Head of Department: MFO
Key-stage co-ordinators: DKI, OPE
Teachers: DGA, HRI, ATU

Subject: Mathematical Studies
Exam Board: AQA Level 3 Certificate Mathematical Studies (1350B)

Overview:
Throughout the term students will be developing and improving their understanding of Statistics, Estimation and Financial Literacy from GCSE and starting to be analytical when looking at Data.

Autumn Term

Outline of Key Learning	Specification Code
Analysis of Data a. Identify and know the difference between: qualitative and quantitative data, primary and secondary data, discrete and continuous quantitative data b. Infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling c. Calculate/identify mean, median, mode, quartiles, percentiles, range, interquartile range, standard deviation d. Interpret these numerical measures and reaching conclusions based on these measures	D1 D2 D3
Numerical Calculations a. Substitute numerical values into formulae, spreadsheets and financial expressions b. Apply and interpret limits of accuracy c. Find approximate solutions to problems in financial contexts d. Interpret percentages and percentage changes as a fraction or a decimal e. Express one quantity as a percentage of another f. Compare two quantities using percentages g. Solve problems involving percentage change	F1 F2

Fermi Estimation a. Make fast, rough estimates of quantities which are either difficult or impossible to measure directly	E2
Representing Data Diagrammatically a. Construct and interpret diagrams for grouped discrete data and continuous data, and reach conclusions based on these diagrams. b. Construct and interpret histograms with equal and unequal class intervals, cumulative frequency graphs, box and whisker plots, stem-and-leaf diagrams	D4
Math's for Personal Finance a. Simple and compound interest Annual Equivalent Rate (AER) b. Savings and investments c. Student loans and mortgages Annual Percentage Rate (APR) d. Look at graphical representation in financial contexts and interpret results e. Income tax, National Insurance, Value Added Tax (VAT) f. Understand effect of inflation Retail Price Index (RPI), Consumer Price Index (CPI) g. Set up, solve and interpret the solutions to financial problems, including those that involve compound interest using iterative methods h. Currency exchange rates including commission i. Budgeting	F3 F4 F5 F6 F7
Modelling Cycle a. Representing a situation mathematically, making assumptions and simplifications b. Selecting and using appropriate mathematical techniques for problems and situations c. Interpreting results in the context of a given problem d. Evaluating methods and solutions including how they may have been affected by assumptions made	E1

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Spring Term

During the Spring term students will begin to be critical of data and draw conclusions giving reasons and evidence to support this. Students will also look closely at the optional module; Critical Path analysis.
The pre-release material is available in the second half of the spring term and potential questions are discussed and practiced drawing upon the skills learnt throughout the course.

Outline of Key Learning	Specification Code
Presenting logical and reasoned answers and communicating effectively a. Criticise the arguments of others b. Summarise and write reports c. Compare results from a model with real data d. Critical analysis of data quoted in media, political campaigns, marketing etc	C1 C2 C3
Critical Path Analysis a. represent compound projects by activity networks b. Use early time and late time algorithms to identify critical activities and find the critical path(s) c. Use Gantt charts (cascade diagrams) to present project activities d. Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes e. Understand and apply Venn diagrams and simple tree diagrams f. Calculate the probability of combined events g. Calculate the expected value of quantities such as financial loss or gain h. Understand that the actions that can be taken to reduce or prevent specific risks may have their own costs including the costs and benefits of insurance	R1-R10

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Summer Term	
The examination for this 1 year course is early May. Students complete paper 1 on the compulsory topics which have been taught in Autumn term. Paper 2 is based on the Pre-release material with specific questions based on the Optional module the students have been studying.	
Outline of Key Learning	**Specification Code**
Applying prior knowledge to the pre-release material. a. Revisit prior knowledge and apply to exam questions. b. Reflect on prior knowledge and apply to pre-release material.	ALL