

# **K. V. R. Govt. College for Women (A), Kurnool**

## **Department of Mathematics**

### **Program Outcomes and Program Specific Outcomes**

<b>S.No.</b>	<b>Course</b>	<b>Combinations</b>	<b>Program Outcomes</b>	<b>Program Specific Outcomes</b>
1	B.Sc. (MPC EM & TM)	Mathematics, Physics, Chemistry	Possess a sound understanding of the theoretical foundations of various core subjects. • Acquire analytical and logical thinking skills necessary to pursue higher education. • Gain employment at entry level positions based on program curriculum.	The combination integrating all Basic Science courses lays a strong foundation and prepares the learner for Post Graduation research in respective disciplines
2	B.Sc. (MPCs.)	Mathematics, Physics, Computer Science	Possess a sound understanding of the theoretical foundations of various core subjects. • Acquire analytical and logical thinking skills necessary to pursue higher education. • Gain employment at entry level positions based on program curriculum.	Master a broad set of knowledge concerning the fundamentals in the basic areas of Physics and Mathematics added with the necessary hands-on experience in various practical aspects of problem solving/programming/experimentation. The program imparts students with an understanding of the basics of Computer

				Science, to develop proficiency in the practice of computing, and to prepare them for continued professional development.
3	B.Sc. (MCDs.)	Mathematics, Computer Science, Data Science	<p>Possess a sound understanding of the theoretical foundations of various core subjects.</p> <ul style="list-style-type: none"> <li>• Acquire analytical and logical thinking skills necessary to pursue higher education.</li> <li>• Gain employment at entry level positions based on program curriculum.</li> </ul>	<p>Develop proficiency in high level mathematical methods, experimental techniques, and data analysis and presentation competence. Effectively use the software - MS Excel and R</p>

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### Course Outcomes

S.No.	Paper Code	Paper Title	CO	Course Outcomes
1	1221	Differential Equations	CO1	Understand how to differentiate linear and non-linear Differential Equations
			CO2	understand some basic definitions, Find the envelopes and orthogonal trajectories of the family of different surfaces
			CO3	Understand How to resolve the differential equations into rational and solve it.
			CO4	Solve equations for p, x and y, explain Clairaut's equation
			CO5	To find solution of higher-order linear differential equations with variable coefficients, Solves the Cauchy-Euler equations
2	2221	Three Dimensional Geometry	CO1	Understand geometrical terminology for angles, triangles, quadrilaterals and circles, measure angles using a protractor, use geometrical results to determine unknown angles
			CO2	Define parallel lines, Recognize and create parallel lines on graphs and with equations, define perpendicular lines, Recognize and create graphs and equations of perpendicular lines

			CO3	Understand the equation of the tangent plane and use the tangent plane as a local linear approximation to the surface
			CO4	Understand how to use cylinder and cone, Identify the shape of the surface of a cylinder and cone, Measure the surface area of a cylinder and a cone, finding volume of a cylinder and cone
3	3221	Abstract Algebra	CO1	Trained in the Basic concepts of Groups, Subgroups
			CO2	Apply the learned concepts to Normal subgroups, Homomorphism and Cyclic groups
			CO3	Attain knowledge in Rings, Sub rings, Ideals
			CO4	Further learn Isomorphisms and polynomial rings
4	4221	Real Analysis	CO1	Understand the concepts of limits, Continuity, Discontinuity, Uniform Continuity
			CO2	Analyze Derivatives and apply Mean value Theorems
			CO3	Understand the Concept of Sequences and Series and interpret series Tests
			CO4	Identify Riemann Integral functions
			CO5	Applicable for our professional, social and intellectual lives.
5	5221	Linear Algebra and Vector Calculus	CO1	Vector Spaces, Sub Spaces, Linear Combination, Dimension of Vector Space and Subspace. Definitions, Operations on vectors and scalars

			CO2	Rank and Nullity of Linear Transformations, Invertible Linear Transformations. Ordinary derivatives of vectors , Continuity, Gradient, Divergence, Curl
			CO3	Sylvester's Law of Nullity and Cayley Hamilton Theorem. Vector Integration
			CO4	Inner Product Spaces.
6	5222	Ring Theory and Vector Calculus	CO1	Understand the concepts of vectors and scalars and will be able to perform the calculations on dot, cross and triple products
			CO2	Understand space curves and partial derivatives of vectors as well perform calculations on gradient t, divergence and curl operators.
			CO3	Analyze line, surface and volume integrals and estimate the change of order of integration as well as the change of variable in double integration Green's Theorem in a plane, Gauss Divergence theorem, Stokes theorem & Applications of these theorems.
			CO4	Understand the application of Green's Gauss and Stokes theorems
7	6221	Numerical Analysis	CO1	Analyze and detect different form of errors and also will be able to solve Algebraic and Transcendental equations using different methods
			CO2	Interpolate the functions within the range using equally and un equally spaced points

			CO3	<p>Upon completion of this module the student should :</p> <ol style="list-style-type: none"> <li>1. Understand the Least Squares Method</li> <li>2. Be able to curve fit data using several types of curves (straight line, second degree parabola, power curve, exponential curve)</li> <li>3. Obtain numerical approximations to the first and second derivatives of certain functions</li> <li>4. Calculate a definite integral using an appropriate numerical method</li> </ol>
			CO4	To solve the solution of a linear system of equations using direct or iterative methods
			CO5	To solve the selected class of differential equations using Taylor, Picards, Euler's, Runge Kutta, Adams and Milne's
8	6222	Integral Transforms	CO1	Applications of Laplace transforms to Differential Equations
			CO2	Applications of Laplace transforms to Integral Equations
			CO3	Applications of Fourier Transforms
			CO4	Applications of Finite Fourier Transforms.
9	6223	Advanced Numerical Analysis	CO1	Curve Fitting
			CO2	Numerical Differentiation
			CO3	Numerical Integration
			CO4	Solution of simultaneous Linear system of Equations
			CO5	Numerical solution of ordinary differential equations

10	6224	Project work	CO1	Communicate mathematics effectively.
			CO2	Demonstrate a computational ability in solving a wide array of mathematical problems
			CO3	Differentiate between valid and invalid mathematical reasoning
			CO4	Develop mathematical ideas from basic axioms, Utilize mathematics to solve theoretical and applied problems
			CO5	Identify applications of mathematics in other disciplines and in society