



# GOVERNMENT DEGREE COLLEGE, RAJAMPETA

(Affiliated to yogi vema university, Kadapa)  
(Re-accredited by NAAC with "B+" Grade in cycle - III)  
Rajampet-516115



## Department of Mathematics 2025-26

### 1. Institutional Program Outcomes (POs)

- **PO 1 (Critical Thinking):** Identify assumptions and check their accuracy to take informed actions.
- **PO 2 (Effective Communication):** Communicate clearly in English and a native language.
- **PO 3 (Social Interaction):** Mediate disagreements and reach conclusions in group settings.
- **PO 4 (Effective Citizenship):** Demonstrate empathetic social concern and equity-centered national development.
- **PO 5 (Ethics):** Recognize different value systems and understand moral dimensions of decisions.
- **PO 6 (Environment & Sustainability):** Understand environmental contexts and sustainable development.
- **PO 7 (Self-directed Learning):** Engage in independent and life-long learning in socio-technological changes.

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### 2. Program Specific Outcomes (PSOs) - Mathematics

- **PSO 1:** Develop foundational knowledge in Algebra, Calculus, and Analysis for logical proofs.
- **PSO 2:** Apply mathematical theories to problems in Physics and Chemistry.
- **PSO 3:** Proficiency in Numerical Methods and Integral Transforms for scientific modelling.
- **PSO 4:** Visualization and solving of 3D problems through Solid Geometry and Vector Calculus.
- **PSO 5:** Create and analyse mathematical models for real-life phenomena (Economics/Biology).
- **PSO 6:** Use modern tools and problem-solving sessions for quantitative challenges.

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### 3. Course Outcomes (COs) & Mapping (Semesters I - IV)

#### SEMESTER I

##### Course 1: Essentials & Applications of Mathematical, Physical & Chemical Sciences

- **CO 1:** Apply critical thinking to solve problems in Trigonometry and Statistics.
- **CO 2:** Connect basic principles of Physics and Chemistry to everyday life.
- **CO 3:** Understand the interdisciplinary role of Math in other sciences.
- **Mapping:** High correlation with **PO 1** and **PSO 2**.

##### Course 2: Advances in Mathematical, Physical & Chemical Sciences

- **CO 1:** Understand the role of Math in Nanotechnology and Quantum Mechanics.
- **CO 2:** Analyse big data and its applications in modern technology.
- **CO 3:** Evaluate advancements in semiconductor and material sciences.
- **Mapping:** High correlation with **PO 7** and **PSO 6**.

#### SEMESTER II

##### Course 3: Differential Equations

- **CO 1:** Solve first-order linear and exact differential equations.
- **CO 2:** Solve higher-order linear differential equations with constant coefficients.
- **CO 3:** Model physical phenomena like oscillation and growth using DEs.
- **Mapping:** High correlation with **PSO 1** and **PSO 5**.

##### Course 4: Analytical Solid Geometry

- **CO 1:** Understand the geometry of planes, lines, and spheres in 3D.
- **CO 2:** Analyse the properties of cones and cylinders.
- **CO 3:** Visualize spatial relationships through mathematical equations.
- **Mapping:** High correlation with **PSO 4**.

#### SEMESTER III

##### Course 5: Group Theory

- **CO 1:** Master the concepts of groups, subgroups, and cosets.
- **CO 2:** Understand Lagrange's theorem and its applications.
- **CO 3:** Analyse normal subgroups and homomorphisms.

- **Mapping:** High correlation with **PSO 1**.

#### **Course 6: Numerical Methods**

- **CO 1:** Solve algebraic and transcendental equations using iterative methods.
- **CO 2:** Apply interpolation techniques for data analysis.
- **CO 3:** Execute numerical differentiation and integration.
- **Mapping:** High correlation with **PSO 3** and **PSO 6**.

### **SEMESTER IV**

#### **Course 7: Laplace Transforms**

- **CO 1:** Understand Laplace and Inverse Laplace transforms of standard functions.
- **CO 2:** Apply transforms to solve ordinary differential equations.
- **CO 3:** Use convolution theorem for solving integral equations.
- **Mapping:** High correlation with **PSO 3**.

#### **Course 8: Special Functions**

- **CO 1:** Understand Beta and Gamma functions and their properties.
- **CO 2:** Solve Legendre and Bessel differential equations.
- **CO 3:** Analyse the orthogonality of Hermite and Laguerre polynomials.
- **Mapping:** High correlation with **PSO 1** and **PSO 3**.

#### **Course 9: Ring Theory**

- **CO 1:** Understand the structure of Rings, Integral Domains, and Fields.
- **CO 2:** Analyse ideals and quotient rings.
- **CO 3:** Master the fundamentals of Euclidean domains and Unique Factorization Domains.
- **Mapping:** High correlation with **PSO 1**.

#### **Course 10: Introduction to Real Analysis**

- **CO 1:** Understand the properties of real numbers and limits of sequences.
- **CO 2:** Test the convergence of infinite series using various tests.
- **CO 3:** Analyse the Riemann integrability of continuous functions.
- **Mapping:** High correlation with **PO 1** and **PSO 1**.

#### 4. Consolidated Mapping Matrix (High-Level)

Course Number	Paper Title	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
1	Essentials of Sciences	√	√				
2	Advances in Sciences						√
3	Differential Equations	√		√		√	√
4	Solid Geometry				√		
5	Group Theory	√					
6	Numerical Methods			√			√
7	Laplace Transforms			√			√
8	Special Functions	√		√			
9	Ring Theory	√					
10	Real Analysis	√					