**Curriculum Overview – AS Mathematics Statistics and Mechanics**

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|  | **Autumn** | | | **Spring** | | | | **Summer** | |
|  | **Autumn 1** | **Autumn 2** | **Spring 1** | | **Spring 2** | **Summer 1** | **Summer 2** | |
| **Topic** | Team teaching Pure | Stats: Unit 1&2  Chapters 1,2,3,4  Mech: Units 6&7  Chapters 8,9 | Stats: Unit 3&4  Chapters 5&6  Mech: Unit 8  Chapter 10 | | Stats: Uni 5  Chapter 7  Mech: Unit 9  Chapter 11 | Revision | End of year assessment | |
| **Critical Prior Knowledge** |  | [Page 0 – Statistics and Mechanics Year 1-AS - ActiveTeach (activeteachonline.com)](https://www.activeteachonline.com/product/view/id/856/page/0/mode/dps)  [Page 20 – Statistics and Mechanics Year 1-AS - ActiveTeach (activeteachonline.com)](https://www.activeteachonline.com/product/view/id/856/page/20/mode/dps)  [Page 40 – Statistics and Mechanics Year 1-AS - ActiveTeach (activeteachonline.com)](https://www.activeteachonline.com/product/view/id/856/page/40/mode/dps)  [Page 58 – Statistics and Mechanics Year 1-AS - ActiveTeach (activeteachonline.com)](https://www.activeteachonline.com/product/view/id/856/page/58/mode/dps)  [Page 118 – Statistics and Mechanics Year 1-AS - ActiveTeach (activeteachonline.com)](https://www.activeteachonline.com/product/view/id/856/page/118/mode/dps)  [Page 130 – Statistics and Mechanics Year 1-AS - ActiveTeach (activeteachonline.com)](https://www.activeteachonline.com/product/view/id/856/page/130/mode/dps) | Prerequisite: Mech AS Unit 6, Pure AS Unit 5  [Page 68 – Statistics and Mechanics Year 1-AS - ActiveTeach (activeteachonline.com)](https://www.activeteachonline.com/product/view/id/856/page/68/mode/dps)  [Page 82 – Statistics and Mechanics Year 1-AS - ActiveTeach (activeteachonline.com)](https://www.activeteachonline.com/product/view/id/856/page/82/mode/dps)  [Page 156 – Statistics and Mechanics Year 1-AS - ActiveTeach (activeteachonline.com)](https://www.activeteachonline.com/product/view/id/856/page/156/mode/dps) | | Prerequisite: AS Pure Unit 6,7  [Page 98 – Statistics and Mechanics Year 1-AS - ActiveTeach (activeteachonline.com)](https://www.activeteachonline.com/product/view/id/856/page/98/mode/dps)  [Page 180 – Statistics and Mechanics Year 1-AS - ActiveTeach (activeteachonline.com)](https://www.activeteachonline.com/product/view/id/856/page/180/mode/dps) |  |  | |
| **Overall Intent**  **(Big ideas and key concepts)** |  | Population and samples  Sampling  Types of data  The large data set  Measures of central tendency  Measures of spread  Variance and standard deviation  Coding  Outliers  Box plots  Cumulative frequency  Histograms  Comparing data  Correlation  Linear regression  Constructing a mechanics model  Modelling assumptions  Quantities and units  Working with vectors  Displacement-time graphs  Velocity-time graphs  Constant acceleration formulae  Vertical motion under gravity | Calculating probabilities  Venn diagrams  Mutally exclusive and independent events  Tree diagrams  Probability distributions  The binomial distribution  Cumulative probabilities  Force diagrams  Forces as vectors  Forces and acceleration  Motion in 2D  Connected particles  Pulleys | | Hypothesis testing  Finding critical values  One and two tailed tests  Functions of time  Using differentiation  Maxima and minima problems  Using integration  Constant acceleration formulae |  |  | |
| **Essential**  **Knowledge milestones**  **(What students must master)** |  | Understand population, sample and census  Understand the advantages and disadvantages of different types of sampling  Define data  Understand the large data set and how to collect data from it  Calculate measures of central tendency, measures of location, measures of spread  Understand and use coding  Identify outliers  Draw and interpret box plots, cumulative frequency diagrams, histograms  Compare two data sets  Draw and interpret scatter plots  Interpret correlation  Understand and use the regression line  Understand how a model applies to mechanics  Understand and apply some of the common assumptions  Know SI units  Know the difference between scalar and vector quantities  Displacement-time graphs  Velocity-time graphs  The constant acceleration formulae | Calculate probabilities for single events  Draw and interpret Venn diagrams  Understand mutually exclusive and independent events  Understand and use tree diagrams  Understand and use simple discrete probability distributions  Understand and use the binomial distribution and calculate individual and cumulative probabilities  Draw force diagrams and calculate resultant forces  Understand and use Newton’s first law, second law and third law  Solve problems involving connected particles | | Understand the language and concept of hypothesis testing  Find critical values of a binomial distribution  Carry out a one tail and a two tail tests for the proportion of the binomial distribution  Understand that displacement, velocity and acceleration may be given as functions of time  Use differentiation to solve kinematics problems  Use calculus to solve problems and to derive constant acceleration formulae |  |  | |
| **Cultural Capital** |  |  |  | |  |  |  | |
| **Mode of Retrieval** |  | Retrieval practise:  Start of each lesson  1 question from this topic  1 question from a previous topic | Retrieval practise:  Start of each lesson  1 question from this topic  1 question from a previous topic | | Retrieval practise:  Start of each lesson  1 question from this topic  1 question from a previous topic |  |  | |
| **ECC Student Characteristics** | Knowledgeable  Deeply understand and recall information  Skill in applying knowledge | Knowledgeable  Deeply understand and recall information  Skill in applying knowledge | Knowledgeable  Deeply understand and recall information  Skill in applying knowledge | | Knowledgeable  Deeply understand and recall information  Skill in applying knowledge | Knowledgeable  Deeply understand and recall information  Skill in applying knowledge | Knowledgeable  Deeply understand and recall information  Skill in applying knowledge | |
| **Connection to future learning**  **(When is this developed / revisited)?** |  | AS Mech Unit 9  A2 Stats Unit 1  A2 Mechanics Units 6,7,8 | AS Stats Unit 5  A2 Stats Unit 2,3  A2 Mech Units 4,6,7,8 | | A2 Stats Unit 3 |  |  | |