GOVERNMENT DEGREE COLLEGE

RAYACHOTY, ANNAMAYYA DISTRICT, A.P.516269

(Accredited with C grade by NAAC)

Department of Mathematics

COs & PSOs MAPPING

B.Sc. Mathematics

UNDER CBCS FRAMEWORK

WITH EFFECT FROM 2015-16

PROGRAM SPECIFIC OUTCOMES FOR B.Sc. MATHEMATICS

Students after successful completion of B.Sc. MATHEMATICS will be able to:	
PSO-1	Think in a critical manner.
PSO-2	Know when there is a need for information to be able to identify, locate, evaluate and effectively use that information for the issue or problem at hand.
PSO-3	Formulate and develop mathematical arguments in a logical manner.
PSO-4	Acquire good knowledge and understanding in advanced areas of Mathematics and Statistics chosen by the student from the given courses.
PSO-5	Understand, formulate and use quantitative models arising in social sciences, business and other contexts.

Title of the Course: Differential Equations

COs ⇓		PSOs ⇓				
		1	2	3	4	5
CO-1	Solve Linear Differential Equations	√	√	√	√	√
CO-2	Convert Non-Exact homogeneous equations to exact differential equations by using integrating factors	√	√	√	√	√
CO-3	Know the Methods of finding solutions differential equations of the first order but not of first degree	√	√	√		√
CO-4	Solve higher order linear differential equations, both homogeneous and non-homogenous equations with constant coefficients	√	√	√	√	√
CO-5	Understand the concept and apply appropriate methods for solving differential equations	√	√	√	√	√

Title of the Course: Three Dimensional Analytical Solid Geometry

COs ⇓		PSOs ⇓				
		1	2	3	4	5
CO-1	Get the knowledge of Planes	√	√	√	√	√
CO-2	Basic idea of lines, Sphere and Cone	√	√	√	√	√
CO-3	Understand the properties of planes, lines, spheres and cones	√	√	√		√
CO-4	Express the problems geometrically and then to get the solution	√	√	√	√	√
CO-5	Using geometric software or physical models to visualize and manipulate cones, aiding in deeper understanding.	√	√	√		√

Title of the Course: Abstract Algebra

COs		PSOs				
		1	2	3	4	5
CO-1	Acquire the basic knowledge and structure of groups, subgroups and cyclic groups	√	√	√	√	√
CO-2	Get the significance of the notation of a normal subgroups	√	√	√	√	
CO-3	Get the behaviour of permutations and operations on them	√	√	√	√	√
CO-4	Study the homomorphisms and Isomorphisms with applications	√	√	√	√	√
CO-5	Understand the ring theory concepts with the help of knowledge in group theory and to prove the theorems	√	√	√	√	

Title of the Course: Real Analysis

COs ⇓		PSOs ⇓				
		1	2	3	4	5
CO-1	Get clear idea about the real numbers and real value functions	√	√	√	√	
CO-2	Obtain the skills of analyzing the concepts and applying appropriate methods for testing convergence of a sequence/ series.	√	√	√	√	√
CO-3	Test the continuity and differentiability and Riemann Integration of a function.	√	√	√	√	√
CO-4	Know the geometrical interpretation of mean value theorems.	√	√	√	√	
CO-5	Understanding and application of the Fundamental Theorem of Calculus, including both parts (evaluation of definite integrals and differentiation of integrals).	√	√	√	√	√

Title of the Course : Linear Algebra

COs ⇓		PSOs ⇓				
		1	2	3	4	5
CO-1	Understand the concepts of vector spaces, subspaces, basis, dimension and their properties.	√	√	√	√	√
CO-2	Understand the concepts of linear transformations and their properties	√		√	√	√
CO-3	Apply Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods	√	√	√	√	√
CO-4	Learn the properties of inner product spaces and determine orthogonality in inner product spaces.	√	√	√	√	√
CO-5	Familiarity with constructing orthonormal bases using the Gram-Schmidt orthogonalization process and its applications.	√	√	√	√	√

Title of the Course: Ring Theory & Vector Calculus

COs ⇩		PSOs ⇩				
		1	2	3	4	5
CO-1	Understand the concepts of Rings, Boolean Rings, Commutative and Non-commutative rings, ZeroDivisors, Integral domains, Division Rings, Fields and Characteristic of a Ring ant their properties.	√	√	√	√	
CO-2	Understand the concepts of subrings, Ideals, Principal ideals, Prime Ideals, Maximal ideals and their properties.	√	√	√	√	√
CO-3	Understand the concepts of Vector Differentiation, Differential Operators, Gradient, Divergent, Curl and their Properties.	√	√	√	√	√
CO-4	Understand the concepts of Vector Integration, Line, Surface and Volume Integrals.	√	√	√	√	
CO-5	Understand the concepts of Gauss Divergence Theorem, Green's Theorem in a Plane, Stoke's Theorem and their Applications.	√	√	√	√	√

Title of the Course: Integral Transforms

COs ⇓		PSOs ⇓				
		1	2	3	4	5
CO-1	Understand the concepts of Application of Laplace Transforms to Solutions Differential Equations with Constant Coefficients.	√	√	√	√	√
CO-2	Understand the concepts of Application of Laplace Transforms to Solutions Differential Equations with Variable Coefficients.	√	√	√	√	√
CO-3	Understand the concepts of Application of Laplace Transforms to Solutions Differential Equations with Partial Differential Equations.	√	√	√	√	
CO-4	Understand the concepts of Application of Laplace Transforms to Integral Equations.	√	√	√	√	√
CO-5	Developing problem-solving skills and critical thinking through solving complex problems and applications involving integral transforms.	√	√	√	√	√

B.Mallikarjuna Reddy — **Lecturer in Mathematics**

Ch.Ramanjaneyulu — **Lecturer in Mathematics**

Dr.P.Harshalatha — **Principal ,GDC Rayachoti**

GOVERNMENT DEGREE COLLEGE

RAYACHOTY, ANNAMAYYA DISTRICT, A.P.516269

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Department of Mathematics

COs & PSOs MAPPING

B.Sc. MATHEMATICS

UNDER REVISED CBCS FRAMEWORK

WITH EFFECT FROM 2020-21

PROGRAM SPECIFIC OUTCOMES FOR B.Sc. MATHEMATICS

Students after successful completion of B.Sc. MATHEMATICS will be able to:	
PSO-1	Think in a critical manner.
PSO-2	Know when there is a need for information to be able to identify, locate, evaluate and effectively use that information for the issue or problem at hand.
PSO-3	Formulate and develop mathematical arguments in a logical manner.
PSO-4	Acquire good knowledge and understanding in advanced areas of Mathematics and Statistics chosen by the student from the given courses.
PSO-5	Understand, formulate and use quantitative models arising in social sciences, business and other contexts.
PSO-6	Understand and adhere to ethical standards and practices in mathematical research and professional activities.
PSO-7	Competence in using computational tools and software for mathematical modeling, simulation, and data analysis.

Title of the Course: Differential Equations

COs		PSOs						
		1	2	3	4	5	6	7
CO-1	Solve Linear Differential Equations	√			√	√	√	√
CO-2	Convert Non-Exact homogeneous equations to exact differential equations by using integrating factors	√			√	√	√	√
CO-3	Know the Methods of finding solutions differential equations of the first order but not of first degree	√	√		√	√	√	
CO-4	Solve higher order linear differential equations, both homogeneous and non-homogenous equations with constant coefficients	√		√	√	√	√	√

CO-5	Understand the concept and apply appropriate methods for solving differential equations	√		√	√	√	√	√

Title of the Course: Three Dimensional Analytical Solid Geometry

COs ⇓		PSOs ⇓						
		1	2	3	4	5	6	7
CO-1	Get the knowledge of Planes	√	√		√	√	√	√
CO-2	Basic idea of lines, Sphere and Cone	√	√		√	√	√	√
CO-3	Understand the properties of planes, lines, spheres and cones	√	√		√	√	√	
CO-4	Express the problems geometrically and then to get the solution	√	√		√	√	√	√
CO-5	Using geometric software or physical models to visualize and manipulate cones, aiding in deeper understanding.	√	√		√	√	√	

Title of the Course: Abstract Algebra

COs		PSOs						
		1	2	3	4	5	6	7
CO-1	Acquire the basic knowledge and structure of groups, subgroups and cyclic groups	√	√	√	√	√	√	√
CO-2	Get the significance of the notation of a normal subgroups	√	√	√	√	√	√	
CO-3	Get the behaviour of permutations and operations on them	√	√	√	√	√	√	√
CO-4	Study the homomorphisms and Isomorphisms with applications	√	√	√	√	√	√	√
CO-5	Understand the ring theory concepts with the help of knowledge in group theory and to prove the theorems	√	√	√	√	√	√	

Title of the Course: Real Analysis

COs ⇓		PSOs ⇓						
		1	2	3	4	5	6	7
CO-1	Get clear idea about the real numbers and real value functions	√		√	√	√	√	
CO-2	Obtain the skills of analyzing the concepts and applying appropriate methods for testing convergence of a sequence/ series.	√		√	√	√	√	√
CO-3	Test the continuity and differentiability and Riemann Integration of a function.	√		√	√	√	√	√
CO-4	Know the geometrical interpretation of mean value theorems.	√		√	√	√	√	

CO-5	Understanding and application of the Fundamental Theorem of Calculus, including both parts (evaluation of definite integrals and differentiation of integrals).	√		√	√	√	√	√

Title of the Course: Linear Algebra

COs ⇩		PSOs ⇩						
		1	2	3	4	5	6	7
CO-1	Understand the concepts of vector spaces, subspaces, basis, dimension and their properties.	√	√	√	√	√	√	√
CO-2	Understand the concepts of linear transformations and their properties	√		√	√	√	√	
CO-3	Apply Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods	√	√	√	√	√	√	√
CO-4	Learn the properties of inner product spaces and determine orthogonality in inner product spaces.	√	√	√	√	√	√	
CO-5	Familiarity with constructing orthonormal bases using the Gram-Schmidt orthogonalization process and its applications.	√	√	√	√	√	√	√

Title of the Course: Multiple Integrals and Applications of Vector Calculus

COs ⇓		PSOs ⇓						
		1	2	3	4	5	6	7
CO-1	Learn multiple integrals as a natural extension of definite integral to a function of two variables in the case of double integral / three variables in the case of triple integral.	√	√	√	√	√	√	
CO-2	Learn applications in terms of finding surface area by double integral and volume by triple integral.	√		√	√	√	√	√
CO-3	Determine the gradient, divergence and curl of a vector and vector identities.	√	√	√	√	√	√	√
CO-4	Evaluate line, surface and volume integrals.	√	√	√	√	√	√	
CO-5	Understand relation between surface and volume integrals (Gauss divergence theorem), relation between line integral and volume integral (Green's theorem), relation between line and surface integral (Stokes theorem)	√	√	√	√	√	√	√

Title of the Course: Integral Transforms with Applications

COs ⇓		PSOs ⇓						
		1	2	3	4	5	6	7
CO-1	Evaluate Laplace transforms of certain functions, find Laplace transforms of derivatives and of integrals.	√	√	√	√	√	√	√
CO-2	Determine properties of Laplace transform which may be solved by application of special functions namely Dirac delta function, error function, Bessel function and periodic function.	√	√	√	√	√	√	√
CO-3	Understand properties of inverse Laplace transforms, find inverse Laplace transforms of derivatives and of integrals.	√	√	√	√	√	√	
CO-4	Solve ordinary differential equations with constant/ variable coefficients by using Laplace transform method.	√	√	√	√	√	√	√
CO-5	Comprehend the properties of Fourier transforms and solve problems related to finite Fourier transforms	√	√	√	√	√	√	√

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Department of Mathematics

COs & PSOs MAPPING

B.Sc. HONOURS MATHEMATICS (MINOR)

4-YEARS UG HONOURS PROGRAM WITH SINGLE MAJOR AND ONE MINOR

WITH EFFECT FROM 2023-24

PROGRAM SPECIFIC OUTCOMES FOR B.Sc. HONOURS MATHEMATICS (MINOR)

Students after successful completion of B.Sc. MATHEMATICS will be able to:	
PSO-1	Think in a critical manner.
PSO-2	Know when there is a need for information to be able to identify, locate, evaluate and effectively use that information for the issue or problem at hand.
PSO-3	Formulate and develop mathematical arguments in a logical manner.
PSO-4	Acquire good knowledge and understanding in advanced areas of Mathematics and Statistics chosen by the student from the given courses.
PSO-5	Understand, formulate and use quantitative models arising in social sciences, business and other contexts.
PSO-6	Understand and adhere to ethical standards and practices in mathematical research and professional activities.
PSO-7	Competence in using computational tools and software for mathematical modeling, simulation, and data analysis.
PSO-8	Effectively communicate mathematical ideas, theories, and results orally and in writing to both technical and non-technical audiences.

Title of the Course: Differential Equations

COs ⇓		PSOs ⇓							
		1	2	3	4	5	6	7	8
CO-1	Solve Linear Differential Equations	√			√	√	√	√	√
CO-2	Convert Non-Exact homogeneous equations to exact differential equations by using integrating factors	√		√	√	√	√	√	
CO-3	Know the Methods of finding solutions differential equations of the first order but not of first degree	√		√	√	√	√		√
CO-4	Solve higher order linear differential equations, both homogeneous and non-homogenous equations with constant coefficients	√	√		√	√	√	√	√
CO-5	Understand the concept and apply appropriate methods for solving differential equations	√			√	√	√	√	√

Title of the Course: GROUP THEORY

COs		PSOs							
		1	2	3	4	5	6	7	8
CO-1	acquire the basic knowledge and structure of groups	√	√	√	√	√	√	√	√
CO-2	get the significance of the notation of a subgroup and cosets.	√	√	√	√	√	√		√
CO-3	understand the concept of normal subgroups and properties of normal subgroup	√	√	√	√	√	√	√	√
CO-4	study the homomorphisms and isomorphisms with applications.	√	√	√	√	√	√	√	√
CO-5	understand the properties of permutation and cyclic groups	√	√	√	√	√	√		√

Title of the Course: RING THEORY

COs ⇓		PSOs ⇓							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
CO-1	acquire the basic knowledge of rings, fields and integral domains	√	√	√	√		√		√
CO-2	get the knowledge of subrings and ideals	√	√	√	√	√	√	√	√
CO-3	construct composition tables for finite quotient rings	√	√	√	√	√	√	√	√
CO-4	study the homomorphisms and isomorphisms with applications.	√	√	√	√		√	√	√
CO-5	get the idea of division algorithm of polynomials over a field.	√	√	√	√	√		√	

Title of the Course: INTRODUCTION TO REAL ANALYSIS

COs		PSOs							
		1	2	3	4	5	6	7	8
CO-1	get clear idea about the real number sand real valued functions.	√	√	√	√		√		√
CO-2	obtaintheskillsofanalysingtheconceptsandapplyingappropriatemethodsfortesting convergence of a sequence/ series.	√	√	√	√	√	√	√	√
CO-3	Test the continuity and differentiability and Riemann integration of a function.	√	√	√	√	√	√	√	√
CO-4	Know the geometrical interpretation of mean value theorems.	√	√	√	√		√		√
CO-5	know about the fundamental theorem of integral calculus	√	√	√	√	√	√	√	√

Title of the Course: LINEAR ALGEBRA

COs		PSOs							
		1	2	3	4	5	6	7	8
CO-1	understand the concepts of vector spaces, subspaces	√	√	√	√	√	√	√	
CO-2	understand the concepts of basis, dimension and their properties	√		√	√	√	√		√
CO-3	understand the concept of linear transformation and its properties	√	√	√	√	√	√	√	√
CO-4	apply Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods	√	√	√	√	√	√		√
CO-5	learn the properties of inner product spaces and determine orthogonality in inner product spaces.	√	√	√	√	√	√	√	

Title of the Course: VECTOR CALCULUS

COs ⇩		PSOs ⇩							
		1	2	3	4	5	6	7	8
CO-1	Learn multiple integrals as a natural extension of definite integral to a function of two variables in the case of double integral/three variables in the case of triple integral.	√	√	√	√	√	√		√
CO-2	Learnapplicationsintermsoffindingsurfaceareabydoubleintegralandvolumebytripleintegral	√		√	√	√	√	√	√
CO-3	Determine the gradient, divergence and curl of a vector and vector identities.	√	√	√	√	√	√	√	√
CO-4	Evaluate line, surface and volume integrals.	√	√	√	√	√	√		
CO-5	understand relation between surface and volume integrals (Gauss divergence theorem),relation between lineintegral and volume integral(Green'stheorem),relation between line and surface integral(Stokes theorem)	√	√	√	√	√	√	√	

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