Mathematical Studies – Standard Level

Mathematical Studies SL is designed to provide a realistic option for students with varied backgrounds and abilities who are not likely to require mathematics beyond the Diploma Program. Students develop the skills needed to cope with mathematical demands of a technological society; they also apply mathematics to real life situations. A substantial piece of personal research, in the form of a project, is a requirement of the course.

The aim of the course is to enable students to appreciate the multiplicity of cultural and historical perspectives of mathematics and to develop an enjoyment and appreciation of the richness the subject offers. Students will be given the opportunity to develop logical, critical and creative thinking skills as well strategies for problem solving whilst at the same time appreciate technological developments and their uses in society, transferring these skills to alternative situations in the future. All students are expected to own a Texas Instruments TI-83, TI-84 or TI-84+ graphing calculator, which will be used extensively throughout the course.

Subject Areas

1. **Introduction to the graphic display calculator –** numerical, graphical and listing facilities of the graphics display calculator
2. **Number and algebra –** number sets, approximations, scientific notation, measurement, sequences, series, linear equations, quadratic equations
3. **Sets, logic and probability –** set theory, Venn diagrams, probability
4. **Functions –** properties of a function, linear, quadratic, exponential, trigonometric functions and the use of the graphing calculator to solve problems
5. **Geometry and Trigonometry** – coordinate geometry, sine rule, cosine rule, area of a triangle, 3D geometry
6. **Statistics** – analysis and interpretation of numerical data in terms of sample and population, measures of spread, graphs, cumulative frequency, standard deviation, line of best fit, regression line, independence tests
7. **Introductory differential calculus** – gradient of a line, tangent to a curve, derivatives, increasing and decreasing functions, local maximum and minimum points
8. **Financial mathematics** – financial transactions, simple interest, compound interest, investments, depreciation, loans

Assessment Outline

1. Internal	**Project**	The Project is an individual piece of work involving the collection of information or the generation of measurements, and the analysis and evaluation of the information or measurements. The Project should not normally exceed 2000 words, although it is the quality of the mathematics and the processes used and described that is important, rather than the number of words written.	20%

The purpose of the Project is to develop students' personal insight into the nature of mathematics and to develop their ability to ask their own questions about mathematics. It should enable students to see connections and applications of mathematics to other areas of interest. The Project is internally assessed by the teacher and externally moderated by the IBO.

2. External	**Paper 1**	1 hr 30min – 15 compulsory short response questions based on the whole syllabus	40%
	Paper 2	1 hr 30min – 5 compulsory extended response questions based on the whole syllabus	40%