**A Level Further Maths, Further Statistics 1**

**Exam Board: Edexcel**

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| **Term** | **INTENT** | **IMPLEMENTATION** | **IMPACT** |
| **Substantive Knowledge**  This is the specific, factual content for the topic, which should be connected into a careful sequence of learning. | **Disciplinary Knowledge (Skills)**  This is the action taken within a particular topic in order to gain substantive knowledge. | **Assessment opportunities**  What assessments will be used to measure student progress?  Evidence of how well students have learned the intended content. |
| **Autumn Term**  **1A**  **Year 13** | Core Pure 2 content | See Curriculum Map for Yr 13 Further Maths |  |
| **Autumn Term**  **1B**  **Year 13** | Core Pure 2 content | See Curriculum Map for Yr 13 Further Maths |  |
| **Spring Term**  **2A**  **Year 13** | Further Statistics 1  Chapter 1: Discrete Random Variables   * + 1.1 Expected Value of a Discrete Random Variable   + 1.2 Variance of a Discrete Random Variable   + 1.3 Expected Value and Variance of a Function of X   + 1.4 Solving Problems Involving Random Variables   Chapter 2: Poisson Distributions   * 2.1 The Poisson Distribution * 2.2 Modelling with the Poisson Distribution * 2.3 Adding Poisson Distributions * 2.4 Mean and Variance of a Poisson Distribution * 2.5 Mean and Variance of the Binomial Distribution * 2.6 Using the Poisson Distribution to Approximate the Binomial Distribution   Chapter 3: Geometric and Negative Binomial Distributions   * 3.1 The Geometric Distribution * 3.2 Mean and Variance of a Geometric Distribution * 3.3 The Negative Binomial Distribution * 3.4 Mean and Variance of the Negative Binomial Distribution   Chapter 4: Hypothesis Testing   * 4.1 Testing for the Mean of a Poisson Distribution * 4.2 Finding Critical Regions for a Poisson Distribution * 4.3 Hypothesis Testing for the parameter p of a Geometric Distribution * 4.4 Finding Critical Regions for a Geometric Distribution | Chapter 1: Discrete Random Variables  • Find the expected value of a discrete random variable X  • Find the expected value of X2  • Find the variance of a discrete random variable  • Use the expected value and variance of a function of X  • Solve problems involving random variables  Chapter 2: Poisson Distributions  • Use the Poisson distribution to model real-world situations  • Use the additive property of the Poisson distribution  • Understand and use the mean and variance of the Poisson distribution  • Understand and use the mean and variance of the binomial distribution  • Use the Poisson distribution as an approximation of the binomial distribution  Chapter 3: Geometric and Negative Binomial Distributions   * Understand and use the geometric distribution * Calculate and use the mean and variance of the geometric distribution * Understand and use the negative binomial distribution * Calculate and use the mean and variance of the negative binomial distribution   Chapter 4: Hypothesis Testing   * Use hypothesis tests to test for the mean λ of a Poisson distribution * Find critical regions of a Poisson distribution using tables * Use hypothesis tests to test for the parameter p in a geometric distribution * Find critical regions of a geometric distribution | * In class teacher assessment through Q&A * End of chapter mini test (with peer marking) * Chapter revision exercise via textbook * End of term review exercises via textbook * End of term formal mixed chapter assessment |
| **Spring Term**  **2B**  **Year 13** | Chapter 5: Central Limit Theorem   * 5.1 The Central Limit Theorem * 5.2 Applying the Central Limit Theorem to Other Distributions   Chapter 6: Chi-Squared Tests   * 6.1 Goodness of Fit * 6.2 Degrees of Freedom and the Chi-Squared Family of Distributions * 6.3 Testing a Hypothesis * 6.4 Testing the Goodness of Fit with Discrete Data * 6.5 Using Contingency Tables * 6.6 Apply Goodness of Fit Tests to Geometric Distributions   Chapter 7: Probability Generating Functions   * 7.1 Probability Generating Functions * 7.2 Probability Generating Functions of Standard Distributions * 7.3 Mean and Variance of a Distribution * 7.4 Sums of Independent Random Variables   Chapter 8: Quality of Tests   * 8.1 Type I and Type II errors * 8.2 Finding Type I and Type II errors Using the Normal Distribution * 8.3 Calculate the Size and Power of a Test * 8.4 The Power Function | Chapter 5: Central Limit Theorem   * Understand and use the central limit theorem to approximate the sample mean of a random variable * Apply the central limit theorem to other distributions   Chapter 6: Chi-Squared Tests   * Form hypotheses about how well a distribution fits as a model for an observed frequency distribution and measure the goodness of fit of a model to observed data * Understand degrees of freedom and use the chi-squared χ2 family of distributions * Be able to test a hypothesis * Apply the goodness-of-fit tests to discrete data * Use contingency tables * Apply the goodness-of-fit tests to geometric distributions   Chapter 7: Probability Generating Functions   * Understand the use if probability generating functions * Use probability generating functions for standard distributions * Use probability generating functions to find the mean and variance of a distribution * Know the probability generating function of the sum of independent random variables   Chapter 8: Quality of Tests   * Know about Type I and Type II errors * Find Type I and Type II errors using the normal distribution * Calculate the size and power of a test * Draw a graph of the power function for a test | * In class teacher assessment through Q&A * End of chapter mini test (with peer marking) * Chapter revision exercise via textbook * End of term review exercises via textbook * End of term formal mixed chapter assessment |
| **Summer Term**  **3A**  **Year 13** | Revision and Exams | Exam Technique and Exam Questions |  |
| **Summer Term**  **3B**  **Year 13** | Exams |  |  |