



**GKSM Govt College TandaUrmar**

**B.A/B.Sc(Non Medical)**

**(Department of Mathematics)**

**Pos and Cos**



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## PROGRAMME OUTCOMES (POs)

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| PO1 | A graduate student in B.Sc (N.M) can pursue academic courses like B.Ed ,M.Sc ,M.Phil and research .  |
| PO2 | . The programme provides in-depth knowledge of particular subject and arouses interest of the students towards research in that particular field.  |
| PO3 | The students can also take up professional courses like M.C.A.,M.B.A,which is the best option for a mathematics graduate who wish to pursue his/her career in I.T sector and M.B.A for those who wish to pursue their career in management field . |
| PO4 | The students can also explore areas like Banking ,Accounting ,Civil Services and other competitive examination.  |



## COURSE OUTCOMES (COs)

### Semester-I

#### Paper I: Plane Geometry

|      |   |
|------|---|
| CO1  | Students will study the concept of transformation of axes in two dimensions.  |
| CO2  | Students will study about the pair of straight lines, their joint equation, angle between them and some properties related to it. |
| CO-3 | Students will study about circle and its properties.  |
| CO4  | Students will study about conics as parabola, ellipse and hyperbola and its properties.   |
| CO5  | Students will be able to identify the conics from general second degree equation.   |

#### Paper II: Calculus-I

|      |   |
|------|---|
| CO1  | Students will understand the concept of real numbers and how to solve different inequalities. |
| CO2  | Students will learn the boundedness of sets and how to compute bounds of a set if exists.     |
| CO-3 | Students will study the concept of Limit and Continuity and its application.                  |



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| CO4 | Students will learn how to use Taylor's Theorem for expansion of one variable function.      |
| CO5 | Students will be able to know how indeterminate limits can be evaluated by L' Hospital Rule. |

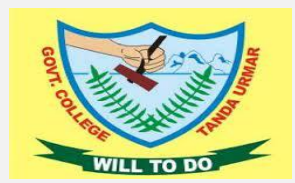
## Paper III: Trigonometry and Matrices

|      |  |
|------|--|
| CO1  | Students will study about the concept of complex number, Demoivre's theorem and its applications.  |
| CO2  | Students will study about some elementary function of a complex variable   |
| CO-3 | Students will able to sum the different trigonometry series  |
| CO4  | Students will study about some special matrices such as Hermitian and skew Hermitian Matrices. They will able to find rank of square matrix and Eigen values and vectors of a square matrix. |
| CO5  | Students will study the various methods to solve Linear Equation   |

## Semester II

### Paper I: Solid Geometry

|     |  |
|-----|--|
| CO1 | Students will study about the concept of transformation of axes in three dimensions. |
| CO2 | Students will study about sphere and its properties.                                 |
| CO3 | Students will learn to know about the cylinder and cone and their applications.      |
| CO4 | Students will learn how to find surfaces of revolution of different curves.          |



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## Paper II: Calculus-II

|     |  |
|-----|--|
| CO1 | Students will learn about concavity, convexity of curves, asymptotes and multiple points of the curve. |
| CO2 | Students will know how to trace the graph of curves.   |
| CO3 | Students will be able to learn how to evaluate the integral of functions by reduction formula.         |

## Paper III: Theory of Equations

|     |   |
|-----|---|
| CO1 | Students will able to illustrate the Division and Euclid's algorithm.                                   |
| CO2 | Students will able to describe the Relation between roots and coefficient.                              |
| CO3 | Students will able to compute integral roots of an equation by Newton's method.                         |
| CO4 | Students will be able to learn how to evaluate trigonometric solutions of a real cubic with real roots. |

## Semester III

### Paper I: Advanced Calculus-I

|     |  |
|-----|--|
| CO1 | Students will learn the concept of Limits, Continuity of Function of two and three variable. |
|-----|--|



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|     |   |
| CO2 | Students will learn about partial derivation and differentiability of real valued function. |
| CO3 | Students will learn to expand function of variables by Taylor's Theorem.                    |
| CO4 | Students will learn to find Jacobians, maxima and minima, saddle points of function.        |

## Paper II: Differential Equations-I

|     |  |
|-----|--|
| CO1 | Differential equations help students to understand study of change of different functions.   |
| CO2 | Students will be able to solve differential equations with constant and variable coefficients.   |
| CO3 | Students will able to solve problems in ordinary differential equations, dynamical systems, stability theory, and a number of applications to scientific and engineering problems. |

## Paper III: Statics

|     |   |
|-----|---|
| CO1 | Students will learn about the different kinds of balanced forces acting on a particle.                                |
| CO2 | Students will study the concept of coplanar forces, parallel forces, their resultant and how to find their resultant. |
| CO3 | Students will learn the concept of Moments and Couples, Varignon's Theorem of moments and equilibrium of forces       |



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|     |   |
|-----|---|
| CO4 | Students will study the concept of friction, coefficient of friction and angle of friction. |
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## Semester IV

### Paper I: Advanced Calculus-II

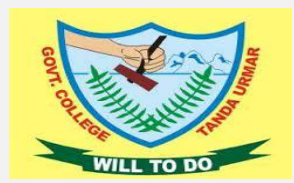
|     |  |
|-----|--|
| CO1 | Students will Study the concept of sequential continuity and uniform continuity.         |
| CO2 | Students will learn about the sequence and series of real numbers and their convergence. |
| CO3 | Students will be able to check the convergence of series by suitable methods.            |
| CO4 | Students will study the concept of rearrangement of terms.                               |

### Paper II: Differential Equations-II

|     |  |
|-----|--|
| CO1 | Students will study non-linear partial differential equations of first order and various methods to solve them such as Charpit's Method and Jacobi's Method. |
| CO2 | Students will learn about second-order partial differential equation and its various types. They also study various methods to solve them.                   |

### Paper III: Dynamics

|     |   |
|-----|---|
| CO1 | Students will learn about the concept of displacement, speed, velocity, acceleration and its application.   |
| CO2 | Students will study Newton's Law of motion and how to apply these to find the equation of motion of different objects such as simple Pendulum, Compound Pendulum etc. |



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|     |   |
|-----|---|
| CO3 | Students will learn about the simple harmonic motion.   |
| CO4 | Students will be able to understand the concept of projectile and its applications.                   |
| CO5 | Students will learn the concept of work, power and energy, relative motion and momentum and Impulses. |

## Semester V

### Paper I: Analysis-I

|     |   |
|-----|---|
| CO1 | Analysis will introduce concept of Riemann integral.                                    |
| CO2 | Students will be able to check whether the given function is Riemann integrable or not. |
| CO3 | . Students will learn about the countability and uncountability of sets.                |
| CO4 | Students will study the concept of Beta and Gamma functions.                            |
| CO5 | Students will be able to differentiate under an integral sign by using Leibnitz rule.   |

### Paper II: Modern Algebra

|     |   |
|-----|---|
| CO1 | Students will study the algebraic structures Groups and Rings.  |
| CO2 | It will introduce the concept of Groups, Subgroups, Cyclic groups, Cosets, Normal subgroups, Permutation groups and their properties. |
| CO3 | Students will understand the concept of Homomorphism and isomorphism and their applications.  |
| CO4 | It will introduce Rings, Division ring, Integral domain and Polynomial rings.   |
| CO5 | Students will be able to solve problems related to groups and rings.  |





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## Paper III: Probability Theory

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|-----|--|
| CO1 | Students will study the concept of random experiments, Sample spaces, Events of an experiment and how to compute probability of an event |
| CO2 | Students will study the concept of Random variables and its properties.  |
| CO3 | Students will be able to connect the sample space with Real numbers.   |
| CO4 | Students will learn some Discrete Random variables such as Binomial random variables, Poisson Random variable.                           |
| CO5 | Students will learn some Continuous Random variables and its properties  |
| CO6 | Students will study the concept of Bivariate Random variables.   |

## Semester VI

### Paper I: Analysis-II

|     |  |
|-----|--|
| CO1 | Students will study the concept of Double and Triple integral.   |
| CO2 | Students will be able to change of variables in Double and Triple integrals.                                       |
| CO3 | Students will study some important Theorems such as Green's theorem, Gauss divergence theorem and Stokes' theorem. |
| CO4 | Students will learn about the convergence of sequence and series of functions and some theorems related to it.     |
| CO5 | Students will study the concept of Fourier series expansion.   |

### Paper II: Linear Algebra

|     |   |
|-----|---|
| CO1 | Students will study Vector spaces, Linear transformation and their properties in this course.   |
| CO2 | Students will learn about different vector spaces, linear span, linear dependence and independence of vectors, Linear combination of vectors and Basis of a vector space. |
| CO3 | Students will be able to solve problems of linear transformation and Algebra of   |



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|     | linear transformation.   |
| CO4 | Students will be able to find Eigen values and Eigen vectors of a matrix as well as linear transformation.                   |
| CO5 | Students will learn Matrix of a linear transformation and Rank- Nullity theorem and will be able to find minimal polynomial. |

## Paper III: Numerical Analysis

|     |   |
|-----|---|
| CO1 | Students will learn the various methods to obtain the approximate solution of different mathematical equations.   |
| CO2 | Students will learn about the concept of polynomial interpolation by different kinds of method of interpolation such as Newton Forward Difference method, Newton backward difference method, Lagrange method. |
| CO3 | Students will able to learn the concept of numerical differentiation and integration and will be able to solve some problems related to numerical differentiation and integration.                            |
| CO4 | Students will able to learn the various numerical methods for finding the Eigen value of a square matrix.   |