BCECE Mathematics Syllabus

Sets and Functions

- Empty set, Finite and Infinite sets
- Equal sets
- Subsets
- Subsets of the set of real numbers, especially intervals (with notations)
- Power set
- Universal set
- Venn diagrams
- Union and Intersection of sets
- Difference of sets
- Complement of a set

Algebra

- Principle of Mathematical Induction
- Complex Numbers and Quadratic Equations
- Linear inequalities
- Matrices
- Determinants
- Permutation and Combination
- Binomial Theorem
- Sequence and Series

Coordinate Geometry

- Straight Lines
- Conic Section
- Introduction to Three-dimensional Geometry

Calculus

- Limits and Derivatives
- Applications of the Integrals
- Integrals
- Applications of the Integrals
- Differential Equations
- Continuity and Differentiability
- Applications of Derivatives
- Integrals

Mathematical Reasoning

- Mathematically acceptable statements.
- Consolidating the understanding of ‘if and only if condition’, ‘and’, ‘our’, ‘implies’, ‘implied by’, ‘there exists’ and their use through a variety of examples related to real life and Mathematics

Statistics and Probability

- Statistics
- Probability

Relations and Functions

- Relations and Functions
- Inverse Trigonometric Functions

Vectors

- Vectors and scalars,
- Magnitude and direction of a vector
- Direction cosines/ratios of vectors
- Types of vectors (equal unit zero parallel and collinear vectors)
- Position vector of a point
- Negative of a vector
- Components of a vector
- The addition of vectors
- Multiplication of a vector by a scalar
- Position vector of a point dividing a line segment in a given ratio
- Scalar product of vectors, projection of a vector on a line
- Product of vectors
- Three-Dimensional Geometry
- Direction cosines/ratios of a line joining two points
- Cartesian and vector equation of a line
- Coplanar and skew lines
- The shortest distance between two lines
- Cartesian and vector equation of a plane
- The angle between two lines, two planes, and a line & a plane
- A distance of a point from a plane

Linear Programming

- Constraints
- Objective function
- Optimization
- Different types of linear programming (L.P.) problems
- The Mathematical formulation of L.P. problems
- Graphical method of solution for problems in two variables
- Feasible and infeasible regions
- Feasible and infeasible solutions
- Optimal feasible solutions (up to three non-trivial constraints)

Probability

- Multiplication theorem on probability
- Conditional probability
- Independent events
- Total probability
- Baye’s theorem
- Random variable and its probability distribution
- Mean and variance of haphazard variables
- Repeated independent (Bernoulli) trials and Binomial distribution