Subject: A-Level Mathematics Year 1
Exam Board: Pearson Edexcel Level 3 Advanced Subsidiary GCE in Mathematics (8MA0)

Overview:	
Throughout the term students will be developing and improving their understanding of Algebra, Coordinate Geometry and Trigonometry from GCSE as well as being introduced to Calculus & Mechanics.	

Autumn Term	
Outline of Key Learning	**Unit Code**
Algebra and Functions a. Algebraic manipulation, surds and indices b. Solving quadratics and using the discriminant c. Solving simultaneous equations – one linear and one quadratic d. Solving inequalities – linear, quadratic and showing it graphically e. Sketch functions f. Transforming functions	**1a, b, c, d, e ,f**
Differentiation a. Differentiate polynomials b. Find: gradient at a point, minimum and maximum points, equations of tangents and normal	**6a, b**
Co-ordinate Geometry a. Find equations given 2 points, find length of lines, calculate area given equations b. Equations of circles and geometric problems	**2a, b**
Algebra a. Divide polynomials, factor theorem and proof b. Binomial expansion	**3a, b**

Trigonometry
 	
  a. Understand and use trigonometric ratios and graphs
  b. Trigonometric identities and solving equations
	4a, b

Vectors
 	
  a. Find magnitude, add and subtract vectors, scalar multiplication
  b. Geometric problems with vectors
	5a, b

Mechanics
 	
  a. Mathematical modelling and standard S.I units of length, time and mass]
  b. Definitions of force, velocity, speed, acceleration, and weight and displacement and linking to vectors
	6a, b of Mechanics

Kinematics
 	
  a. Graphical representations of velocity, acceleration and displacement
  b. Apply and use SUVAT formula
	7a, b of Mechanics

Overview:
Throughout the Spring term students will extend their knowledge of Statistics and apply Calculus and apply to Kinematic problems within Mechanics.

Spring Term	
Outline of Key Learning	**Unit Code**
Statistical Sampling a. Advantages and disadvantages of sampling methods b. Understand and use sampling techniques and make comparisons	**1a, b of Statistics**
Data presentation and Interpretation a. Calculation and interpretation of measures of location and variation. Use coding b. Interpret diagrams for single-variable data, interpret scatter graphs and recognise outliers	**2a, b of Statistics**
Probability a. Mutually exclusive events b. Independent events	**3 of Statistics**
Statistical Distributions a. Use discrete distributions to model real-world problems and calculate probabilities using binomial distribution	**4 of Statistics**
Integration a. Understand and integrate indefinite integrals x^n b. Definite integrals and find areas under curves	**7a, b**
Exponentials and Logarithms a. Calculate and use exponential functions and natural logarithms	**8**

Teach for Understanding

Forces and Newton's Laws	**8 of Mechanics**
a. Use and apply Newton's first law, use force diagrams, equilibrium and units **i, j** b. Use and apply Newton's second and third law and link to particles and pulleys	
Kinematics 2	**9 of Mechanics**
a. Use and apply calculus to determine rates of change for kinematics b. Use integration for kinematic problems	
Statistical Hypothesis Testing	**5 of Statistics**
a. Understanding hypothesis testing and significance levels b. Carry out hypothesis tests involving the binomial distribution	

Overview:
Students are entered in for the AS qualification, which is in May. Students will be re-visiting topics and applying to past papers

Summer Term	
Outline of Key Learning	**Specification Code**
Exam preparation a. Revisit prior knowledge and apply to exam questions. b. Improve exam technique and problem solving questions	**ALL**

A variety of different resources are available to students to assist independent learning.
These include:

- Edexcel A Level Mathematics Textbook
- Student Logins for Integral Mathematics
- Student Logins for Dr Frost Mathematics
- Exam Solutions https://www.examsolutions.net/a-level-maths/ and Maths Genie https://www.mathsgenie.co.uk/alevel.html provide a useful bank of Exam Style questions
- Revision Guides and Workbooks
- Specification link and further resources:
  https://qualifications.pearson.com/en/qualifications/edexcel-a-levels/mathematics-2017.html#%2Ftab-ASMathematics
  *Be aware that you will need to click on AS Mathematics on the drop down menu.