RAYAT SHIKSHAN SANSTHA'S
ARTS, SCIENCE AND COMMERCE COLLEGE, MOKHADA, DIST. PALGHAR
DEPARTMENT OF MATHEMATICS

BRIEF INFORMATION

The department of Mathematics was established on June 2013 in this college to provide knowledge of animals and applied aspects of Mathematics. The department served tribal society by producing at least 10 Mathematics graduates per year. Many of our students are progressed to higher education, many of the students have entered the field of computer science, thanks to the varied approach of Syllabus. The department is serving to the tribal students for the betterment of society. The department is well acquainted with the traditional and advanced instruments including like Computer, Printer, etc.

VISION, MISSION AND OBJECTIVES

- Vision
  - To inculcate values of Mathematics among the tribal students so that students can learn and become competent users of Mathematics and its application in various disciplines.
- Mission
  - To provide quality mathematical education to the tribal students
  - To provide platform to acquire abilities to evaluate problems using analytical /numerical/ graphical techniques
  - To provide a back ground for relating mathematical techniques.
- Objectives
  - To create the interest in mathematics among the students.
  - To provide basic and applied knowledge of various branches of Mathematics.
  - To develop abstract, logical & critical thinking and inculcate the research culture among the students.
  - Appreciate the usefulness power and beauty of Mathematics.

- Become Confident in using mathematics to analysis and solve problems both in academic and in real life situations

OUR STAFF

Sr. No.	Name of the Teacher	Designation	Qualification	Experience
1.	Mr. P. K. Patil	Assistant Professor	M.Sc., SET, B.Ed.	07 years
2.	Mr. J. D. Gangode	Assistant Professor	M.Sc., SET	03 months
3.	Mr. A. V. Mulani	Assistant Professor	M.Sc.	05 years

PROGRAM SPECIFIC OUTCOME

At the completion of B.Sc. (Mathematics) the learner will be graduated with following outcomes:

- Ability to acquire in-depth knowledge of Algebra, Calculus, Geometry, Differential equations and several other branches of Mathematics. This also leads to study of related areas like Computer science, Physical science, Chemical science and Life science. Thus, this Program helps learners in building a solid foundation for higher studies in Mathematics.
- Utilize mathematics to solve theoretical and applied problems by critical understanding, analysis and synthesis.
- Ability to communicate mathematics effectively by written, computational and graphic means.
- Create mathematical ideas from basic axioms.
- Ability to apply multivariable calculus tools in Physics, Economics, Optimization and understanding the architecture of curves and surfaces in plane and space etc.

The learner will be well acquainted with the knowledge which will help them to become entrepreneur and/or to serve the nation for the betterment of society

COURSE OUTCOMES

Sr. No.	Unit	Outcome
F.Y.B.Sc. Sem. I & II, Paper 1 Calculus-I & Calculus-II		
1.	All units	This course gives introduction to basic concepts of Analysis with rigor and prepares students to study further courses in Analysis. Formal proofs are given lot of emphasis in this course which also enhances understanding of the subject of Mathematics as a whole. The portion on first order, first degree

		differentials prepares learner to get solutions of so many kinds of problems in all subjects of Science and also prepares learner for further studies of differential equations and related fields.
F.Y.B.Sc. Sem. I & II, Paper 2 **Algebra-I (Sem. I) & Discrete Mathematics (Sem. II)**		
2.	All units	This course gives expositions to number systems (Natural Numbers & Integers), like divisibility and prime numbers and their properties. These topics later find use in advanced subjects like cryptography and its uses in cyber security and such related fields.
S.Y.B.Sc. Sem. III & IV, Paper 1 **Calculus (Sem. III) & Multivariable Calculus I(Sem. IV)**		
3.	All units	This course gives introduction to basic concepts of Analysis with rigor and prepares students to study further courses in Analysis. Formal proofs are given lot of emphasis in this course which also enhances understanding of the subject of Mathematics as a whole
S.Y.B.Sc. Sem. III & IV, Paper 2 **Linear Algebra I (Sem III) & Linear Algebra II (Sem IV)**		
4.	All units	This course gives expositions to system of linear equations and matrices, Vector spaces, Basis and dimension, Linear Transformation, Inner product space, Eigen values and eigenvectors.
S.Y.B.Sc. Sem. III, Paper 3 **Ordinary Differential Equations**		
5.	All units	Ordinary Differential Equations prepares learner to get solutions of so many kinds of problems in all subjects of Science and also prepares learner for further studies of differential equations and related fields.
S.Y.B.Sc. Sem. IV, Paper 3 **Numerical Methods**		
		Lerner will learn different types of Numerical methods to apply in different fields of Mathematics.
T.Y.B.Sc. Sem. V, Paper 1 **Multivariable Calculus II**		
6.	All units	In this course students will learn the basic ideas, tools and techniques of integral calculus and use them to solve problems from real-life applications including science and engineering problems involving areas, volumes, centroid, Moments of mass and center of mass Moments of inertia. Examine vector fields and dene and evaluate line integrals using the Fundamental Theorem of Line Integrals and Green's Theorem; compute arc length.

T.Y.B.Sc. Sem. VI, Paper 1 **Basic Complex Analysis**		
7.	All units	Students Analyze sequences and series of analytic functions and types of convergence, Students will also be able to evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem in its various versions, and the Cauchy integral formula, they will also be able to represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and evaluate complex integrals using the residue theorem.
T.Y.B.Sc. Sem. V, Sem. VI Paper 2 Group Theory, Ring Theory (Sem V, Sem VI)		
8.	All units	Students will have a working knowledge of important mathematical concepts in abstract algebra such as definition of a group, order of a finite group and order of an element, rings, Euclidean domain, Principal ideal domain and Unique factorization domain. Students will also understand the connection and transition between previously studied mathematics and more advanced mathematics. The students will actively participate in the transition of important concepts such homomorphisms & isomorphisms from discrete mathematics to advanced abstract mathematics.
T.Y.B.Sc. Sem. V, Sem. VI Paper 3 Topology of metric spaces (Sem V), Topology of metric spaces and real analysis (Sem VI)		
9.	All units	This course introduces students to the idea of metric spaces. It extends the ideas of open sets, closed sets and continuity to the more general setting of metric spaces along with concepts such as compactness and connectedness. Convergence concepts of sequences and series of functions, power series are also dealt with. Formal proofs are given a lot of emphasis in this course. This course serves as a foundation to advanced courses in analysis. Apart from understanding the concepts introduced, the treatment of this course will enable the learner to explain their reasoning about analysis with clarity and rigour.
T.Y.B.Sc. Sem. V, Sem. VI Paper 4 (Elective-C) **Graph Theory**		
10.	All units	Upon successful completion of Graph Theory course, a student will be able to: 1. Demonstrate the knowledge of fundamental concepts in graph theory, including properties and characterization of graphs and trees. 2. Describe knowledgeably special classes of graphs that arise frequently in graph theory 3. Describe the concept of isomorphic graphs and isomorphism invariant properties of graphs

		4. Describe and apply the relationship between the properties of a matrix representation of a graph and the structure of the underlying graph 5. Demonstrate different types of algorithms including Dijkstra's, BFS, DFS, MST and Huffman coding. 6. Understand the concept of Eulerian graphs and Hamiltonian graphs. 7. Describe real-world applications of graph theory.
T.Y.B.Sc. Sem. VI, Paper 4 (Elective-C) Graph Theory and Combinatorics		
11.	All units	Upon successful completion of Graph Theory course, a student will be able to: 1. Understand and apply the basic concepts of graph theory, including colouring of graph, to find chromatic number and chromatic polynomials for graphs 2. Understand the concept of vertex connectivity, edge connectivity in graphs and Whitney's theorem on 2-vertex connected graphs. 3. Derive some properties of planarity and Euler's formula, develop the under-standing of Geometric duals in Planar Graphs 4. Know the applications of graph theory to network flows theory. 5. Understand different applications of system of distinct representative and matching theory. 6. Use permutations and combinations to solve counting problems with sets and multisets. 7. Set up and solve a linear recurrence relation and apply the inclusion/exclusion principle. 8. Compute a generating function and apply them to combinatorial problems.

SHORT TERM COURSES OF THE DEPARTMENT (2022-2023)

1. **A Short Term Course on Solar Photovoltaic System**

2. **Certificate course on Applied Mathematics & Statistical techniques**

EXTENSION ACTIVITIES (2022-2023)

- **Guest lecture on "Career Scope in Mathematics" at K.B.P. Aashramshala Mokhada, Tal. Mokhada, Dist. Palghar**

BEST PRACTICE (2022-2023)

- Student's presentation on "Mathematician & their contribution in the field of Mathematics"

INNOVATIVE PROJECT

- Making and use of "Colour/Rangoli Pendulum"

FUTURE PLAN

- To start Master degree program