**SRMJEEE 2025 Mathematics Syllabus**

**Unit 1: Sets, Relations, and Functions**

* Sets and their representations, union, intersection, and their algebraic properties.
* Relations, equivalence relations, mappings.
* One-one, into and onto mappings, composition of mappings.

**Unit 2: Complex Numbers and Quadratic Equations**

* Complex numbers in the form a+iba+iba+ib and their representation in a plane.
* Quadratic equations in real and complex number systems and their solutions.
* Relation between roots and coefficients, nature of roots.
* Formation of quadratic equations with given roots, symmetric functions of roots.
* Equations reducible to quadratic equations.

**Unit 3: Matrices, Determinants and their Applications**

* Determinants and matrices of order two and three, minors, cofactors, and applications of determinants in finding the area of a triangle.
* Equality, zero and identity matrix, transpose, symmetric and skew-symmetric matrices.
* Evaluation of determinants, addition and multiplication of matrices.
* Adjoint and inverse of matrices.
* Solution of simultaneous linear equations using determinants and matrices using inverses.

**Unit 4: Combinatorics**

* Permutations and combinations.
* Fundamental principle of counting.
* Permutation as an arrangement without repetitions and constraint repetitions (no circular permutations).
* Combination as selection.
* Problems in P(n,r)P(n,r)P(n,r) and C(n,r)C(n,r)C(n,r), factorial, and simple applications.

**Unit 5: Algebra**

* Theory of equations.
* Relation between the roots and coefficients in an equation.
* Solving equations when two or more roots are connected by a certain relation.
* Equations with real coefficients, occurrence of complex roots in conjugate pairs and its consequences.
* Transformation of equations (Reciprocal Equations).

**Unit 6: Differential Calculus and its Applications**

* Polynomials, rational, trigonometric, logarithmic, and exponential functions.
* Inverse functions, graphs of simple functions, limits, continuity.
* Differentiation of the sum, difference, product, and quotient of two functions.
* Differentiation of trigonometric, inverse trigonometric, logarithmic, exponential, composite, and implicit functions (up to second-order derivatives).
* Applications of Differential Calculus:
	+ Rate of change of quantities, monotonic increasing and decreasing functions.
	+ Maxima and minima of functions of one variable, tangents, and normals.
	+ Rolle’s and Lagrange’s Mean Value Theorems.
	+ Ordinary differential equations, order, and degree.
	+ Formation and solution of differential equations using separation of variables.
	+ Solution of homogeneous and linear differential equations of the type dydx+p(x)y=q(x)\frac{dy}{dx} + p(x)y = q(x)dxdy​+p(x)y=q(x).

**Unit 7: Integral Calculus and its Applications**

* Fundamental integrals involving algebraic, trigonometric, exponential, and logarithmic functions.
* Integration by substitution, integration using trigonometric identities.
* Properties of definite integrals, evaluation of definite integrals (excluding their applications).

**Unit 8: Analytical Geometry**

* **Straight Lines in Two Dimensions**:
	+ Normal form, symmetric form, reduction to various forms, intersection of two straight lines.
	+ Slope of a line, parallel and perpendicular lines, intercepts on coordinate axes.
	+ Family of straight lines (concurrent lines), condition for concurrent lines.
	+ Cartesian coordinates, distance formula, area of a triangle, condition for collinearity, section formula.
	+ Centroid and incentre of a triangle, locus, and its equation.
* **Circles in Two Dimensions**:
	+ Standard form and general form of the equation of a circle, radius, and center.
	+ Parametric form, equation of a circle when endpoints of a diameter are given.
	+ Points of intersection of a line and a circle, condition for a line to be tangent to a circle.
* **Conic Sections in Two Dimensions**:
	+ Sections of cones.
	+ Equations of conic sections (parabola, ellipse, and hyperbola) in standard form.
	+ Problems using their geometrical properties.

**Unit 9: Vector Algebra**

* Vectors and scalars.
* Addition of vectors, components of vectors in two and three dimensions.
* Scalar and vector products, scalar and vector triple products.
* Application of vectors to plane geometry.

**Unit 10: Statistics and Probability Distribution**

* **Statistics**:
	+ Measures of central tendency and dispersion.
	+ Calculation of mean, median, mode for grouped and ungrouped data.
	+ Calculation of standard deviation, variance, and mean deviation for grouped and ungrouped data.
* **Probability**:
	+ Probability of an event, addition and multiplication theorems of probability and their applications.
	+ Conditional probability, Bayes' theorem, probability distribution of a random variable.
	+ Binomial, Poisson, and Normal distributions and their properties.

**Unit 11: Trigonometry**

* Trigonometric ratios, compound angles.
* Solution of triangles, trigonometric identities and equations.
* Inverse trigonometric functions (definition, range, and domain).
* Properties of triangles, including incentre, circumcenter, and orthocenter.
* Solution of triangles.
* Problems related to heights and distances.