Syllabus
Term I (April – September)
Class XI
Subject : Mathematics

Month	Topic / Sub Topic
April	**Sets:** Sets and their representations. Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of the set of real numbers especially intervals (with notations). Union and intersection of sets. Difference of sets. Complement of a set, Properties of Complement sets. Universal set. Venn diagrams.
May	**Relations and Functions:** Ordered pairs, Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the reals with itself (upto $R \times R \times R$). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain and range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs. Sum, difference, product and quotients of functions. **Linear Inequalities:** Linear inequalities, Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Solution of system of linear inequalities in two variables - graphically.
July	**Trigonometric Functions:** Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle. Signs of trigonometric functions and sketch of their graphs. Expressing $\sin(x+y)$ and $\cos(x+y)$ in terms of $\sin x$, $\sin y$, $\cos x$ and $\cos y$. Identities related to $\sin 2x$, $\cos 2x$, $\tan 2x$, $\sin 3x$, $\cos 3x$ and $\tan 3x$.

	General solution of trigonometric equations. Proofs and simple applications of sine and cosine formulae. **Complex Numbers and Quadratic Equations:** Need for complex numbers, inability to solve every quadratic equation. Brief description of algebraic properties of complex numbers. Statement of Fundamental Theorem of Algebra, solution of quadratic equations in the complex number system.
August	**Permutations and Combinations:** Fundamental principle of counting. Factorial *n*. Permutations and combinations derivation of formulae and their connections, simple applications. **Binomial Theorem:** History, statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, general and middle term in binomial expansion, simple applications. **Sequence and Series:** Sequence and Series. Arithmetic Progression (A.P.), Arithmetic Mean (A.M.), Geometric Progression (G.P.), general term of a G.P., sum of *n* terms of a G.P. Arithmetic and geometric series, infinite G.P. and its sum, geometric mean (G.M.). Relation between A.M. and G.M.
September	Revision and Half Yearly Examinations

Syllabus
Term II (October – February)
Class XI
Subject : Mathematics

Month	Topic / Sub Topic
October	**Straight Lines:** Brief recall of 2-D from earlier classes, shifting of origin. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two-point form, intercepts form and normal form. General equation of a line. Equation of family of lines passing through the point of intersection of two lines. Distance of a point from a line. **Introduction to Three-dimensional Geometry:** Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula.
November	**Conic Sections:** Sections of a cone: Circles, ellipse, parabola, hyperbola, a point, a straight line and pair of intersecting lines as a degenerated case of a conic section. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle. **Probability:** Random experiments: outcomes, sample spaces (set representation). Events: Occurrence of events, 'not', 'and' & 'or' events, exhaustive events, mutually exclusive events. Axiomatic (set theoretic) probability, connections with the theories of earlier classes. Probability of an event, probability of 'not', 'and', & 'or' events.

December	. **Limits and Derivatives:** Derivative introduced as rate of change both as that of distance function and geometrically, intuitive idea of limit. Definition of derivative, relate it to slope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions. **Statistics:** Measure of dispersion; mean deviation, variance and standard deviation of ungrouped/grouped data.
January	Additional Material and Revision
February	Revision.