**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 1Chapter 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 variablesChapter 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 distributionChapter 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
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| **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 $\overbar{X}$
* 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
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| **Summer Term****3A****Year 13** | Revision and Exams | Exam Technique and Exam Questions |  |
| **Summer Term****3B****Year 13** | Exams |  |  |