# ST GEORGE'S COLLEGE

# DEPARTMENT OF MATHEMATICS

# FOURTH FORM SYLLABUS - 2015-2016

**CHRISTMAS TERM**

1. Laws of Indices
    - Indices, Equations eg $X^n = X^y$ then n = y
2. Change the subject of the formula
    - Substitution in the formula
3. Factorization of Quadratic Expressions
    - Perfect squares
    - Difference of two squares
    - Of the form $ax^2 + bx + c$
4. Solution of quadratic equations by :
    - Factorization
    - Quadratic formula
    - Completing the square
5. Applications involving word problems
6. Algebraic fractions
    - Addition and Subtraction
    - Multiplication and Division
7. Binary Operations

**SETS**

- Revision of Set theory
- Two sets Venn diagrams

- Applications

**CONSUMER ARITHMETIC**

- Bills and Hire purchase
- Payment by hour, overtime, commission, discount
- Simple Interest, Compound Interest

**MATRICES**

1. Concept of Matrices
    - Formation of Matrices
    - Types of Matrices
    - Order of Matrices
    - Addition and Subtraction of Matrices
    - Singular matrices
    - Determinant and adjoint of a matrix
    - Inverse of a matrix
    - Applications – simultaneous equations

**EASTER TERM**

**RELATIONS AND FUNCTIONS**

1. Define Relation & Mapping
2. Functional notations
3. Simple functions
4. Inverse of simple functions
5. Composite functions
6. Inverse of composite functions
7. Applications

**TRIGONOMETRY**

1. Review: Pythagoras' Theorem
2. Review: Trigonometrical Ratios
3. Review: Angle of elevation and depression
4. Sine and Cosine rule
5. Area of triangle using the formula A = ½ absinC
6. Applications

**GRAPHS**

1. INEQUALITIES
    - Review of finding solution set
    - Represent solution set on a number line and on the Cartesian plane
2. QUADRATIC FUNCTIONS
    - Draw graphs of quadratic functions of the form $y = ax^2 + bx + c$
    - Identify quadratic functions with maximum or minimum turning point
    - Roots of the quadratic function
    - Maximum and Minimum value of quadratic functions and the x – values/coordinates where the maximum or minimum value occurs
    - Roots of quadratic function, f(x) = A is a numerical value
    - Range of values on a map for a given section on the graph

**SUMMER TERM**

STATISTICS

1. Definition of concepts eg. data, raw data, discrete data, frequency etc.
2. Frequency Distribution Table :
    - Ungrouped data
    - Grouped data
3. Measures of Central tendency

- Mean, Mode and Median

4. Histogram
5. Frequency polygon

COORDINATE GEOMETRY

- Length of line between two points
- Gradient of a line
- Midpoint of a line
- Equation of a straight line
- Parallel and perpendicular lines

CONSTRUCTIONS

1. Construction and bisection of angles
2. Construction of a perpendicular line to a given line at a point on the line
3. Construction of a Perpendicular line to a given line from a point outside the line
4. Construction of triangles and quadrilaterals

TRANSFORMATION

1. Rotation - key ideas: *centre of rotation; angle of rotation; direction of rotation*
- *congruence of shapes*

b) the rotation image of a given figure;
c) the centre, angle and direction of rotation when given a figure and its image under; rotation
d) use of symbol, $R_\theta$, to denote rotation through $\boldsymbol{\theta}$;
e) *rotational symmetry about a point ; order of rotational symmetry* of a given figure;
f) description and production of images which result from:
- successive reflections, translations or rotations;
- combinations of any two of the transformations: M, T, $R_\theta$ ;
- **a glide reflection** (G) : M followed by T or vice versa denoted by the symbols, TM, or MT