

**The Chinese University of Hong Kong
Faculty of Science
Science Academy for Young Talent**

Summer Courses 2014
Course Outline

CUSA1006 Introduction to Probability and its applications in Statistics
概率論導論及其在統計學中的應用

Introduction:

The primary goal of this course is to introduce basic concepts of probability. Several popular probability distribution models and their applications will be discussed. Students will learn more about probability and its use in solving real-world problems.

本課程的主要目的是介紹概率論的基本概念，並討論一些常用的概率分佈模型及其應用。學生可以學到更多概率論的知識及如何用它解決現實問題。

Medium of Instruction: Cantonese

Teacher:

Professor SH Cheung
Department of Statistics, CUHK
Room 117, Lady Shaw Building, CUHK
Tel: 3943 7928, E-mail: shcheung@cuhk.edu.hk

Course Content:

25 July 2014 (Friday)	<u>Lecture:</u> <ul style="list-style-type: none">• Principle of Counting• Permutations• Combinations• Axioms of Probability• Equally Likely Outcomes• Independent events• Conditional Probabilities• The Bayes' Formula <u>Assessment:</u> 30 minutes quiz <u>Discussion:</u> The Birthday Problem, The Monty Hall Problem
28 July 2014 (Monday)	<u>Lecture:</u> <ul style="list-style-type: none">• Binomial Distribution<ul style="list-style-type: none">○ Computation of Binomial Probabilities○ Expectation and Variance○ Applications<ul style="list-style-type: none">▪ In Quality Control: OC Curve▪ In Marketing Survey: estimation of proportions• Hypergeometric<ul style="list-style-type: none">○ The basic idea and the evaluation of probabilities○ Application in Ecology (capture/recapture method used to estimate population size) <u>Project:</u> <ul style="list-style-type: none">• Use excel to compute and draw OC curves (in stat. computer lab) <u>Assessment:</u> <ul style="list-style-type: none">• Project output, 30 minutes quiz
29 July 2014 (Tuesday)	<u>Lecture:</u> <ul style="list-style-type: none">• Normal distribution<ul style="list-style-type: none">○ Probabilities and the use of normal table○ Central limit theorem (a very brief introduction)○ Confidence interval○ Computation of sample size○ Applications <u>Project:</u> <ul style="list-style-type: none">• Group work on project: estimation of blood pressure of high-school students. <u>Assessment:</u> <ul style="list-style-type: none">• Presentation of project findings
30 July 2014* (Wednesday)	Make up class

Duration	2½ days (total 15 contact hours)
Date	25, 28, 29 July 2014 30 July 2014* (make up class)
Time	25, 28 July 2014: 9:30 am – 12:30 pm; 2:00 pm – 5:00 pm 29 July 2014: 9:30 am – 12:30 pm 30 July 2014*: 9:30 am – 12:30 pm; 2:00 pm – 5:00 pm (make up class)
Venue	The Chinese University of Hong Kong
Enrollment	35
Expected applicants	S5 – S6 students
Tuition Fee	HKD 2,200.00
Credit	1 Academy Unit Certificates or letters of completion will be awarded to students upon completion.

* These dates are reserved for make up classes in case there is any cancellation of classes due to bad weather or other factors.