

**PROGRAM OUTCOMES (PO) AND COURSE OUTCOMES (CO)**

**BACHOLAR OF SCIENCE IN MATHEMATICS (B.Sc. MATHEMATICS) PROGRAM**

**Program Outcomes:**

1. Mathematical knowledge
2. Problem solving
3. Analytical thinking
4. Research and innovation
5. Effective communication
6. Ethics and Professionalism
7. Lifelong learning
8. Teamwork and leadership

**Program Specific Outcomes:**

1. PSO 1: Deep Understanding of Core Concepts

Gain in-depth knowledge of fundamental mathematical concepts including algebra, calculus, differential equations, real analysis

2. PSO 2: Mathematical Modelling and Applications

Apply mathematical theories and techniques to model real-world problems in fields like physics, engineering, economics, biology, and social sciences.

3. PSO 3: Use of Technology in Mathematics

Develop computational skills using mathematical software (e.g., MATLAB, Python) for solving complex mathematical problems.

4. PSO 4: Research and Project Skills

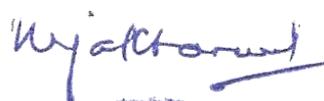
Undertake mathematical investigations, prepare project reports, and develop research aptitude in pure or applied mathematics.

5. PSO 5: Logical and Analytical Thinking

Enhance logical reasoning, analytical thinking, and problem-solving abilities to pursue careers in academia, research, data science, finance, or government sectors.

6. PSO 6: Preparation for Competitive Exams and Higher Studies

Build a strong foundation for advanced studies in Mathematics or related fields and competitive exams like CSIR-NET, GATE, UPSC, etc.



**PRINCIPAL**  
**Mrs. K.M.P.M. VOCATIONAL COLLEGE**  
**BISTUPUR, JAMSHEDPUR**

# COURSE OUTCOME

<b>SEMESTER- 1</b>			
<b>SL NO.</b>	<b>PAPER</b>	<b>PAPER CODE</b>	<b>COURSE OUTCOMES</b>
01	Calculus	MJ-1	Use integration to solve real-world problems involving area under curves, volumes of solids of revolution, arc length, and surface area.  The students will be able to do different problem like limit, differentiation.
<b>SEMESTER- 2</b>			
01	Matrices	MJ-2	Use matrix methods such as Rank and matrix inversion to solve systems of linear equations.  Find eigenvalues and eigenvectors of matrices and apply them to problems in diagonalization and dynamical systems.
02	Analytical geometry and trigonometry	MJ-3	Explain the basics of 2D and 3D coordinate systems, distance, section formula, and direction cosines, plane, sphere, cone, cylinder.  Represent complex numbers in trigonometric form and use De Moivre's Theorem for powers and roots of complex numbers.
<b>SEMESTER- 3</b>			
01	Real Analysis	MJ-4	Understand and determine the convergence, divergence, and boundedness of sequences using rigorous definitions.
02	Vectors	MJ-5	Define and perform operations on vectors (addition, scalar multiplication, dot product, cross product) and apply their geometric interpretations.  Understand and apply the concepts of gradient, divergence, and curl to scalar and vector fields.
<b>SEMESTER- 4</b>			
01	Real analysis and set theory	MJ-6	Understand Riemann integrability, compute definite integrals, and examine properties of integral functions.  Define relations and functions, and explore their properties such as domain, range, inverse, injectivity, surjectivity, and bijectivity.
02	Ordinary differential equation	MJ-7	Solve first-order ODEs using methods such as separation of variables, integrating factor, homogeneous and exact equations.  Solve second and higher-order linear ODEs with constant coefficients and variable coefficients using standard methods.
03	Group theory	MJ-8	Define groups, subgroups, and cyclic groups with examples, and verify group axioms in various algebraic structures.  Define and analyze group homomorphisms and isomorphisms, and understand kernels and images

*K. M. P. M.*