

# MATHEMATICS AND STATISTICS

## SYJC (Arts & Science) PART – I

### Competency STATEMENT

Sr.No.	AREA	Topic	Competency STATEMENT
1.	MATHEMATICAL Logic	MATHEMATICAL Logic	The student will be ABLE to <ul style="list-style-type: none"><li>• Identify STATEMENT in logic AND truth VALUE of it.</li><li>• Combine two or more STATEMENTS</li><li>• Construct the truth TABLE AND EXAMINE LOGICAL EQUIVALENCE of STATEMENT PATTERNS</li><li>• Find DUAL AND NEGATION of STATEMENT PATTERN</li><li>• Study the APPLICATIONS of logic to switching circuits.</li></ul>
2.	MATRICES	MATRICES	<ul style="list-style-type: none"><li>• Identify orders AND types of MATRICES</li><li>• Perform BASIC ALGEBRAIC OPERATIONS on MATRICES.</li><li>• Find the inverse of A MATRIX using ELEMENTARY TRANSFORMATION AND ADJOINT method</li><li>• Solve the system of LINEAR EQUATIONS using MATRICES.</li></ul>
3.	Trigonometric EQUATIONS	Trigonometric EQUATIONS  Solution of A TRIANGLE  Invers trigonometric function	<ul style="list-style-type: none"><li>• UNDERSTAND AND write trigonometric EQUATION</li><li>• Find the PRINCIPAL AND GENERAL solution of A trigonometric EQUATION.</li><li>• Solve TRIANGLE by using sine rule, co-sine rule AND projection rule AND find AREA of A TRIANGLE.</li><li>• UNDERSTAND inverse trigonometric functions with DOMAIN AND RANGE.</li></ul>
4.	PAIR of STRAIGHT lines	PAIR of STRAIGHT lines	<ul style="list-style-type: none"><li>• Write AND interpret the combined EQUATION of two STRAIGHT lines in PLANE.</li><li>• Find the point of intersection of two lines AND CALCULATE the ACUTE ANGLE between them</li><li>• Study the GENERAL second degree EQUATION in <math>x</math> AND <math>y</math> with reference to homogeneous PART of it</li></ul>

5.	Vectors	Vectors	<ul style="list-style-type: none"> <li>• UNDERSTAND SCALARS AND vectors AND ALGEBRA of vectors.</li> <li>• Write vectors of 2 or 3 dimensions, UNDERSTAND the SCALAR AND vector products</li> <li>• Study APPLICATIONS of vectors to AREA of TRIANGLE, work done by A force, moment of A force.</li> <li>• Interpret SCALAR triple product AND its APPLICATIONS.</li> </ul>
6.	Line AND PLANE	Line AND PLANE	<ul style="list-style-type: none"> <li>• Find different forms of EQUATION of line</li> <li>• Find ANGLE between two intersecting PLANES</li> <li>• Find the ANGLE between A line AND A PLANE</li> <li>• Find condition for PERPENDICULARITY AND PARALLELNESS of PLANES</li> <li>• CALCULATE DISTANCE of A point from A PLANE</li> <li>• Find EQUATION of A PLANE in different forms</li> <li>• Find ANGLE between two intersecting PLANES</li> <li>• Find the ANGLE between A line AND A PLANE</li> </ul>
7.	LINEAR PROGRAMMING Problem	LINEAR PROGRAMMING Problem	<ul style="list-style-type: none"> <li>• UNDERSTAND LINEAR EQUATIONS in one AND two VARIABLES.</li> <li>• Find GRAPHICAL solution of LINEAR INEQUATION.</li> <li>• UNDERSTAND MEANING AND FORMULATION of L.P.P.</li> <li>• Find solution of L.P.P. by GRAPHICAL methods.</li> </ul>

**Mathematics and Statistics**  
**SYJC (Arts & Science) (Part II)**  
**Arts and Science**

Sr. No	Area / Topic	Sub Unit	Competency Statement
1.	Differentiation	Differentiation	<p style="text-align: center;">The students will be able to</p> <ul style="list-style-type: none"> <li>• state and use standard formulas of derivative of standard functions</li> <li>• use chain rule of derivatives</li> <li>• find derivatives of the logarithm, implicit, inverse and parametric functions</li> <li>• find second and higher order derivatives.</li> </ul>
2.	Applications of Derivatives	Applications of Derivatives	<ul style="list-style-type: none"> <li>• find equations of tangents and normal to a curve</li> <li>• determine nature of the function-increasing or decreasing</li> <li>• find approximate values of the function</li> <li>• examine function for maximum and minimum values</li> <li>• verify mean value theorems</li> </ul>
3.	Indefinite Integration	Indefinite Integration	<ul style="list-style-type: none"> <li>• understand the relation between derivative and integral</li> <li>• use the method of substitution</li> <li>• solve integrals with the help of integration by parts</li> <li>• solve the integrals by the method of partial fractions</li> </ul>
4.	Definite Integration	Definite Integration	<ul style="list-style-type: none"> <li>• understand integral as a limit of sum</li> <li>• the properties of definite integral</li> <li>• state the properties of definite integral and use them to solve problems</li> </ul>

5.	Application of Definite Integration	Application of Definite Integration	<ul style="list-style-type: none"> <li>find the area under the curve, bounded by the curves using definite integrals.</li> </ul>
6.	Differential Equation	Differential Equation	<ul style="list-style-type: none"> <li>form a differential equation and find its order and degree</li> <li>solve the first order and first degree differential equation by various methods</li> <li>apply the differential equations to study the population, growth and decay in amount of substance and physics.</li> </ul>
7.	Probability Distribution	Probability Distribution	<ul style="list-style-type: none"> <li>understand the random variable and its types.</li> <li>find probability mass function and its probability distribution.</li> <li>find the expected value, variance and the standard deviation</li> <li>find the probability density function of continuous random variable</li> <li>find distribution function of c.r.v.</li> </ul>
8	Binomial Distribution	Binomial Distribution	<ul style="list-style-type: none"> <li>understand random experiment with two or more outcomes.</li> <li>determine probability distribution of random experiment with parameters <math>n</math> and <math>p</math>.</li> <li>find mean, variance, expected value and standard deviation for the binomial distribution.</li> </ul>