral Domains	Definition and Examples – Fields – Characteristics of a Ring.	Black board	
Unit-IV	Ideals and Factor Rings:	Ideals – Factor Rings – Prime Ideals and Maximal Ideals	Black board	
	Ring Homomorphisms	Definition and Examples – Properties of Ring – Homomorphisms	Black board	

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE(M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2019-20

DEPARTMENT OF MATHEMATICS
SEMESTER-I

NAME OF THE PAPER	MATHEMATICS-I
PAPER CODE	DSC – 1A
PAPER NAME	**Differential & Integral Calculus**
Learning Objective	The course is aimed at exposing the students to some basic notions in differential calculus
Learning Outcomes	Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point. 1) Compare and contrast the ideas of continuity and differentiability. 2) To inculcate to solve algebraic equations and inequalities involving the sequence root and modulus function 3) To able to calculate limits in inderminate forms by a repeated use of L' Hospital rule. 4) To know the claim rule and use it to find derivatives of composite functions. 5) To find maxima and minima, critical points and inflection points of functions and to determine the concavity of curves. 6) To able to evaluate integrals of rational functions by partial fractions.
Faculty Name	RAVI KANDI
Academic year	2019-20 (Sem-1)
Groups	MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50 T+35 P)
Unit – I	Partial Differentiation:	Introduction Functions of two variables	Black board	3
		Neighbourhood of a point (a, b)	Black board	3
		Continuity of a Function of two variables	Black board	3
		Continuity at a point – Limit of a Function of two variables	Black board	3
		Partial Derivatives	Black board	3
		Geometrical representation of a function of two Variables – Homogeneous Functions.	Black board	3
Unit – II	Partial Differentiation:	Theorem on Total Differentials	Black board	2
		Composite Functions – Differentiation of Composite Functions	Black board	2
		Implicit Functions	Black board	2
		Equality of fxy(a b)and fyx (a b) – Taylor's theorem for a function of two variables	Black board	1
		Maxima and Minima of functions of two variables	Black board	2
		Lagrange's method of undetermined multipliers.	Black board	1
Unit – III	Curvature and Evolutes	Introduction – Definition of Curvature – Radius of Curvature	Black board	3
		Length of Arc as a Function, Derivative of arc – Radius of Curvature – Cartesian Equations – Newtonian Method – Centre of Curvature – Chord of Curvature.	Black board	10
			Black board	3

	Envelopes:	Evolutes and Involutes – Properties of the Evolutes.	Black board	4
Unit – IV	**Lengths of Plane Curves**	Introduction – Expression for the lengths of curves $y = f(x)$ – Expressions for the length of arcs $x = f(y)$; $x = f(t)$, $y = \varphi(t)$; $r = f(\theta)$.	Black board	
	Volumes and Surfaces of Revolution	Introduction – Expression for the volume obtained by revolving about either axis – Expression for the volume obtained by revolving about any line – Area of the surface of the frustum of a cone – Expression for the surface of revolution – Pappus Theorems – Surface of revolution.	Black board	

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE(M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2019-20

DEPARTMENT OF MATHEMATICS
SEMESTER-II

NAME OF THE PAPER	MATHEMATICS-II
PAPER CODE	DSC – 1B
PAPER NAME	**Differential Equations**
Learning Objective	1. Evaluate first order differential equations including separable, homogeneous, exact, and linear. 2. Show existence and uniqueness of solutions. 3. Solve second order and higher order linear differential equations. 4. Create and analyse mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. 5. Solve differential equations using variation of parameters 6. Solve linear systems of ordinary differential equations
Learning Outcomes	After the completion of the course, Students will be able to 1. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. 2. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. 3. Student will be introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. 4. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. 5. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
Faculty Name	RAVI KANDI
GROUPS	MPC& MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
Unit – I	(Differential Equations of first order and first degree)	Introduction Differential Equations of first order and first degree	Black board	3
		Equations in which Variables are Separable	Black board	3
		Homogeneous Differential Equations	Black board	3
		Differential Equations Reducible to Homogeneous Form	Black board	3
		Linear Differential Equations	Black board	3
		Differential Equations Reducible to Linear Form	Black board	3
		Exact differential equations	Black board	3
		Integrating Factors	Black board	1
		Change in variables	Black board	2
		Total Differential Equations	Black board	4
		Simultaneous Total Differential Equations	Black board	1
		Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Black board	2
		Equations Solvable for p	Black board	2
		– Equations Solvable for y	Black board	2
		Equations Solvable for x	Black board	2

Unit – I	Differential Equations first order but not of first degree	Equations that do not contain x (or y)	Black board	1
		Equations Homogeneous in x and y	Black board	2
		Equations of the First Degree in x and y	Black board	1
		Clairaut's equation.	Black board	1
	Applications of First Order Differential Equations:	Growth and Decay	Black board	2
		Dynamics of Tumour Growth	Black board	2
		Radioactivity and Carbon Dating	Black board	2
		Compound Interest	Black board	1
		Orthogonal Trajectories	Black board	2
Unit – III	Higher order Linear Differential Equations:	Solution of homogeneous linear differential equations with constant coefficients	Black board	3
		Solution of non-homogeneous differential equations P(D) y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ax , bsin ax/bcos ax, bxk , Ve ax	Black board	10
		Method of undetermined coefficients.	Black board	2
	Higher order Linear Differential Equations	Method of variation of parameters	Black board	3
		Linear differential equations with non-constant coefficients	Black board	2
		The Cauchy – Euler Equation –	Black board	2

Unit – IV		Legendre's Linear Equations	Black board	3
		Miscellaneous Differential Equations.	Black board	2
	Partial Differential Equations	Formation and solution – Equations easily integrable	Black board	4
		Linear equations of first order.	Black board	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE(M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2019-20

DEPARTMENT OF MATHEMATICS
SEMESTER-III

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSC – 1C
PAPER NAME	REAL ANALYSIS-III
Learning Objective	The student will: 1. Define the real numbers, least upper bounds, and the triangle inequality. 2. Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences. 3. Calculate the limit superior, limit inferior, and the limit of a sequence. 4. Recognize alternating, convergent, conditionally and absolutely convergent series. 5. Determine if subsets of a metric space are open, closed, connected, bounded, totally bounded and/or compact. 6. Determine if a function on a metric space is discontinuous, continuous, or uniformly continuous.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Describe fundamental properties of the real numbers that lead to the formal development of real analysis. 2. Comprehend rigorous arguments developing the theory underpinning real analysis. 3. Demonstrate an understanding of limits and how they are used in sequences, series, differentiation and integration. 4. Construct rigorous mathematical proofs of basic results in real analysis. 5. Appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.
Faculty Name	G.RAVI & S.SUNEELA
Groups	MPC & MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
UNIT -I	INTRODUCTION OF SEQUENCES	Sequences:Limits of Sequences	Black board	4
		A Discussion about Proofs – Limit Theorems for Sequences	Black board	4
		Monotone Sequences and Cauchy Sequences	Black board	3
		Subsequences	Youtube vedios and black board	3
		Lim sup's and Lim inf's	black board	5
		– Series	Black board	10
		Alternating Series and Integral Tests .	Seminor and blackboard	5
Unit – II	INTRODUCTION OF CONTINUITY	Continuity: Continuous Function	Blackboard with PPT presentation	5
		Properties of Continuous FunctionS	Black board	7
		Uniform Continuity –	Black board	8
		Limits of Functions	Black board	8
Unit – III	Differentiation	Basic Properties of the Derivatives	Black board	
		– The Mean Value Theorem	Black board	
		L'Hospital Rule –	Black board	
		– Taylor's Theorem	Black board	
Unit – IV	INTRODUCTIONI ntegration:	The Riemann Integral	Black board	8
		Properties of Riemann Integral	Black board	8
		– Fundamental Theorem of Calculus.	Black board	7
		The Riemann Integral	Black board	8

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE(M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2019-20

DEPARTMENT OF MATHEMATICS
SEMESTER-IV

PAPER CODE	DSC – 1D
PAPER NAME	Algebra
Learning Objective	1. Present the relationships between abstract algebraic structures with familiar numbers systems such as the integers and real numbers. 2. Present concepts of and the relationships between operations satisfying various properties (e.g. commutative property). 3. Present concepts and properties of various algebraic structures. 4. Discuss the importance of algebraic properties relative to working within various number systems. 5. Develop the ability to form and evaluate conjectures
Learning Outcomes	After the completion of the course, Students will be able to 1. Understand the importance of algebraic properties with regard to working within various number systems. 2. Extend group structure to finite permutation groups (Cayley's Theorem). 3. Generate groups given specific conditions. 4. Investigate symmetry using group theory. 5. Understand the three major concrete models of Boolean algebra: the algebra of sets, the algebra of electrical circuits, and the algebra of logic.
Faculty Name	G RAVI & S.SUNEELA
Groups	MPC& MPCS

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50 T+35 P)
Unit – I	Groups	Definition and Examples of Groups –	Black board	3
		Elementary Properties of Groups	Black board	3
		Finite Groups Subgroups Terminology and Notation	Black board	3
		Subgroup Tests – Examples of Subgroups.	Black board	3
	Cyclic Groups	Properties of Cyclic Groups – Classification of Subgroups Cyclic Groups.	Black board	2
Unit – II	Permutation Groups	Definition and Notation – Cycle Notation – Properties of Permutations – A Check Digit Scheme Based on D5.	Black board	3
		Isomorphism's; Motivation – Definition and Examples – Cayley's Theorem Properties of Isomorphism's – Auto morphisms – Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball.	Black board	10
			Black board	3
		Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball..	Black board	4

Unit – III	Normal Subgroups and Factor Groups	Normal Subgroups – Factor Groups – Applications of Factor Groups – Group Homomorphism's – Definition and Examples – Properties of Homomorphism's – The First Isomorphism Theorem.	Black board	
	Introduction to Rings	Motivation and Definition – Examples of Rings – Properties of Rings – Subrings.	Black board	
	Integral Domains	Definition and Examples – Fields – Characteristics of a Ring.	Black board	
Unit-IV	Ideals and Factor Rings:	Ideals – Factor Rings – Prime Ideals and Maximal Ideals	Black board	
	Ring Homomorphisms	Definition and Examples – Properties of Ring – Homomorphisms	Black board	

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2019-20

DEPARTMENT OF MATHEMATICS
SEMESTER-V
Paper –V

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSC – E
PAPER NAME	Linear Algebra
Learning Objective	1.Solve systems of linear equations, 2. Analyze vectors in R^n geometrically and algebraically, 3. Recognize the concepts of the terms span, linear independence, basis, and dimension, and apply these concepts to various vector spaces and subspaces, 4. Use matrix algebra and the related matrices to linear transformations, 5. Compute and use determinants, 6. Compute and use eigenvectors and eigenvalues 7. Determine and use orthogonality, and 8. Use technological tools such as computer algebra systems or graphing calculators for visualization and calculation of linear algebra concepts.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Identify and construct linear transformations of a matrix. 2. Characterize linear transformations as onto, one-to-one. 3. Solve linear systems represented as linear transforms. 4. Express linear transforms in other forms, such as as matrix equations, and vector equations. 5. Characterize a set of vectors and linear systems using the concept of linear independence
FACULTY NAME	S SUNEELA
Groups	MPC & MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T+35P)
UNIT -I	Vector Spaces	: Vector Spaces and Subspaces	Black board	4
		– Null Spaces,	Black board	4
		Column Spaces	Black board	3
		Linear Transformations	Youtube vedios and black board	3
		Linearly Independent	black board	5
		; Bases –	Black board	10
		Coordinate Systems	Seminor and blackboard	5
		The Dimension of a Vector Space	Blackboard with PPT presentation	5
Unit – II:	Rank & Nullity	Rank – Nullity	Black board	7
		Change of Basis	Black board	8
		Eigen values and Eigenvectors	Black board	8
		The Characteristic Equation	Youtube classes & blackboard	8
UNIT-III	DIAGONALISATION	DIAGONALISATION	Black board	5
		Definition of eigen vetors ,examples ,problems.thorems on linear transformation	Black board	7
		Definition of complex eigen values,examples ,problems,theorems	Black board	8
UNIT-IV	UNIT-IV:INTRODUCTION	Applications to differential equations	Black board	7
		Orthogonality of vectors problems,properties,theorem Orthogonality of vectors problems,properties,theorem	Black board	7
	INNER PRODUCT SPACE	Orthogonal sets problems,theorems	Black board	6
			Black board	7

		Orthogonal projections problems and theorems	and seminor	
		The gram scmidth-orthogonaisation proces	Black board and youtube	6

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2019-20

DEPARTMENT OF MATHEMATICS
SEMESTER-V
Paper –VI

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSE – 1F/C
PAPER NAME	Solid geometry
Learning Objective	To get basic knowledge about Circle, Cone, Parabola, Hyperbola, Ellipse etc. 2. To understand the concepts & advance topics related to two & three dimensional geometry. 3. To study the applications of conics. 4. To study the application of Sphere, cone and cylinder. 5. To study how to trace the curve.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Understand geometrical terminology for angles, triangles, quadrilaterals and circles. 2. Measure angles using a protractor. 3. Use geometrical results to determine unknown angles. 4. Recognise line and rotational symmetries. 5. Find the areas of triangles, quadrilaterals and circles and shapes based on these.
FACULTY NAME	G RAVI
Groups	MPC &MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
Unit -I	INTRODUCTION Sphere	The Sphere Through Four Given Points	Black board	6
		Equations of a Circle	Black board	7
		Intersection of a Sphere and a Line –	Black board	8
		Equation of a Tangent Plane	Youtube vedios and black board	8
		Angle of Intersection of Two	black board	6

		Spheres		
Unit – II:	Cones and Cylinders	– Condition that the General Equation of second degreeRepresents a Cone –	Black board	10
		Cone and a Plane through its Vertex –	Seminor and blackboard	12
		– Intersection of a Line with a Cone	Blackboard with PPT presentatation	8
Unit – III:	Cones and cylinders	The Right Circular Cone	Black board	10
		The Cylinder	Black board	10
		– The Right Circular Cylinder	Black board	10
Unit – IV	The Concoid	The General Equation of the Second Degree	Youtube classes & blackboard	8
		Intersection of Line with a Conicoid	Black board	8
		Plane of contact	Black board	8
		Enveloping Cone and Cylinder.	Black board	10

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE(M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2019-20

DEPARTMENT OF MATHEMATICS
SEMESTER-VI
Paper –VII

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSE VI(A)
PAPER NAME	Numerical Analysis
Learning Objective	1. The course will also develop an understanding of the elements of error analysis for numerical methods and certain proofs. 2. The main objective of this course is to provide students with an introduction to the field of numerical analysis. 3. Derive appropriate numerical methods to solve interpolation based problems. 4. Derive appropriate numerical methods to solve probability based problems. 5. Prove results for various numerical root finding methods.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Understand the theoretical and practical aspects of the use of numerical analysis. 2. Proficient in implementing numerical methods for a variety of multidisciplinary applications. 3. Establish the limitations, advantages, and disadvantages of numerical analysis. 4. Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations. 5. Understand of common numerical analysis and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.
FACULTY NAME	S. SUNEELA
Groups	MPC & MPCS

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
Unit -I	Graphic representation of a polynomial	Maxima and minima values of polynomials	Black board	2
		Theorems relating to the real roots of equations	Black board	3
		Existence of a root in the general equation	Black board	3
		Imaginary roots – Theorem determining the number of roots of an equation –	Youtube vedios and black board	4
		Equal roots – Imaginary roots enter equations in pairs –	black board	4
		– Descartes' rule of signs for negative roots	Black board	4
Unit – II:	Relations between the roots and coefficient	Relations between the roots and coefficient	Seminor and blackboard	4
		Applications of the theorem	Blackboard with PPT presentatation	2
		Depression of an equation when a relation exists between two of its roots –		4
		The cube roots of unity Symmetric functions of the roots		4
		– Lagrange's Interpolation Polynomial –		4
		Divided Differences		4
		Newton's General Interpolation formula		4
		Inverse Interpolation.		4
	Curve Fitting	Least Square Curve Fitting: Fitting a Straight Line		5
		Nonlinear Curve Fitting.	Black board	5
		Numerical Differentiation and Integration: Numerical Differentiation	Black board	5
		Numerical Integration:	Black board	5
		Trapezoidal Rule –	Black board	5

Unit – III:		Simpson's 1/3rd	Black board	5
		Rule and Simpson's 3/8th – Rule	Black board	5
		Boole's 15 and Weddle's Rule –	Black board	5
		Newton's Cotes Integration Formulae	Black board Black board	5
Unit – IV:	Numerical Solutions of Ordinary Differential Equations	Numerical Solutions of Ordinary Differential Equations	Black board	5
		Taylor's Series Method	Black board	5
		Picard's Method	Black board	5
		Euler's Methods	Black board	5
		Runge Kutta Methods.	Black board	5

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE(M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2019-20

DEPARTMENT OF MATHEMATICS
SEMESTER-VI
Paper –VIII

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSE-1F/B
PAPER NAME	Vector Calculus
LEARNING OUTCOMES	: Students realize the way vector calculus is used to addresses some of the problems of physics.
FACULTY NAME	G RAVI

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
UNIT -I	Line Integrals: Introductory Example	Line Integrals: Introductory Example	Black board	4
		Work done against a Force	Black board	4
		Evaluation of Line Integrals Conservative Vector Fields	Black board	3
		-Surface Integrals:	Youtube vedios and black board	3
		: Introductory Example: Flow Through a Pipe Evaluation of Surface Integrals. U	black board	5
Unit- II		Volume Integrals: Evaluation of Volume integrals	Black board	10
		Gradient	Seminor and blackboard	5
		Divergence and CurL	Blackboard with PPT presentation	5
		Partial differentiation and Taylor series	Black board	7
		Partial differentiationTaylor series in more than one variable	Black board	8
		Gradient of a scalar	Black board	8

		field-Gradients,		
		conservative fields and potentials	Youtube classes & blackboard	8
		Physical applications of the gradient.	Black board	5
Unit- III	Divergence of a vector field	Divergence of a vector field	Black board	7
		Physical interpretation of divergence	Black board	8
		-Laplacian of a scalar field	Black board	7
		Curl of a vector field-	Black board	4
		Physical interpretation of curl- Relation between curl and rotation	Black board	7
		Curl and conservative vector fields	Black board	6

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2020-21

DEPARTMENT OF MATHEMATICS
SEMESTER-I

NAME OF THE PAPER	MATHEMATICS-I
PAPER CODE	DSC – 1A
PAPER NAME	**Differential & Integral Calculus**
Learning Objective	The course is aimed at exposing the students to some basic notions in differential calculus
Learning Outcomes	Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point. 1) Compare and contrast the ideas of continuity and differentiability. 2) To inculcate to solve algebraic equations and inequalities involving the sequence root and modulus function 3) To able to calculate limits in inderminate forms by a repeated use of L' Hospital rule. 4) To know the claim rule and use it to find derivatives of composite functions. 5) To find maxima and minima, critical points and inflection points of functions and to determine the concavity of curves. 6) To able to evaluate integrals of rational functions by partial fractions.
Faculty Name	B SHIVA PRASAD
Academic year	2021-22 (Sem-1)
Groups	MPC & MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50 T+35 P)
Unit – I	Partial Differentiation:	Introduction Functions of two variables	Black board	3
		Neighbourhood of a point (a, b)	Black board	3
		Continuity of a Function of two variables	Black board	3
		Continuity at a point – Limit of a Function of two variables	Black board	3
		Partial Derivatives	Black board	3
		Geometrical representation of a function of two Variables – Homogeneous Functions.	Black board	3
Unit – II	Partial Differentiation:	Theorem on Total Differentials	Black board	2
		Composite Functions – Differentiation of Composite Functions	Black board	2
		Implicit Functions	Black board	2
		Equality of fxy(a b)and fyx (a b) – Taylor's theorem for a function of two variables	Black board	1
		Maxima and Minima of functions of two variables	Black board	2
		Lagrange's method of undetermined multipliers.	Black board	1
Unit – III	Curvature and Evolutes	Introduction – Definition of Curvature – Radius of Curvature	Black board	3
		Length of Arc as a Function, Derivative of arc – Radius of Curvature – Cartesian Equations – Newtonian Method – Centre of Curvature – Chord of Curvature.	Black board	10
			Black board	3

	Envelopes:	Evolutes and Involutes – Properties of the Evolutes.	Black board	4
Unit – IV	**Lengths of Plane Curves**	Introduction – Expression for the lengths of curves $y = f(x)$ – Expressions for the length of arcs $x = f(y)$; $x = f(t)$, $y = \varphi(t)$; $r = f(\theta)$.	Black board	
	Volumes and Surfaces of Revolution	Introduction – Expression for the volume obtained by revolving about either axis – Expression for the volume obtained by revolving about any line – Area of the surface of the frustum of a cone – Expression for the surface of revolution – Pappus Theorems – Surface of revolution.	Black board	

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2020-21

DEPARTMENT OF MATHEMATICS
SEMESTER-II

NAME OF THE PAPER	MATHEMATICS-II
PAPER CODE	DSC – 1B
PAPER NAME	**Differential Equations**
Learning Objective	1. Evaluate first order differential equations including separable, homogeneous, exact, and linear. 2. Show existence and uniqueness of solutions. 3. Solve second order and higher order linear differential equations. 4. Create and analyse mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. 5. Solve differential equations using variation of parameters 6. Solve linear systems of ordinary differential equations
Learning Outcomes	After the completion of the course, Students will be able to 1. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. 2. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. 3. Student will be introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. 4. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. 5. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
Faculty Name	B SHIVA PRASAD
GROUPS	MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
Unit – I	(Differential Equations of first order and first degree)	Introduction Differential Equations of first order and first degree	Black board	3
		Equations in which Variables are Separable	Black board	3
		Homogeneous Differential Equations	Black board	3
		Differential Equations Reducible to Homogeneous Form	Black board	3
		Linear Differential Equations	Black board	3
		Differential Equations Reducible to Linear Form	Black board	3
		Exact differential equations	Black board	3
		Integrating Factors	Black board	1
		Change in variables	Black board	2
		Total Differential Equations	Black board	4
		Simultaneous Total Differential Equations	Black board	1
		Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Black board	2
		Equations Solvable for p	Black board	2
		– Equations Solvable for y	Black board	2
		Equations Solvable for x	Black board	2

Unit – I	Differential Equations first order but not of first degree	Equations that do not contain x (or y)	Black board	1
		Equations Homogeneous in x and y	Black board	2
		Equations of the First Degree in x and y	Black board	1
		Clairaut's equation.	Black board	1
	Applications of First Order Differential Equations:	Growth and Decay	Black board	2
		Dynamics of Tumour Growth	Black board	2
		Radioactivity and Carbon Dating	Black board	2
		Compound Interest	Black board	1
		Orthogonal Trajectories	Black board	2
Unit – III	Higher order Linear Differential Equations:	Solution of homogeneous linear differential equations with constant coefficients	Black board	3
		Solution of non-homogeneous differential equations P(D) y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ax , bsin ax/bcos ax, bxk , Ve ax	Black board	10
		Method of undetermined coefficients.	Black board	2
	Higher order Linear Differential Equations	Method of variation of parameters	Black board	3
		Linear differential equations with non-constant coefficients	Black board	2
		The Cauchy – Euler Equation –	Black board	2

Unit – IV		Legendre's Linear Equations	Black board	3
		Miscellaneous Differential Equations.	Black board	2
	Partial Differential Equations	Formation and solution – Equations easily integrable	Black board	4
		Linear equations of first order.	Black board	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2020-21

DEPARTMENT OF MATHEMATICS
SEMESTER-II

NAME OF THE PAPER	MATHEMATICS-II
PAPER CODE	DSC – 1B
PAPER NAME	**Differential Equations**
Learning Objective	1. Evaluate first order differential equations including separable, homogeneous, exact, and linear. 2. Show existence and uniqueness of solutions. 3. Solve second order and higher order linear differential equations. 4. Create and analyse mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. 5. Solve differential equations using variation of parameters 6. Solve linear systems of ordinary differential equations
Learning Outcomes	After the completion of the course, Students will be able to 1. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. 2. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. 3. Student will be introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. 4. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. 5. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
Faculty Name	B SHIVA PRASAD
GROUPS	MPC

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
Unit – I	(Differential Equations of first order and first degree)	Introduction Differential Equations of first order and first degree	Black board	3
		Equations in which Variables are Separable	Black board	3
		Homogeneous Differential Equations	Black board	3
		Differential Equations Reducible to Homogeneous Form	Black board	3
		Linear Differential Equations	Black board	3
		Differential Equations Reducible to Linear Form	Black board	3
		Exact differential equations	Black board	3
		Integrating Factors	Black board	1
		Change in variables	Black board	2
		Total Differential Equations	Black board	4
		Simultaneous Total Differential Equations	Black board	1
		Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Black board	2
		Equations Solvable for p	Black board	2
		– Equations Solvable for y	Black board	2
		Equations Solvable for x	Black board	2

Unit – I	Differential Equations first order but not of first degree	Equations that do not contain x (or y)	Black board	1
		Equations Homogeneous in x and y	Black board	2
		Equations of the First Degree in x and y	Black board	1
		Clairaut's equation.	Black board	1
	Applications of First Order Differential Equations:	Growth and Decay	Black board	2
		Dynamics of Tumour Growth	Black board	2
		Radioactivity and Carbon Dating	Black board	2
		Compound Interest	Black board	1
		Orthogonal Trajectories	Black board	2
Unit – III	Higher order Linear Differential Equations:	Solution of homogeneous linear differential equations with constant coefficients	Black board	3
		Solution of non-homogeneous differential equations P(D) y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ax , bsin ax/bcos ax, bxk , Ve ax	Black board	10
		Method of undetermined coefficients.	Black board	2
	Higher order Linear Differential Equations	Method of variation of parameters	Black board	3
		Linear differential equations with non-constant coefficients	Black board	2
		The Cauchy – Euler Equation –	Black board	2

Unit – IV		Legendre's Linear Equations	Black board	3
		Miscellaneous Differential Equations.	Black board	2
	Partial Differential Equations	Formation and solution – Equations easily integrable	Black board	4
		Linear equations of first order.	Black board	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2020-21

DEPARTMENT OF MATHEMATICS
SEMESTER-III

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSC – 1C
PAPER NAME	REAL ANALYSIS-III
Learning Objective	The student will: 1. Define the real numbers, least upper bounds, and the triangle inequality. 2. Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences. 3. Calculate the limit superior, limit inferior, and the limit of a sequence. 4. Recognize alternating, convergent, conditionally and absolutely convergent series. 5. Determine if subsets of a metric space are open, closed, connected, bounded, totally bounded and/or compact. 6. Determine if a function on a metric space is discontinuous, continuous, or uniformly continuous.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Describe fundamental properties of the real numbers that lead to the formal development of real analysis. 2. Comprehend rigorous arguments developing the theory underpinning real analysis. 3. Demonstrate an understanding of limits and how they are used in sequences, series, differentiation and integration. 4. Construct rigorous mathematical proofs of basic results in real analysis. 5. Appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.
Faculty Name	G RAVI
Groups	**MPCs**

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)

UNIT -I	INTRODUCTION OF SEQUENCES	Sequences:Limits of Sequences	Black board	4
		A Discussion about Proofs – Limit Theorems for Sequences	Black board	4
		Monotone Sequences and Cauchy Sequences	Black board	3
		Subsequences	Youtube vedios and black board	3
		Lim sup's and Lim inf's	black board	5
		– Series	Black board	10
		Alternating Series and Integral Tests .	Seminor and blackboard	5
Unit – II	INTRODUCTION OF CONTINUITY	Continuity: Continuous Function	Blackboard with PPT presentation	5
		Properties of Continuous FunctionS	Black board	7
		Uniform Continuity –	Black board	8
		Limits of Functions	Black board	8
Unit – III	Differentiation	Basic Properties of the Derivatives	Black board	
		– The Mean Value Theorem	Black board	
		L'Hospital Rule –	Black board	
		– Taylor's Theorem	Black board	
Unit – IV	INTRODUCTIONI ntegration:	The Riemann Integral	Black board	8
		Properties of Riemann Integral	Black board	8
		– Fundamental Theorem of Calculus.	Black board	7
		The Riemann Integral	Black board	8

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2020-21

DEPARTMENT OF MATHEMATICS
SEMESTER-III
SEC-I

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	SEC – III
PAPER NAME	Number Theory
LEARNING OUTCOMES	Student uses the knowledge acquired solving some divisor problems
FACULTY NAME	RAVI KANDI & G RAVI

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
Unit -I	The Goldbach conjecture	Basic properties of congruences	Black board	2
		Binary and Decimal Representation of Integers –	Black board	3
		Number Theoretic Functions	Black board	3
		The Sum and Number of divisors	Youtube vedios and black board	4
		The MobiusInversion Formula	black board	4
		The Greatest integer function.	Black board	4
Unit – II:	Euler's generalization of Fermat's Theorem	Euler's generalization of Fermat's Theorem	Seminor and blackboard	4
		Euler's Phi function	Blackboard with PPT presentatation	2
		Euler's theorem		4
		SomeProperties of the Euler's Phi function.	BLACK BOARD	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2020-21

DEPARTMENT OF MATHEMATICS
SEMESTER-IV

PAPER CODE	DSC – 1D
PAPER NAME	Algebra
Learning Objective	1. Present the relationships between abstract algebraic structures with familiar numbers systems such as the integers and real numbers. 2. Present concepts of and the relationships between operations satisfying various properties (e.g. commutative property). 3. Present concepts and properties of various algebraic structures. 4. Discuss the importance of algebraic properties relative to working within various number systems. 5. Develop the ability to form and evaluate conjectures
Learning Outcomes	After the completion of the course, Students will be able to 1. Understand the importance of algebraic properties with regard to working within various number systems. 2. Extend group structure to finite permutation groups (Cayley's Theorem). 3. Generate groups given specific conditions. 4. Investigate symmetry using group theory. 5. Understand the three major concrete models of Boolean algebra: the algebra of sets, the algebra of electrical circuits, and the algebra of logic.
Faculty Name	G RAVI
Groups	MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50 T+35 P)
Unit – I	Groups	Definition and Examples of Groups –	Black board	3
		Elementary Properties of Groups	Black board	3
		Finite Groups Subgroups Terminology and Notation	Black board	3
		Subgroup Tests – Examples of Subgroups.	Black board	3
	Cyclic Groups	Properties of Cyclic Groups – Classification of Subgroups Cyclic Groups.	Black board	2
Unit – II	Permutation Groups	Definition and Notation – Cycle Notation – Properties of Permutations – A Check Digit Scheme Based on D5.	Black board	3
		Isomorphism's; Motivation – Definition and Examples – Cayley's Theorem Properties of Isomorphism's – Auto morphisms – Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball.	Black board	10
		Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball..	Black board	3
			Black board	4

Unit – III	Normal Subgroups and Factor Groups	Normal Subgroups – Factor Groups – Applications of Factor Groups – Group Homomorphism's – Definition and Examples – Properties of Homomorphism's – The First Isomorphism Theorem.	Black board	
	Introduction to Rings	Motivation and Definition – Examples of Rings – Properties of Rings – Subrings.	Black board	
	Integral Domains	Definition and Examples – Fields – Characteristics of a Ring.	Black board	
Unit-IV	Ideals and Factor Rings:	Ideals – Factor Rings – Prime Ideals and Maximal Ideals	Black board	
	Ring Homomorphisms	Definition and Examples – Properties of Ring – Homomorphisms	Black board	

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2020-21

DEPARTMENT OF MATHEMATICS
SEMESTER-V
Paper –V

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSC – E
PAPER NAME	Linear Algebra
Learning Objective	1.Solve systems of linear equations, 2. Analyze vectors in R^n geometrically and algebraically, 3. Recognize the concepts of the terms span, linear independence, basis, and dimension, and apply these concepts to various vector spaces and subspaces, 4. Use matrix algebra and the related matrices to linear transformations, 5. Compute and use determinants, 6. Compute and use eigenvectors and eigenvalues 7. Determine and use orthogonality, and 8. Use technological tools such as computer algebra systems or graphing calculators for visualization and calculation of linear algebra concepts.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Identify and construct linear transformations of a matrix. 2. Characterize linear transformations as onto, one-to-one. 3. Solve linear systems represented as linear transforms. 4. Express linear transforms in other forms, such as as matrix equations, and vector equations. 5. Characterize a set of vectors and linear systems using the concept of linear independence
FACULTY NAME	G RAVI
Groups	MPC & MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T+35P)
UNIT -I	Vector Spaces	: Vector Spaces and Subspaces	Black board	4
		– Null Spaces,	Black board	4
		Column Spaces	Black board	3
		Linear Transformations	Youtube vedios and black board	3
		Linearly Independent	black board	5
		; Bases –	Black board	10
		Coordinate Systems	Seminor and blackboard	5
		The Dimension of a Vector Space	Blackboard with PPT presentation	5
Unit – II:	Rank & Nullity	Rank – Nullity	Black board	7
		Change of Basis	Black board	8
		Eigen values and Eigenvectors	Black board	8
		The Characteristic Equation	Youtube classes & blackboard	8
UNIT-III	DIAGONALISATION	DIAGONALISATION	Black board	5
		Definition of eigen vetors ,examples ,problems.thorems on linear transformation	Black board	7
		Definition of complex eigen values,examples ,problems,theorems	Black board	8
UNIT-IV	UNIT-IV:INTRODUCTION	Applications to differential equations	Black board	7
		Orthogonality of vectors problems,properties,theorem Orthogonality of vectors problems,properties,theorem	Black board	7
	INNER PRODUCT SPACE	Orthogonal sets problems,theorems	Black board	6
		Orthogonal projections problems and theorems	Black board and seminor	7

		The gram scmidth-orthogonaisation proces	*Black board and youtube*	*6*

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2020-21

DEPARTMENT OF MATHEMATICS
SEMESTER-VI
Paper –VI

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSE – 1F/C
PAPER NAME	Solid geometry
Learning Objective	To get basic knowledge about Circle, Cone, Parabola, Hyperbola, Ellipse etc. 2. To understand the concepts & advance topics related to two & three dimensional geometry. 3. To study the applications of conics. 4. To study the application of Sphere, cone and cylinder. 5. To study how to trace the curve.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Understand geometrical terminology for angles, triangles, quadrilaterals and circles. 2. Measure angles using a protractor. 3. Use geometrical results to determine unknown angles. 4. Recognise line and rotational symmetries. 5. Find the areas of triangles, quadrilaterals and circles and shapes based on these.
FACULTY NAME	RAVI KANDI
Groups	MPC &MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
Unit -I	INTRODUCTION Sphere	The Sphere Through Four Given Points	Black board	6
		Equations of a Circle	Black board	7
		Intersection of a Sphere and a Line –	Black board	8
		Equation of a Tangent Plane	Youtube vedios and black board	8
		Angle of Intersection of Two	black board	6

		Spheres		
Unit – II:	Cones and Cylinders	Condition that the General Equation of second degreeRepresents a Cone	Black board	10
		Cone and a Plane through its Vertex	Seminor and blackboard	12
		Intersection of a Line with a Cone	Blackboard with PPT presentatation	8
Unit – III:	Cones and cylinders	The Right Circular Cone	Black board	10
		The Cylinder	Black board	10
		The Right Circular Cylinder	Black board	10
Unit – IV	The Concoid	The General Equation of the Second Degree	Youtube classes & blackboard	8
		Intersection of Line with a Conicoid	Black board	8
		Plane of contact	Black board	8
		Enveloping Cone and Cylinder.	Black board	10

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2021-22

DEPARTMENT OF MATHEMATICS
SEMESTER-I

NAME OF THE PAPER	**MATHEMATICS-I**
PAPER CODE	DSC – 1A
PAPER NAME	**Differential & Integral Calculus**
Learning Objective	The course is aimed at exposing the students to some basic notions in differential calculus
Learning Outcomes	Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point. 1) Compare and contrast the ideas of continuity and differentiability. 2) To inculcate to solve algebraic equations and inequalities involving the sequence root and modulus function 3) To able to calculate limits in inderminate forms by a repeated use of L' Hospital rule. 4) To know the claim rule and use it to find derivatives of composite functions. 5) To find maxima and minima, critical points and inflection points of functions and to determine the concavity of curves. 6) To able to evaluate integrals of rational functions by partial fractions.
Faculty Name	RAVI KANDI & B SHIVA PRASAD
Academic year	2021-22 (Sem-1)
Groups	MPC & MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50 T+35 P)
Unit – I	Partial Differentiation:	Introduction Functions of two variables	Black board	3
		Neighbourhood of a point (a, b)	Black board	3
		Continuity of a Function of two variables	Black board	3
		Continuity at a point – Limit of a Function of two variables	Black board	3
		Partial Derivatives	Black board	3
		Geometrical representation of a function of two Variables – Homogeneous Functions.	Black board	3
Unit – II	Partial Differentiation:	Theorem on Total Differentials	Black board	2
		Composite Functions – Differentiation of Composite Functions	Black board	2
		Implicit Functions	Black board	2
		Equality of fxy(a b)and fyx (a b) – Taylor's theorem for a function of two variables	Black board	1
		Maxima and Minima of functions of two variables	Black board	2
		Lagrange's method of undetermined multipliers.	Black board	1
Unit – III	Curvature and Evolutes	Introduction – Definition of Curvature – Radius of Curvature	Black board	3
		Length of Arc as a Function, Derivative of arc – Radius of Curvature – Cartesian Equations – Newtonian Method – Centre of Curvature – Chord of Curvature.	Black board	10
			Black board	3

	Envelopes:	Evolutes and Involutes – Properties of the Evolutes.	Black board	4
Unit – IV	**Lengths of Plane Curves**	Introduction – Expression for the lengths of curves $y = f(x)$ – Expressions for the length of arcs $x = f(y)$; $x = f(t)$, $y = \varphi(t)$; $r = f(\theta)$.	Black board	
	Volumes and Surfaces of Revolution	Introduction – Expression for the volume obtained by revolving about either axis – Expression for the volume obtained by revolving about any line – Area of the surface of the frustum of a cone – Expression for the surface of revolution – Pappus Theorems – Surface of revolution.	Black board	

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2021-22

DEPARTMENT OF MATHEMATICS
SEMESTER-II

NAME OF THE PAPER	MATHEMATICS-II
PAPER CODE	DSC – 1B
PAPER NAME	**Differential Equations**
Learning Objective	1. Evaluate first order differential equations including separable, homogeneous, exact, and linear. 2. Show existence and uniqueness of solutions. 3. Solve second order and higher order linear differential equations. 4. Create and analyse mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. 5. Solve differential equations using variation of parameters 6. Solve linear systems of ordinary differential equations
Learning Outcomes	After the completion of the course, Students will be able to 1. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. 2. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. 3. Student will be introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. 4. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. 5. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
Faculty Name	RAVI KANDI
GROUPS	MPC

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
Unit – I	(Differential Equations of first order and first degree)	Introduction Differential Equations of first order and first degree	Black board	3
		Equations in which Variables are Separable	Black board	3
		Homogeneous Differential Equations	Black board	3
		Differential Equations Reducible to Homogeneous Form	Black board	3
		Linear Differential Equations	Black board	3
		Differential Equations Reducible to Linear Form	Black board	3
		Exact differential equations	Black board	3
		Integrating Factors	Black board	1
		Change in variables	Black board	2
		Total Differential Equations	Black board	4
		Simultaneous Total Differential Equations	Black board	1
		Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Black board	2
		Equations Solvable for p	Black board	2
		– Equations Solvable for y	Black board	2
		Equations Solvable for x	Black board	2

Unit – I	Differential Equations first order but not of first degree	Equations that do not contain x (or y)	Black board	1
		Equations Homogeneous in x and y	Black board	2
		Equations of the First Degree in x and y	Black board	1
		Clairaut's equation.	Black board	1
	Applications of First Order Differential Equations:	Growth and Decay	Black board	2
		Dynamics of Tumour Growth	Black board	2
		Radioactivity and Carbon Dating	Black board	2
		Compound Interest	Black board	1
		Orthogonal Trajectories	Black board	2
Unit – III	Higher order Linear Differential Equations:	Solution of homogeneous linear differential equations with constant coefficients	Black board	3
		Solution of non-homogeneous differential equations P(D) y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ax , bsin ax/bcos ax, bxk , Ve ax	Black board	10
		Method of undetermined coefficients.	Black board	2
	Higher order Linear Differential Equations	Method of variation of parameters	Black board	3
		Linear differential equations with non-constant coefficients	Black board	2
		The Cauchy – Euler Equation –	Black board	2

Unit – IV		Legendre's Linear Equations	Black board	3
		Miscellaneous Differential Equations.	Black board	2
	Partial Differential Equations	Formation and solution – Equations easily integrable	Black board	4
		Linear equations of first order.	Black board	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2021-22

DEPARTMENT OF MATHEMATICS
SEMESTER-II

NAME OF THE PAPER	MATHEMATICS-II
PAPER CODE	DSC – 1B
PAPER NAME	**Differential Equations**
Learning Objective	1. Evaluate first order differential equations including separable, homogeneous, exact, and linear. 2. Show existence and uniqueness of solutions. 3. Solve second order and higher order linear differential equations. 4. Create and analyse mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. 5. Solve differential equations using variation of parameters 6. Solve linear systems of ordinary differential equations
Learning Outcomes	After the completion of the course, Students will be able to 1. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. 2. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. 3. Student will be introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. 4. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. 5. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
Faculty Name	B SHIVA PRASAD
GROUPS	MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
Unit – I	(Differential Equations of first order and first degree)	Introduction Differential Equations of first order and first degree	Black board	3
		Equations in which Variables are Separable	Black board	3
		Homogeneous Differential Equations	Black board	3
		Differential Equations Reducible to Homogeneous Form	Black board	3
		Linear Differential Equations	Black board	3
		Differential Equations Reducible to Linear Form	Black board	3
		Exact differential equations	Black board	3
		Integrating Factors	Black board	1
		Change in variables	Black board	2
		Total Differential Equations	Black board	4
		Simultaneous Total Differential Equations	Black board	1
		Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Black board	2
		Equations Solvable for p	Black board	2
		– Equations Solvable for y	Black board	2
		Equations Solvable for x	Black board	2

Unit – I	Differential Equations first order but not of first degree	Equations that do not contain x (or y)	Black board	1
		Equations Homogeneous in x and y	Black board	2
		Equations of the First Degree in x and y	Black board	1
		Clairaut's equation.	Black board	1
	Applications of First Order Differential Equations:	Growth and Decay	Black board	2
		Dynamics of Tumour Growth	Black board	2
		Radioactivity and Carbon Dating	Black board	2
		Compound Interest	Black board	1
		Orthogonal Trajectories	Black board	2
Unit – III	Higher order Linear Differential Equations:	Solution of homogeneous linear differential equations with constant coefficients	Black board	3
		Solution of non-homogeneous differential equations P(D) y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ax , bsin ax/bcos ax, bxk , Ve ax	Black board	10
		Method of undetermined coefficients.	Black board	2
	Higher order Linear Differential Equations	Method of variation of parameters	Black board	3
		Linear differential equations with non-constant coefficients	Black board	2
		The Cauchy – Euler Equation –	Black board	2

Unit – IV		Legendre's Linear Equations	Black board	3
		Miscellaneous Differential Equations.	Black board	2
	Partial Differential Equations	Formation and solution – Equations easily integrable	Black board	4
		Linear equations of first order.	Black board	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2021-22

DEPARTMENT OF MATHEMATICS
SEMESTER-III

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSC – 1C
PAPER NAME	REAL ANALYSIS-III
Learning Objective	The student will: 1. Define the real numbers, least upper bounds, and the triangle inequality. 2. Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences. 3. Calculate the limit superior, limit inferior, and the limit of a sequence. 4. Recognize alternating, convergent, conditionally and absolutely convergent series. 5. Determine if subsets of a metric space are open, closed, connected, bounded, totally bounded and/or compact. 6. Determine if a function on a metric space is discontinuous, continuous, or uniformly continuous.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Describe fundamental properties of the real numbers that lead to the formal development of real analysis. 2. Comprehend rigorous arguments developing the theory underpinning real analysis. 3. Demonstrate an understanding of limits and how they are used in sequences, series, differentiation and integration. 4. Construct rigorous mathematical proofs of basic results in real analysis. 5. Appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.
Faculty Name	B SHIVA PRASAD
Groups	MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)

UNIT -I	INTRODUCTION OF SEQUENCES	Sequences:Limits of Sequences	Black board	4
		A Discussion about Proofs – Limit Theorems for Sequences	Black board	4
		Monotone Sequences and Cauchy Sequences	Black board	3
		Subsequences	Youtube vedios and black board	3
		Lim sup's and Lim inf's	black board	5
		– Series	Black board	10
		Alternating Series and Integral Tests .	Seminor and blackboard	5
Unit – II	INTRODUCTION OF CONTINUITY	Continuity: Continuous Function	Blackboard with PPT presentation	5
		Properties of Continuous FunctionS	Black board	7
		Uniform Continuity –	Black board	8
		Limits of Functions	Black board	8
Unit – III	Differentiation	Basic Properties of the Derivatives	Black board	
		– The Mean Value Theorem	Black board	
		L'Hospital Rule –	Black board	
		– Taylor's Theorem	Black board	
Unit – IV	INTRODUCTIONI ntegration:	The Riemann Integral	Black board	8
		Properties of Riemann Integral	Black board	8
		– Fundamental Theorem of Calculus.	Black board	7
		The Riemann Integral	Black board	8

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2021-22

DEPARTMENT OF MATHEMATICS
SEMESTER-III
SEC-I

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	SEC – I:
PAPER NAME	Theory of Equations
LEARNING OUTCOMES	By using the concepts learnt the students are expected to solve some of the polynomial equations..
FACULTY NAME	G RAVI &B SHIVA PRASAD

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit -I	Graphic representation of a polynomial	Maxima and minima values of polynomials	Black board	5
		Theorems relating to the real roots of equations	Black board	5
		Existence of a root in the general equation	Black board	5
		Imaginary roots – Theorem determining the number of roots of an equation –	Youtube vedios and black board	5
		Equal roots – Imaginary roots enter equations in pairs –	black board	5
		– Descartes' rule of signs for negative roots	Black board	5
Unit – II:	Relations between the roots and coefficient	Relations between the roots and coefficient	Seminor and blackboard	5
		Applications of the theorem	Blackboard with PPT presentatation	6

		Depression of an equation when a relation exists between two of its roots –		6
		The cube roots of unity Symmetric functions of the roots		4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2021-22

DEPARTMENT OF MATHEMATICS
SEMESTER-III
SEC-III

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	SEC – III
PAPER NAME	Number Theory
LEARNING OUTCOMES	Student uses the knowledge acquired solving some divisor problems
FACULTY NAME	RAVI KANDI & G RAVI

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
Unit -I	The Goldbach conjecture	Basic properties of congruences	Black board	2
		Binary and Decimal Representation of Integers –	Black board	3
		Number Theoretic Functions	Black board	3
		The Sum and Number of divisors	Youtube vedios and black board	4
		The MobiusInversion Formula	black board	4
		The Greatest integer function.	Black board	4
Unit – II:	Euler's generalization of Fermat's Theorem	Euler's generalization of Fermat's Theorem	Seminor and blackboard	4
		Euler's Phi function	Blackboard with PPT presentatation	2
		Euler's theorem		4
		Some Properties of the Euler's Phi function.	BLACK BOARD	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2021-22

DEPARTMENT OF MATHEMATICS
SEMESTER-IV

PAPER CODE	DSC – 1D
PAPER NAME	Algebra
Learning Objective	1. Present the relationships between abstract algebraic structures with familiar numbers systems such as the integers and real numbers. 2. Present concepts of and the relationships between operations satisfying various properties (e.g. commutative property). 3. Present concepts and properties of various algebraic structures. 4. Discuss the importance of algebraic properties relative to working within various number systems. 5. Develop the ability to form and evaluate conjectures
Learning Outcomes	After the completion of the course, Students will be able to 1. Understand the importance of algebraic properties with regard to working within various number systems. 2. Extend group structure to finite permutation groups (Cayley's Theorem). 3. Generate groups given specific conditions. 4. Investigate symmetry using group theory. 5. Understand the three major concrete models of Boolean algebra: the algebra of sets, the algebra of electrical circuits, and the algebra of logic.
Faculty Name	B SHIVA PRASAD
Groups	MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50 T+35 P)

Unit – I	Groups	Definition and Examples of Groups –	Black board	3
		Elementary Properties of Groups	Black board	3
		Finite Groups Subgroups Terminology and Notation	Black board	3
		Subgroup Tests – Examples of Subgroups.	Black board	3
	Cyclic Groups	Properties of Cyclic Groups – Classification of Subgroups Cyclic Groups.	Black board	2
Unit – II	Permutation Groups	Definition and Notation – Cycle Notation – Properties of Permutations – A Check Digit Scheme Based on D5.	Black board	3
		Isomorphism's; Motivation – Definition and Examples – Cayley's Theorem Properties of Isomorphism's – Auto morphisms – Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball.	Black board	10
			Black board	3
		Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball..	Black board	4
Unit – III	Normal Subgroups and Factor Groups	Normal Subgroups – Factor Groups – Applications of Factor Groups – Group Homomorphism's – Definition and Examples – Properties of Homomorphism's – The First Isomorphism Theorem.	Black board	
	Introduction to Rings	Motivation and Definition – Examples of Rings – Properties of Rings – Subrings.	Black board	

	Integral Domains	Definition and Examples – Fields – Characteristics of a Ring.	Black board	
Unit-IV	Ideals and Factor Rings:	Ideals – Factor Rings – Prime Ideals and Maximal Ideals	Black board	
	Ring Homomorphisms	Definition and Examples – Properties of Ring – Homomorphisms	Black board	

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2021-22

DEPARTMENT OF MATHEMATICS
SEMESTER-V
Paper –V

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSC – E
PAPER NAME	Linear Algebra
Learning Objective	1.Solve systems of linear equations, 2. Analyze vectors in R^n geometrically and algebraically, 3. Recognize the concepts of the terms span, linear independence, basis, and dimension, and apply these concepts to various vector spaces and subspaces, 4. Use matrix algebra and the related matrices to linear transformations, 5. Compute and use determinants, 6. Compute and use eigenvectors and eigenvalues 7. Determine and use orthogonality, and 8. Use technological tools such as computer algebra systems or graphing calculators for visualization and calculation of linear algebra concepts.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Identify and construct linear transformations of a matrix. 2. Characterize linear transformations as onto, one-to-one. 3. Solve linear systems represented as linear transforms. 4. Express linear transforms in other forms, such as as matrix equations, and vector equations. 5. Characterize a set of vectors and linear systems using the concept of linear independence
FACULTY NAME	RAVI KANDI
Groups	MPC & MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T+35P)
UNIT -I	Vector Spaces	: Vector Spaces and Subspaces	Black board	4
		– Null Spaces,	Black board	4
		Column Spaces	Black board	3
		Linear Transformations	Youtube vedios and black board	3
		Linearly Independent	black board	5
		; Bases –	Black board	10
		Coordinate Systems	Seminor and blackboard	5
		The Dimension of a Vector Space	Blackboard with PPT presentation	5
Unit – II:	Rank & Nullity	Rank – Nullity	Black board	7
		Change of Basis	Black board	8
		Eigen values and Eigenvectors	Black board	8
		The Characteristic Equation	Youtube classes & blackboard	8
UNIT-III	DIAGONALISATION	DIAGONALISATION	Black board	5
		Definition of eigen vetors ,examples ,problems.thorems on linear transformation	Black board	7
		Definition of complex eigen values,examples ,problems,theorems	Black board	8
UNIT-IV	UNIT-IV:INTRODUCTION	Applications to differential equations	Black board	7
		Orthogonality of vectors problems,properties,theorem Orthogonality of vectors problems,properties,theorem	Black board	7
	INNER PRODUCT SPACE	Orthogonal sets problems,theorems	Black board	6
		Orthogonal projections problems and theorems	Black board and seminor	7

		The gram scmidth-orthogonaisation proces	Black board and youtube	6

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE (M) NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2021-22

DEPARTMENT OF MATHEMATICS
SEMESTER-VI
Paper –VI

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSE – 1F/C
PAPER NAME	NUMERICAL ANALYSIS
Learning Objective	To get basic knowledge about Circle, Cone, Parabola, Hyperbola, Ellipse etc. 2. To understand the concepts & advance topics related to two & three dimensional geometry. 3. To study the applications of conics. 4. To study the application of Sphere, cone and cylinder. 5. To study how to trace the curve.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Understand geometrical terminology for angles, triangles, quadrilaterals and circles. 2. Measure angles using a protractor. 3. Use geometrical results to determine unknown angles. 4. Recognise line and rotational symmetries. 5. Find the areas of triangles, quadrilaterals and circles and shapes based on these.
FACULTY NAME	RAVI KANDI
Groups	MPC & MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
Unit -I	INTRODUCTION Sphere	The Sphere Through Four Given Points	Black board	6
		Equations of a Circle	Black board	7
		Intersection of a Sphere and a Line –	Black board	8
		Equation of a Tangent Plane	Youtube vedios and black board	8
		Angle of Intersection of Two	black board	6

		Spheres		
Unit – II:	Cones and Cylinders	– Condition that the General Equation of second degreeRepresents a Cone –	Black board	10
		Cone and a Plane through its Vertex –	Seminor and blackboard	12
		– Intersection of a Line with a Cone	Blackboard with PPT presentatation	8
Unit – III:	Cones and cylinders	The Right Circular Cone	Black board	10
		The Cylinder	Black board	10
		– The Right Circular Cylinder	Black board	10
Unit – IV	The Concoid	The General Equation of the Second Degree	Youtube classes & blackboard	8
		Intersection of Line with a Conicoid	Black board	8
		Plane of contact	Black board	8
		Enveloping Cone and Cylinder.	Black board	10

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2022-23

DEPARTMENT OF MATHEMATICS
SEMESTER-I

NAME OF THE PAPER	**MATHEMATICS-I**
PAPER CODE	DSC – 1A
PAPER NAME	**Differential & Integral Calculus**
Learning Objective	The course is aimed at exposing the students to some basic notions in differential calculus
Learning Outcomes	Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point. 1) Compare and contrast the ideas of continuity and differentiability. 2) To inculcate to solve algebraic equations and inequalities involving the sequence root and modulus function 3) To able to calculate limits in inderminate forms by a repeated use of L' Hospital rule. 4) To know the claim rule and use it to find derivatives of composite functions. 5) To find maxima and minima, critical points and inflection points of functions and to determine the concavity of curves. 6) To able to evaluate integrals of rational functions by partial fractions.
Faculty Name	RAVI KANDI
Academic year	2022-23 (Sem-1)
Groups	MPCs,MECs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit – I	Partial Differentiation:	Introduction Functions of two variables	Black board	3
		Neighbourhood of a point (a, b)	Black board	3
		Continuity of a Function of two variables	Black board	3
		Continuity at a point – Limit of a Function of two variables	Black board	3
		Partial Derivatives	Black board	3
		Geometrical representation of a function of two Variables – Homogeneous Functions.	Black board	3
Unit – II	Partial Differentiation:	Theorem on Total Differentials	Black board	2
		Composite Functions – Differentiation of Composite Functions	Black board	2
		Implicit Functions	Black board	2
		Equality of fxy(a b)and fyx (a b) – Taylor's theorem for a function of two variables	Black board	1
		Maxima and Minima of functions of two variables	Black board	2
		Lagrange's method of undetermined multipliers.	Black board	1
Unit – III	Curvature and Evolutes	Introduction – Definition of Curvature – Radius of Curvature	Black board	3
		Length of Arc as a Function, Derivative of arc – Radius of Curvature – Cartesian Equations – Newtonian Method – Centre of Curvature – Chord of Curvature.	Black board	10
			Black board	3

	Envelopes:	Evolutes and Involutes – Properties of the Evolutes.	Black board	4
Unit – IV	**Lengths of Plane Curves**	Introduction – Expression for the lengths of curves $y = f(x)$ – Expressions for the length of arcs $x = f(y)$; $x = f(t)$, $y = \varphi(t)$; $r = f(\theta)$.	Black board	5
	Volumes and Surfaces of Revolution	Introduction – Expression for the volume obtained by revolving about either axis – Expression for the volume obtained by revolving about any line – Area of the surface of the frustum of a cone – Expression for the surface of revolution – Pappus Theorems – Surface of revolution.	Black board	7

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2022-23

DEPARTMENT OF MATHEMATICS
SEMESTER-I

NAME OF THE PAPER	MATHEMATICS-I
PAPER CODE	DSC – 1A
PAPER NAME	**Differential & Integral Calculus**
Learning Objective	The course is aimed at exposing the students to some basic notions in differential calculus
Learning Outcomes	Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point. 1) Compare and contrast the ideas of continuity and differentiability. 2) To inculcate to solve algebraic equations and inequalities involving the sequence root and modulus function 3) To able to calculate limits in inderminate forms by a repeated use of L' Hospital rule. 4) To know the claim rule and use it to find derivatives of composite functions. 5) To find maxima and minima, critical points and inflection points of functions and to determine the concavity of curves. 6) To able to evaluate integrals of rational functions by partial fractions.
Faculty Name	B SHIVA PRASAD
Academic year	2022-23 (Sem-1)
Groups	MPC,MCCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours

Unit – I	**Partial Differentiation:**	Introduction Functions of two variables	Black board	3
		Neighbourhood of a point (a, b)	Black board	3
		Continuity of a Function of two variables	Black board	3
		Continuity at a point – Limit of a Function of two variables	Black board	3
		Partial Derivatives	Black board	3
		Geometrical representation of a function of two Variables – Homogeneous Functions.	Black board	3
Unit – II	**Partial Differentiation:**	Theorem on Total Differentials	Black board	2
		Composite Functions – Differentiation of Composite Functions	Black board	2
		Implicit Functions	Black board	2
		Equality of fxy(a b)and fyx (a b) – Taylor's theorem for a function of two variables	Black board	1
		Maxima and Minima of functions of two variables	Black board	2
		Lagrange's method of undetermined multipliers.	Black board	1
Unit – III	**Curvature and Evolutes**	Introduction – Definition of Curvature – Radius of Curvature	Black board	3
		Length of Arc as a Function, Derivative of arc – Radius of Curvature – Cartesian Equations – Newtonian Method – Centre of Curvature – Chord of Curvature.	Black board	10
			Black board	3
	Envelopes:	Evolutes and Involutes – Properties of the Evolutes.	Black board	4
	Lengths of Plane Curves	Introduction – Expression for the lengths of curves y = f (x) – Expressions for the length of arcs x = f (y); x = f (t), y = φ (t); r = f (θ).	Black board	5

Unit – IV	**Volumes and Surfaces of Revolution**	Introduction – Expression for the volume obtained by revolving about either axis – Expression for the volume obtained by revolving about any line – Area of the surface of the frustum of a cone – Expression for the surface of revolution – Pappus Theorems – Surface of revolution.	Black board	7

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2022-23

DEPARTMENT OF MATHEMATICS
SEMESTER-II

NAME OF THE PAPER	MATHEMATICS-II
PAPER CODE	DSC – 1B
PAPER NAME	**Differential Equations**
Learning Objective	1. Evaluate first order differential equations including separable, homogeneous, exact, and linear. 2. Show existence and uniqueness of solutions. 3. Solve second order and higher order linear differential equations. 4. Create and analyse mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. 5. Solve differential equations using variation of parameters 6. Solve linear systems of ordinary differential equations
Learning Outcomes	After the completion of the course, Students will be able to 1. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. 2. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. 3. Student will be introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. 4. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. 5. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
Faculty Name	RAVI
GROUPS	MPCs, MECs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit – I	(Differential Equations of first order and first degree)	Introduction Differential Equations of first order and first degree	Black board	3
		Equations in which Variables are Separable	Black board	3
		Homogeneous Differential Equations	Black board	3
		Differential Equations Reducible to Homogeneous Form	Black board	3
		Linear Differential Equations	Black board	3
		Differential Equations Reducible to Linear Form	Black board	3
		Exact differential equations	Black board	3
		Integrating Factors	Black board	1
		Change in variables	Black board	2
		Total Differential Equations	Black board	4
		Simultaneous Total Differential Equations	Black board	1
		Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Black board	2
		Equations Solvable for p	Black board	2
		– Equations Solvable for y	Black board	2
		Equations Solvable for x	Black board	2

Unit – I	**Differential Equations first order but not of first degree**	Equations that do not contain x (or y)	Black board	1
		Equations Homogeneous in x and y	Black board	2
		Equations of the First Degree in x and y	Black board	1
		Clairaut's equation.	Black board	1
	Applications of First Order Differential Equations:	Growth and Decay	Black board	2
		Dynamics of Tumour Growth	Black board	2
		Radioactivity and Carbon Dating	Black board	2
		Compound Interest	Black board	1
		Orthogonal Trajectories	Black board	2
Unit – III	**Higher order Linear Differential Equations:**	Solution of homogeneous linear differential equations with constant coefficients	Black board	3
		Solution of non-homogeneous differential equations P(D) y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ax , bsin ax/bcos ax, bxk , Ve ax	Black board	10
		Method of undetermined coefficients.	Black board	2
	Higher order Linear Differential Equations	Method of variation of parameters	Black board	3
		Linear differential equations with non-constant coefficients	Black board	2
		The Cauchy – Euler Equation –	Black board	2

Unit – IV		Legendre's Linear Equations	Black board	3
		Miscellaneous Differential Equations.	Black board	2
	Partial Differential Equations	Formation and solution – Equations easily integrable	Black board	4
		Linear equations of first order.	Black board	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2022-23

DEPARTMENT OF MATHEMATICS
SEMESTER-II

NAME OF THE PAPER	MATHEMATICS-II
PAPER CODE	DSC – 1B
PAPER NAME	**Differential Equations**
Learning Objective	1. Evaluate first order differential equations including separable, homogeneous, exact, and linear. 2. Show existence and uniqueness of solutions. 3. Solve second order and higher order linear differential equations. 4. Create and analyse mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. 5. Solve differential equations using variation of parameters 6. Solve linear systems of ordinary differential equations
Learning Outcomes	After the completion of the course, Students will be able to 1. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. 2. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. 3. Student will be introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. 4. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. 5. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
Faculty Name	B SHIVA PRASAD
GROUPS	MPC, MCCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit – I	(Differential Equations of first order and first degree)	Introduction Differential Equations of first order and first degree	Black board	4
		Equations in which Variables are Separable	Black board	4
		Homogeneous Differential Equations	Black board	5
		Differential Equations Reducible to Homogeneous Form	Black board	4
		Linear Differential Equations	Black board	3
		Differential Equations Reducible to Linear Form	Black board	3
		Exact differential equations	Black board	4
		Integrating Factors	Black board	1
		Change in variables	Black board	2
		Total Differential Equations	Black board	4
		Simultaneous Total Differential Equations	Black board	1
		Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Black board	2
		Equations Solvable for p	Black board	2
		– Equations Solvable for y	Black board	2
		Equations Solvable for x	Black board	2

Unit – I	**Differential Equations first order but not of first degree**	Equations that do not contain x (or y)	Black board	1
		Equations Homogeneous in x and y	Black board	2
		Equations of the First Degree in x and y	Black board	1
		Clairaut's equation.	Black board	1
	Applications of First Order Differential Equations:	Growth and Decay	Black board	2
		Dynamics of Tumour Growth	Black board	2
		Radioactivity and Carbon Dating	Black board	2
		Compound Interest	Black board	1
		Orthogonal Trajectories	Black board	2
Unit – III	**Higher order Linear Differential Equations:**	Solution of homogeneous linear differential equations with constant coefficients	Black board	3
		Solution of non-homogeneous differential equations P(D) y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ax , bsin ax/bcos ax, bxk , Ve ax	Black board	10
		Method of undetermined coefficients.	Black board	2
	Higher order Linear Differential Equations	Method of variation of parameters	Black board	3
		Linear differential equations with non-constant coefficients	Black board	2
		The Cauchy – Euler Equation –	Black board	2

Unit – IV		Legendre's Linear Equations	Black board	3
		Miscellaneous Differential Equations.	Black board	2
	Partial Differential Equations	Formation and solution – Equations easily integrable	Black board	4
		Linear equations of first order.	Black board	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2022-23

DEPARTMENT OF MATHEMATICS
SEMESTER-III

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSC – 1C
PAPER NAME	REAL ANALYSIS-III
Learning Objective	The student will: 1. Define the real numbers, least upper bounds, and the triangle inequality. 2. Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences. 3. Calculate the limit superior, limit inferior, and the limit of a sequence. 4. Recognize alternating, convergent, conditionally and absolutely convergent series. 5. Determine if subsets of a metric space are open, closed, connected, bounded, totally bounded and/or compact. 6. Determine if a function on a metric space is discontinuous, continuous, or uniformly continuous.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Describe fundamental properties of the real numbers that lead to the formal development of real analysis. 2. Comprehend rigorous arguments developing the theory underpinning real analysis. 3. Demonstrate an understanding of limits and how they are used in sequences, series, differentiation and integration. 4. Construct rigorous mathematical proofs of basic results in real analysis. 5. Appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.
Faculty Name	B SHIVA PRASAD
Groups	MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
UNIT -I	INTRODUCTION OF SEQUENCES	Sequences: Limits of Sequences	Black board	4
		A Discussion about Proofs – Limit Theorems for Sequences	Black board	4
		Monotone Sequences and Cauchy Sequences	Black board	3
		Subsequences	Youtube vedios and black board	3
		Lim sup's and Lim inf's	black board	5
		– Series	Black board	10
		Alternating Series and Integral Tests.	Seminor and blackboard	5
Unit – II	INTRODUCTION OF CONTINUITY	Continuity: Continuous Function	Blackboard with PPT presentation	5
		Properties of Continuous Functions	Black board	7
		Uniform Continuity –	Black board	8
		Limits of Functions	Black board	8
Unit – III	Differentiation	Basic Properties of the Derivatives	Black board	
		The Mean Value Theorem	Black board	
		L'Hospital Rule –	Black board	
		–Taylor's Theorem	Black board	
Unit – IV	INTRODUCTION Integration:	The Riemann Integral	Black board	8
		Properties of Riemann Integral	Black board	8
		Fundamental Theorem of Calculus.	Black board	7
		The Riemann Integral	Black board	8

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2022-23

DEPARTMENT OF MATHEMATICS
SEMESTER-III
SEC-I

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	SEC – I:
PAPER NAME	Theory of Equations
LEARNING OUTCOMES	By using the concepts learnt the students are expected to solve some of the polynomial equations..
FACULTY NAME	B SHIVA PRASAD

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit -I	Graphic representation of a polynomial	Maxima and minima values of polynomials	Black board	5
		Theorems relating to the real roots of equations	Black board	5
		– Existence of a root in the general equation	Black board	5
		Imaginary roots – Theorem determining the number of roots of an equation –	Youtube vedios and black board	5
		Equal roots – Imaginary roots enter equations in pairs –	black board	5
		– Descartes' rule of signs for negative roots	Black board	5
Unit – II:	Relations between the roots and coefficient	Relations between the roots and coefficient	Seminor and blackboard	5
		Applications of the theorem	Blackboard with PPT presentatation	6

		Depression of an equation when a relation exists between two of its roots –		6
		The cube roots of unity Symmetric functions of the roots		4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2022-23

DEPARTMENT OF MATHEMATICS
SEMESTER-IV
SEC-III

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	SEC – III
PAPER NAME	Number Theory
LEARNING OUTCOMES	Student uses the knowledge acquired solving some divisor problems
FACULTY NAME	RAVI KANDI AND B SHIVA PRASAD

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit -I	The Gold Bach conjecture	Basic properties of congruence's	Black board	5
		Binary and Decimal Representation of integers –	Black board	5
		Number Theoretic Functions	Black board	5
		The Sum and Number of divisors	Youtube vedios and black board	5
		The MobiusInversion Formula	black board	5
		The Greatest integer function.	Black board	5
Unit – II:	Euler's generalization of Fermat's Theorem	Euler's generalization of Fermat's Theorem	Seminor and blackboard	5
		Euler's Phi function	Blackboard with PPT presentatation	6
		Euler's theorem		6
		SomeProperties of the	BLACK BOARD	6

		Euler's Phi function.		

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2022-23

DEPARTMENT OF MATHEMATICS
SEMESTER-IV

PAPER CODE	DSC – 1D
PAPER NAME	Algebra
Learning Objective	1. Present the relationships between abstract algebraic structures with familiar numbers systems such as the integers and real numbers. 2. Present concepts of and the relationships between operations satisfying various properties (e.g. commutative property). 3. Present concepts and properties of various algebraic structures. 4. Discuss the importance of algebraic properties relative to working within various number systems. 5. Develop the ability to form and evaluate conjectures
Learning Outcomes	After the completion of the course, Students will be able to 1. Understand the importance of algebraic properties with regard to working within various number systems. 2. Extend group structure to finite permutation groups (Cayley's Theorem). 3. Generate groups given specific conditions. 4. Investigate symmetry using group theory. 5. Understand the three major concrete models of Boolean algebra: the algebra of sets, the algebra of electrical circuits, and the algebra of logic.
Faculty Name	B SHIVA PRASAD
Groups	MPC & MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit – I	Groups	Definition and Examples of Groups –	Black board	3
		Elementary Properties of Groups	Black board	3
		Finite Groups Subgroups Terminology and Notation	Black board	3
		Subgroup Tests – Examples of Subgroups.	Black board	3
	Cyclic Groups	Properties of Cyclic Groups – Classification of Subgroups Cyclic Groups.	Black board	2
Unit – II	Permutation Groups	Definition and Notation – Cycle Notation – Properties of Permutations – A Check Digit Scheme Based on D5.	Black board	3
		Isomorphism's; Motivation – Definition and Examples – Cayley's Theorem Properties of Isomorphism's – Auto morphisms – Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball.	Black board	10
			Black board	3
		Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball..	Black board	4

Unit – III	Normal Subgroups and Factor Groups	Normal Subgroups – Factor Groups – Applications of Factor Groups – Group Homomorphism's – Definition and Examples – Properties of Homomorphism's – The First Isomorphism Theorem.	Black board	
	Introduction to Rings	Motivation and Definition – Examples of Rings – Properties of Rings – Subrings.	Black board	
	Integral Domains	Definition and Examples – Fields – Characteristics of a Ring.	Black board	
Unit-IV	Ideals and Factor Rings:	Ideals – Factor Rings – Prime Ideals and Maximal Ideals	Black board	
	Ring Homomorphisms	Definition and Examples – Properties of Ring – Homomorphisms	Black board	

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2022-23

DEPARTMENT OF MATHEMATICS
SEMESTER-V
Paper –V

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSC – E
PAPER NAME	Linear Algebra
Learning Objective	1.Solve systems of linear equations, 2. Analyze vectors in R^n geometrically and algebraically, 3. Recognize the concepts of the terms span, linear independence, basis, and dimension, and apply these concepts to various vector spaces and subspaces, 4. Use matrix algebra and the related matrices to linear transformations, 5. Compute and use determinants, 6. Compute and use eigenvectors and eigenvalues 7. Determine and use orthogonality, and 8. Use technological tools such as computer algebra systems or graphing calculators for visualization and calculation of linear algebra concepts.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Identify and construct linear transformations of a matrix. 2. Characterize linear transformations as onto, one-to-one. 3. Solve linear systems represented as linear transforms. 4. Express linear transforms in other forms, such as as matrix equations, and vector equations. 5. Characterize a set of vectors and linear systems using the concept of linear independence
FACULTY NAME	RAVI KANDI
Groups	MPC & MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
UNIT -I	Vector Spaces	: Vector Spaces and Subspaces	Black board	4
		– Null Spaces,	Black board	4
		Column Spaces	Black board	3
		Linear Transformations	Youtube vedios and black board	3
		Linearly Independent	black board	5
		; Bases –	Black board	10
		Coordinate Systems	Seminor and blackboard	5
		The Dimension of a Vector Space	Blackboard with PPT presentation	5
Unit – II:	Rank & Nullity	Rank – Nullity	Black board	7
		Change of Basis	Black board	8
		Eigen values and Eigenvectors	Black board	8
		The Characteristic Equation	Youtube classes & blackboard	8
UNIT-III	DIAGONALISATION	DIAGONALISATION	Black board	5
		Definition of eigen vetors ,examples ,problems.thorems on linear transformation	Black board	7
		Definition of complex eigen values,examples ,problems,theorems	Black board	8
UNIT-IV	**UNIT-IV: INTRODUCTION**	Applications to differential equations	Black board	7
		Orthogonality of vectors problems,properties,theorem Orthogonality of vectors problems,properties,theorem	Black board	7
	INNER PRODUCT SPACE	Orthogonal sets problems,theorems	Black board	6
		Orthogonal projections problems and theorems	Black board and seminor	7

		The gram scmidth-orthogonaisation proces	Black board and youtube	6

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE MAHABUB NAGAR
LESSON PLAN FOR ACADAMIC YEAR 2022-23

DEPARTMENT OF MATHEMATICS
SEMESTER-VI
Paper –VI

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSE – 1F/C
PAPER NAME	RAVI KANDI
Learning Objective	To get basic knowledge about Circle, Cone, Parabola, Hyperbola, Ellipse etc. 2. To understand the concepts & advance topics related to two & three dimensional geometry. 3. To study the applications of conics. 4. To study the application of Sphere, cone and cylinder. 5. To study how to trace the curve.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Understand geometrical terminology for angles, triangles, quadrilaterals and circles. 2. Measure angles using a protractor. 3. Use geometrical results to determine unknown angles. 4. Recognise line and rotational symmetries. 5. Find the areas of triangles, quadrilaterals and circles and shapes based on these.
FACULTY NAME	RAVI KANDI
Groups	MPC &MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit -I	INTRODUCTION Sphere	The Sphere Through Four Given Points	Black board	6
		Equations of a Circle	Black board	7
		Intersection of a Sphere and a Line –	Black board	8
		Equation of a Tangent Plane	Youtube vedios and black board	8

		Angle of Intersection of Two Spheres	black board	6
Unit – II:	Cones and Cylinders	– Condition that the General Equation of second degreeRepresents a Cone –	Black board	10
		Cone and a Plane through its Vertex –	Seminor and blackboard	12
		– Intersection of a Line with a Cone	Blackboard with PPT presentatation	8
Unit – III:	Cones and cylinders	The Right Circular Cone	Black board	10
		The Cylinder	Black board	10
		– The Right Circular Cylinder	Black board	10
Unit – IV	The Concoid	The General Equation of the Second Degree	Youtube classes & blackboard	8
		Intersection of Line with a Conicoid	Black board	8
		Plane of contact	Black board	8
		Enveloping Cone and Cylinder.	Black board	10

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE NAGARKURNOOL
LESSON PLAN FOR ACADEMIC YEAR 2023-24

DEPARTMENT OF MATHEMATICS
SEMESTER-I

NAME OF THE PAPER	MATHEMATICS-I
PAPER CODE	DSC – 1A
PAPER NAME	**Differential & Integral Calculus**
Learning Objective	The course is aimed at exposing the students to some basic notions in differential calculus
Learning Outcomes	Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point. 1) Compare and contrast the ideas of continuity and differentiability. 2) To inculcate to solve algebraic equations and inequalities involving the sequence root and modulus function 3) To able to calculate limits in indeterminate forms by a repeated use of L' Hospital rule. 4) To know the claim rule and use it to find derivatives of composite functions. 5) To find maxima and minima, critical points and inflection points of functions and to determine the concavity of curves. 6) To able to evaluate integrals of rational functions by partial fractions.
Faculty Name	RAVI KANDI
Academic year	2023-24 (Sem-1)
Groups	MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours

Unit – I	Partial Differentiation:	Introduction Functions of two variables	Black board	3
		Neighbourhood of a point (a, b)	Black board	3
		Continuity of a Function of two variables	Black board	3
		Continuity at a point – Limit of a Function of two variables	Black board	3
		Partial Derivatives	Black board	3
		Geometrical representation of a function of two Variables – Homogeneous Functions.	Black board	3
Unit – II	Partial Differentiation:	Theorem on Total Differentials	Black board	2
		Composite Functions – Differentiation of Composite Functions	Black board	2
		Implicit Functions	Black board	2
		Equality of fxy(a b)and fyx (a b) – Taylor's theorem for a function of two variables	Black board	1
		Maxima and Minima of functions of two variables	Black board	2
		Lagrange's method of undetermined multipliers.	Black board	1
Unit – III	Curvature and Evolutes	Introduction – Definition of Curvature – Radius of Curvature	Black board	3
		Length of Arc as a Function, Derivative of arc – Radius of Curvature – Cartesian Equations – Newtonian Method – Centre of Curvature – Chord of Curvature.	Black board	10
			Black board	3
	Envelopes:	Evolutes and Involutes – Properties of the Evolutes.	Black board	4
	Lengths of Plane Curves	Introduction – Expression for the lengths of curves y = f (x) – Expressions for the length of arcs x = f (y); x = f (t), y = φ (t); r = f (θ).	Black board	5

Unit – IV	**Volumes and Surfaces of Revolution**	Introduction – Expression for the volume obtained by revolving about either axis – Expression for the volume obtained by revolving about any line – Area of the surface of the frustum of a cone – Expression for the surface of revolution – Pappus Theorems – Surface of revolution.	Black board	7

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE NAGARKURNOOL
LESSON PLAN FOR ACADEMIC YEAR 2023-24

DEPARTMENT OF MATHEMATICS
SEMESTER-I

NAME OF THE PAPER	MATHEMATICS-I
PAPER CODE	DSC – 1A
PAPER NAME	**Differential & Integral Calculus**
Learning Objective	The course is aimed at exposing the students to some basic notions in differential calculus
Learning Outcomes	Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point. 1) Compare and contrast the ideas of continuity and differentiability. 2) To inculcate to solve algebraic equations and inequalities involving the sequence root and modulus function 3) To able to calculate limits in inderminate forms by a repeated use of L' Hospital rule. 4) To know the claim rule and use it to find derivatives of composite functions. 5) To find maxima and minima, critical points and inflection points of functions and to determine the concavity of curves. 6) To able to evaluate integrals of rational functions by partial fractions.
Faculty Name	B SHIVA PRASAD
Academic year	2023-24 (Sem-1)
Groups	MPC

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours

Unit – I	Partial Differentiation:	Introduction Functions of two variables	Black board	3
		Neighbourhood of a point (a, b)	Black board	3
		Continuity of a Function of two variables	Black board	3
		Continuity at a point – Limit of a Function of two variables	Black board	3
		Partial Derivatives	Black board	3
		Geometrical representation of a function of two Variables – Homogeneous Functions.	Black board	3
Unit – II	Partial Differentiation:	Theorem on Total Differentials	Black board	2
		Composite Functions – Differentiation of Composite Functions	Black board	2
		Implicit Functions	Black board	2
		Equality of fxy(a b)and fyx (a b) – Taylor's theorem for a function of two variables	Black board	1
		Maxima and Minima of functions of two variables	Black board	2
		Lagrange's method of undetermined multipliers.	Black board	1
Unit – III	Curvature and Evolutes	Introduction – Definition of Curvature – Radius of Curvature	Black board	3
		Length of Arc as a Function, Derivative of arc – Radius of Curvature – Cartesian Equations – Newtonian Method – Centre of Curvature – Chord of Curvature.	Black board	10
			Black board	3
	Envelopes:	Evolutes and Involutes – Properties of the Evolutes.	Black board	4
	Lengths of Plane Curves	Introduction – Expression for the lengths of curves y = f (x) – Expressions for the length of arcs x = f (y); x = f (t), y = φ (t); r = f (θ).	Black board	5

Unit – IV	Volumes and Surfaces of Revolution	Introduction – Expression for the volume obtained by revolving about either axis – Expression for the volume obtained by revolving about any line – Area of the surface of the frustum of a cone – Expression for the surface of revolution – Pappus Theorems – Surface of revolution.	Black board	7

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE NAGARKURNOOL
LESSON PLAN FOR ACADEMIC YEAR 2023-24

DEPARTMENT OF MATHEMATICS
SEMESTER-II

NAME OF THE PAPER	MATHEMATICS-II
PAPER CODE	DSC – 1B
PAPER NAME	**Differential Equations**
Learning Objective	1. Evaluate first order differential equations including separable, homogeneous, exact, and linear. 2. Show existence and uniqueness of solutions. 3. Solve second order and higher order linear differential equations. 4. Create and analyse mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. 5. Solve differential equations using variation of parameters 6. Solve linear systems of ordinary differential equations
Learning Outcomes	After the completion of the course, Students will be able to 1. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. 2. Student will be able to find the complete solution of a non homogeneous differential equation as a linear combination of the complementary function and a particular solution. 3. Student will be introduced to the complete solution of a non homogeneous differential equation with constant coefficients by the method of undetermined coefficients. 4. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. 5. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
Faculty Name	RAVI KANDI
GROUPS	MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit – I	(Differential Equations of first order and first degree)	Introduction Differential Equations of first order and first degree	Black board	3
		Equations in which Variables are Separable	Black board	3
		Homogeneous Differential Equations	Black board	3
		Differential Equations Reducible to Homogeneous Form	Black board	3
		Linear Differential Equations	Black board	3
		Differential Equations Reducible to Linear Form	Black board	3
		Exact differential equations	Black board	3
		Integrating Factors	Black board	1
		Change in variables	Black board	2
		Total Differential Equations	Black board	4
		Simultaneous Total Differential Equations	Black board	1
		Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Black board	2
		Equations Solvable for p	Black board	2
		– Equations Solvable for y	Black board	2
		Equations Solvable for x	Black board	2

Unit – I	**Differential Equations first order but not of first degree**	Equations that do not contain x (or y)	Black board	1
		Equations Homogeneous in x and y	Black board	2
		Equations of the First Degree in x and y	Black board	1
		Clairaut's equation.	Black board	1
	Applications of First Order Differential Equations:	Growth and Decay	Black board	2
		Dynamics of Tumour Growth	Black board	2
		Radioactivity and Carbon Dating	Black board	2
		Compound Interest	Black board	1
		Orthogonal Trajectories	Black board	2
Unit – III	**Higher order Linear Differential Equations:**	Solution of homogeneous linear differential equations with constant coefficients	Black board	3
		Solution of non-homogeneous differential equations P(D) y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ax , bsin ax/bcos ax, bxk , Ve ax	Black board	10
		Method of undetermined coefficients.	Black board	2
	Higher order Linear Differential Equations	Method of variation of parameters	Black board	3
		Linear differential equations with non-constant coefficients	Black board	2
		The Cauchy – Euler Equation –	Black board	2

Unit – IV		Legendre's Linear Equations	Black board	3
		Miscellaneous Differential Equations.	Black board	2
	Partial Differential Equations	Formation and solution – Equations easily integrable	Black board	4
		Linear equations of first order.	Black board	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE NAGARKURNOOL
LESSON PLAN FOR ACADEMIC YEAR 2023-24

DEPARTMENT OF MATHEMATICS
SEMESTER-II

NAME OF THE PAPER	**MATHEMATICS-II**
PAPER CODE	DSC – 1B
PAPER NAME	**Differential Equations**
Learning Objective	1. Evaluate first order differential equations including separable, homogeneous, exact, and linear. 2. Show existence and uniqueness of solutions. 3. Solve second order and higher order linear differential equations. 4. Create and analyse mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. 5. Solve differential equations using variation of parameters 6. Solve linear systems of ordinary differential equations
Learning Outcomes	After the completion of the course, Students will be able to 1. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. 2. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. 3. Student will be introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. 4. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. 5. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
Faculty Name	B SHIVA PRASAD
GROUPS	MPC

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit – I	(Differential Equations of first order and first degree)	Introduction Differential Equations of first order and first degree	Black board	4
		Equations in which Variables are Separable	Black board	4
		Homogeneous Differential Equations	Black board	5
		Differential Equations Reducible to Homogeneous Form	Black board	4
		Linear Differential Equations	Black board	3
		Differential Equations Reducible to Linear Form	Black board	3
		Exact differential equations	Black board	4
		Integrating Factors	Black board	1
		Change in variables	Black board	2
		Total Differential Equations	Black board	4
		Simultaneous Total Differential Equations	Black board	1
		Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	Black board	2
		Equations Solvable for p	Black board	2
		– Equations Solvable for y	Black board	2
		Equations Solvable for x	Black board	2

Unit – I	Differential Equations first order but not of first degree	Equations that do not contain x (or y)	Black board	1
		Equations Homogeneous in x and y	Black board	2
		Equations of the First Degree in x and y	Black board	1
		Clairaut's equation.	Black board	1
	Applications of First Order Differential Equations:	Growth and Decay	Black board	2
		Dynamics of Tumour Growth	Black board	2
		Radioactivity and Carbon Dating	Black board	2
		Compound Interest	Black board	1
		Orthogonal Trajectories	Black board	2
Unit – III	Higher order Linear Differential Equations:	Solution of homogeneous linear differential equations with constant coefficients	Black board	3
		Solution of non-homogeneous differential equations P(D) y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ax , bsin ax/bcos ax, bxk , Ve ax	Black board	10
		Method of undetermined coefficients.	Black board	2
	Higher order Linear Differential Equations	Method of variation of parameters	Black board	3
		Linear differential equations with non-constant coefficients	Black board	2
		The Cauchy – Euler Equation –	Black board	2

Unit – IV		Legendre's Linear Equations	Black board	3
		Miscellaneous Differential Equations.	Black board	2
	Partial Differential Equations	Formation and solution – Equations easily integrable	Black board	4
		Linear equations of first order.	Black board	4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE NAGARKURNOOL
LESSON PLAN FOR ACADEMIC YEAR 2023-24

DEPARTMENT OF MATHEMATICS
SEMESTER-III

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSC – 1C
PAPER NAME	REAL ANALYSIS-III
Learning Objective	The student will: 1. Define the real numbers, least upper bounds, and the triangle inequality. 2. Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences. 3. Calculate the limit superior, limit inferior, and the limit of a sequence. 4. Recognize alternating, convergent, conditionally and absolutely convergent series. 5. Determine if subsets of a metric space are open, closed, connected, bounded, totally bounded and/or compact. 6. Determine if a function on a metric space is discontinuous, continuous, or uniformly continuous.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Describe fundamental properties of the real numbers that lead to the formal development of real analysis. 2. Comprehend rigorous arguments developing the theory underpinning real analysis. 3. Demonstrate an understanding of limits and how they are used in sequences, series, differentiation and integration. 4. Construct rigorous mathematical proofs of basic results in real analysis. 5. Appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.
Faculty Name	RAVI KANDI
Groups	**MPC & MPCs**

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours(50T +35 P)
UNIT -I	INTRODUCTION OF SEQUENCES	Sequences: Limits of Sequences	Black board	4
		A Discussion about Proofs – Limit Theorems for Sequences	Black board	4
		Monotone Sequences and Cauchy Sequences	Black board	3
		Subsequences	Youtube vedios and black board	3
		Lim sup's and Lim inf's	black board	5
		– Series	Black board	10
		Alternating Series and Integral Tests.	Seminor and blackboard	5
Unit – II	INTRODUCTION OF CONTINUITY	Continuity: Continuous Function	Blackboard with PPT presentation	5
		Properties of Continuous Functions	Black board	7
		Uniform Continuity –	Black board	8
Unit – III	Differentiation	Limits of Functions	Black board	8
		Basic Properties of the Derivatives	Black board	
		The Mean Value Theorem	Black board	
		L'Hospital Rule –	Black board	
		–Taylor's Theorem	Black board	
Unit – IV	INTRODUCTIONI ntegration:	The Riemann Integral	Black board	8
		Properties of Riemann Integral	Black board	8
		Fundamental Theorem of Calculus,	Black board	7
		The Riemann Integral	Black board	8

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE NAGARKURNOOL

LESSON PLAN FOR ACADEMIC YEAR 2023-24

DEPARTMENT OF MATHEMATICS

SEMESTER-III

SEC-I

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	SEC – I:
PAPER NAME	Theory of Equations
LEARNING OUTCOMES	By using the concepts learnt the students are expected to solve some of the polynomial equations..
FACULTY NAME	RAVI KANDI

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit -I	Graphic representation of a polynomial	Maxima and minima values of polynomials	Black board	5
		Theorems relating to the real roots of equations	Black board	5
		– Existence of a root in the general equation	Black board	5
		Imaginary roots – Theorem determining the number of roots of an equation –	Youtube vedios and black - board	5
		Equal roots – Imaginary roots enter equations in pairs –	black board	5
		– Descartes' rule of signs for negative roots	Black board	5
Unit – II:	Relations between the roots and coefficient	Relations between the roots and coefficient	Seminor and blackboard	5
		Applications of the theorem	Blackboard with PPT presentatation	6
		Depression of an equation when a relation exists between two of its roots –		6

		The cube roots of unity Symmetric functions of the roots		4

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE NAGARKURNOOL
LESSON PLAN FOR ACADEMIC YEAR 2023-24

DEPARTMENT OF MATHEMATICS
SEMESTER-IV
SEC-III

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	SEC – III
PAPER NAME	Number Theory
LEARNING OUTCOMES	Student uses the knowledge acquired solving some divisor problems
FACULTY NAME	RAVI KANDI

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit -I	The Gold Bach conjecture	Basic properties of congruence's	Black board	5
		Binary and Decimal Representation of integers –	Black board	5
		Number Theoretic Functions	Black board	5
		The Sum and Number of divisors	Youtube vedios and black board	5
		The MobiusInversion Formula	black board	5
		The Greatest integer function.	Black board	5
Unit – II:	Euler's generalization of Fermat's Theorem	Euler's generalization of Fermat's Theorem	Seminor and blackboard	5
		Euler's Phi function	Blackboard with PPT presentatation	6
		Euler's theorem		6
		SomeProperties of the Euler's Phi function.	BLACK BOARD	6

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE NAGARKURNOOL
LESSON PLAN FOR ACADEMIC YEAR 2023-24

DEPARTMENT OF MATHEMATICS
SEMESTER-IV

PAPER CODE	DSC – 1D
PAPER NAME	Algebra
Learning Objective	1. Present the relationships between abstract algebraic structures with familiar numbers systems such as the integers and real numbers. 2. Present concepts of and the relationships between operations satisfying various properties (e.g. commutative property). 3. Present concepts and properties of various algebraic structures. 4. Discuss the importance of algebraic properties relative to working within various number systems. 5. Develop the ability to form and evaluate conjectures
Learning Outcomes	After the completion of the course, Students will be able to 1. Understand the importance of algebraic properties with regard to working within various number systems. 2. Extend group structure to finite permutation groups (Cayley's Theorem). 3. Generate groups given specific conditions. 4. Investigate symmetry using group theory. 5. Understand the three major concrete models of Boolean algebra: the algebra of sets, the algebra of electrical circuits, and the algebra of logic.
Faculty Name	RAVI KANDI
Groups	MPCs

UNIT NO.	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours

Unit – I	Groups	Definition and Examples of Groups –	Black board	3
		Elementary Properties of Groups	Black board	3
		Finite Groups Subgroups Terminology and Notation	Black board	3
		Subgroup Tests – Examples of Subgroups.	Black board	3
	Cyclic Groups	Properties of Cyclic Groups – Classification of Subgroups Cyclic Groups.	Black board	2
Unit – II	Permutation Groups	Definition and Notation – Cycle Notation – Properties of Permutations – A Check Digit Scheme Based on D5.	Black board	3
		Isomorphism's; Motivation – Definition and Examples – Cayley's Theorem Properties of Isomorphism's – Auto morphisms – Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball.	Black board	10
		Cosets and Lagrange's Theorem Properties of Cosets – Lagrange's Theorem and Consequences – An Application of Cosets to Permutation Groups – The Rotation Group of a Cube and a Soccer Ball..	Black board	3
Unit – III	Normal Subgroups and Factor Groups	Normal Subgroups – Factor Groups – Applications of Factor Groups – Group Homomorphism's – Definition and Examples – Properties of Homomorphism's – The First Isomorphism Theorem.	Black board	4
	Introduction to Rings	Motivation and Definition – Examples of Rings – Properties of Rings – Subrings.	Black board	

	Integral Domains	Definition and Examples – Fields – Characteristics of a Ring.	Black board	
Unit-IV	Ideals and Factor Rings:	Ideals – Factor Rings – Prime Ideals and Maximal Ideals	Black board	
	Ring Homomorphisms	Definition and Examples – Properties of Ring – Homomorphisms	Black board	

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE NAGARKURNOOL

LESSON PLAN FOR ACADEMIC YEAR 2023-24

DEPARTMENT OF MATHEMATICS

SEMESTER-V

Paper –V

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSC – E
PAPER NAME	Linear Algebra
Learning Objective	1.Solve systems of linear equations, 2. Analyze vectors in R^n geometrically and algebraically, 3. Recognize the concepts of the terms span, linear independence, basis, and dimension, and apply these concepts to various vector spaces and subspaces, 4. Use matrix algebra and the related matrices to linear transformations, 5. Compute and use determinants, 6. Compute and use eigenvectors and eigen values 7. Determine and use orthogonality, and 8. Use technological tools such as computer algebra systems or graphing calculators for visualization and calculation of linear algebra concepts.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Identify and construct linear transformations of a matrix. 2. Characterize linear transformations as onto, one-to-one. 3. Solve linear systems represented as linear transforms. 4. Express linear transforms in other forms, such as as matrix equations, and vector equations. 5. Characterize a set of vectors and linear systems using the concept of linear Independence
FACULTY NAME	B.SHIVAPRASAD
Groups	MPC & MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
UNIT -I	Vector Spaces	: Vector Spaces and Subspaces	Black board	4
		– Null Spaces,	Black board	4
		Column Spaces	Black board	3
		Linear Transformations	Youtube vedios and black board	3
		Linearly Independent	black board	5
		; Bases –	Black board	10
		Coordinate Systems	Seminor and blackboard	5
		The Dimension of a Vector Space	Blackboard with PPT presentation	5
Unit – II:	Rank & Nullity	Rank – Nullity	Black board	7
		Change of Basis	Black board	8
		Eigen values and Eigenvectors	Black board	8
		The Characteristic Equation	Youtube classes & blackboard	8
UNIT-III	DIAGONALISATION	DIAGONALISATION	Black board	5
		Definition of eigen vetors ,examples ,problems.thorems on linear transformation	Black board	7
		Definition of complex eigen values,examples ,problems,theorems	Black board	8
UNIT-IV	**UNIT-IV:INTRODUCTION**	Applications to differential equations	Black board	7
		Orthogonality of vectors problems,properties,theorem Orthogonality of vectors problems,properties,theorem	Black board	7
	INNER PRODUCT SPACE	Orthogonal sets problems,theorems	Black board	6
		Orthogonal projections problems and theorems	Black board and seminor	7

		The gram scmidth-orthogonaisation proces	Black board and youtube	6

TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE NAGARKURNOOL
LESSON PLAN FOR ACADAMIC YEAR 2023-24

DEPARTMENT OF MATHEMATICS
SEMESTER-VI
Paper –VI

NAME OF THE PAPER	B.Sc (MATHEMATICS)
PAPER CODE	DSE – 1F/C
PAPER NAME	SOLID GEOMETRY
Learning Objective	To get basic knowledge about Circle, Cone, Parabola, Hyperbola, Ellipse etc. 2. To understand the concepts & advance topics related to two & three dimensional geometry. 3. To study the applications of conics. 4. To study the application of Sphere, cone and cylinder. 5. To study how to trace the curve.
LEARNING OUTCOMES	After the completion of the course, Students will be able to 1. Understand geometrical terminology for angles, triangles, quadrilaterals and circles. 2. Measure angles using a protractor. 3. Use geometrical results to determine unknown angles. 4. Recognise line and rotational symmetries. 5. Find the areas of triangles, quadrilaterals and circles and shapes based on these.
FACULTY NAME	B SHIVA PRASAD
Groups	MPC &MPCs

UNIT NO	UNIT NAME & LESSON NAME	SUB TOPIC	Teaching pedagogy, teaching Aids curricular ,Extra Curricular Activities, etc.	NO of Hours
Unit -I	INTRODUCTION Sphere	The Sphere Through Four Given Points	Black board	6
		Equations of a Circle	Black board	7
		Intersection of a Sphere and a Line –	Black board	8
		Equation of a Tangent Plane	Youtube vedios and black board	8
		Angle of Intersection of Two	black board	6

		Spheres		
Unit – II:	Cones and Cylinders	– Condition that the General Equation of second degreeRepresents a Cone –	Black board	10
		Cone and a Plane through its Vertex –	Seminor and blackboard	12
		– Intersection of a Line with a Cone	Blackboard with PPT presentatation	8
Unit – III:	Cones and cylinders	The Right Circular Cone	Black board	10
		The Cylinder	Black board	10
		– The Right Circular Cylinder	Black board	10
Unit – IV	The Concoid	The General Equation of the Second Degree	Youtube classes & blackboard	8
		Intersection of Line with a Conicoid	Black board	8
		Plane of contact	Black board	8
		Enveloping Cone and Cylinder.	Black board	10