

Immanuel Lutheran College

S.7 Mathematics & Statistics Course Outline (2010 – 2011)

Textbook: New Way Mathematics & Statistics for HKASL (2nd Edition), Chow Wai-keung, Li Kam-yuk, Manhattan

Teacher(s): Ho KC

Reference Book: A Concise Course in Maths & Stat. For HKASLE, C. S. Lee, Learner's Series

Chapter 12 – Probability

Date	Objectives	Periods	Contents	Relevant Ex. / Tests
2/9 to 17/9	<ol style="list-style-type: none"> Students should have some ideas about set notations and be able to describe a set of objects and its subsets. Represent a set by various methods including Venn diagrams. Students should have some ideas about sample space, event and be able to apply set operations to events. Students should be able to define mutually exclusive events Understanding Classical Definition of probability, Relative Frequency and the fundamental properties of probability. Applying multiplication principle, permutation and combination methods for counting in finding probability. 	2 1 2 3	<p>Set notation</p> <p>Sample space and events</p> <p>Probability</p> <p>Methods of counting</p>	<p>Exercise 12.1</p> <p>Exercise 12.2</p> <p>Exercise 12.3</p> <p>Exercise 12.4</p>
	Total:	8		

Chapter 13 – Probabilities of Compound

Date	Objectives	Periods	Contents	Relevant Ex. / Tests
20/9 to 30/9	<ol style="list-style-type: none"> State the addition rules and apply them to find probabilities. Definition and calculate conditional probabilities. State the multiplication rules and apply them to find probabilities. Bayes' theorem 	2 2 2	<p>Addition rule</p> <p>Conditional probabilities</p> <p>The Multiplication rule</p> <p>Independent events and the special multiplication rule</p> <p>Bayes' Theorem</p>	<p>Exercise 13.1</p> <p>Exercise 13.2</p> <p>Exercise 13.3</p> <p>Exercise 13.4</p> <p>Exercise 13.5</p>
	Total:	1	Chapter 11-13	Test 1

Chapter 14 – Discrete Probability Distribution

Date	Objectives	Periods	Contents	Relevant Ex. / Tests
4/10 to 18/10	1.Understanding the meaning of random variable and state its basic characteristics. 2.Understanding the meaning of a discrete probability distribution and represent it by a mathematical function. 3.Explain the meaning of a probability function 4.Define the expectation of a discrete random variable and solve simple problems involving expected values. 5.Interpret the variance and the standard deviation of a random variable.	2 2 2 2	Random variables Probability Distributions and Probability Function Expectation Variance and Standard Deviation	Exercise 14.1 Exercise 14.2 Exercise 14.3 Exercise 14.4
	Total:	8	Chapter 11-14	First Term UT

Chapter 15 – Some Special Discrete Distributions

Date	Objectives	Periods	Contents	Relevant Ex. / Tests
19/10 to 9/11	1. Definition of some special probability distributions and be able to solve some problems involving the distributions a. Bernoulli distribution b. Binomial distribution c. Geometric distribution d. Poisson distribution	2 1 2 2 2	The Bernoulli Distribution The Binomial Distribution The Geometric Distribution The Poisson Distribution	Exercise 15.1 Supp. Exercise Exercise 15.2 Exercise 15.3 Exercise 15.4
	Revision	1		Supp. Exercise
	Total:	10	Chapter 14-15	Test 2

Chapter 16 – The Normal Distribution and Its Applications

Date	Objectives	Periods	Contents	Relevant Ex. / Tests
10/11 to 25/11	1.To understand the meaning of continuous probability distribution, probability density function (pdf) 2.Calculate probabilities of a continuous probability distribution as areas under the pdf curve 3.Define the mean and the variance of a continuous random variable and state some of their simple properties 4.Define the normal distribution 5.Solve problems involving applications of normal distributions 6.Use appropriate normal distributions to approximate binomial distributions	2 1 2 2 2	Continuous probability distributions Basic knowledge of a continuous probability distribution The Normal distribution Application of the normal distribution Normal approximation to the Binomial	Exercise 16.1 Exercise 16.3 Exercise 16.4 Exercise 16.5
	Total:	9	Chapter 16	Test 3

Chapter 17 – Population Parameters and Sample Statistics

Date	Objectives	Periods	Contents	Relevant Ex. / Tests
29/11 to 6/12	1.State the purpose of studying a sample 2.Explain the meaning of the sampling distribution of a statistic and construct sampling distributions for the mean and the variance in simple cases 3.Recognize that for a large random sample, the mean is a good estimate of the population mean and the variance is a good estimate of the population variance	1 2 2	Random Samples and Sampling Distributions Relationship between Sample Mean and Population mean Relationship between Sample Variances and Population variance	Exercise 17.1 Exercise 17.2 Exercise 17.3
	Total:	5		

Chapter 18 – Comparison of Empirical Frequency Distributions with Fitted Distributions

Date	Objectives	Periods	Contents	Relevant Ex. / Tests
7/12 to 17/12	1. Follow the general procedure for fitting a theoretical distribution to an empirical frequency distribution 2. Examine the discrepancies between the fitted and the observed class frequencies and draw reasonable conclusions regarding the goodness of fit 3. Apply the general procedure and examination of discrepancies above to the fitting of the distribution models to empirical frequency distributions with the model parameters either given or estimated from the given data.	2	Fitting a Discrete Uniform Distribution	Exercise 18.2
		2	Fitting a Poisson Distribution	Exercise 18.3
		2	Fitting a Binomial Distribution	Exercise 18.4
		1	Fitting a Normal Distribution	Exercise 18.5
	Total:	7		

Revision –

Date	Objectives	Periods	Contents	Relevant Ex. / Tests
3/1 to 25/1	Revision	10		Supp. Exercises Test 4 Mock Exam