數學系課程核心教材內容

課程名稱：(中文) 隨機過程 (英文) Stochastic Processes						開課單位	統科碩士班
						課程代碼	2315703
授課教師	林培生	學分數	3	必/選修	選修	開課年級	一

教學目標： In this course, I would like to introduce some familiar examples of processes modeled as stochastic time series include market and exchange rate fluctuation, signal such as speech and video, medical data such as a patient's blood pressure, and random movement such as Brownian motion or random walks.

課程概述：A stochastic process amounts to a sequence of random variables known as a time series. Another basic type of a stochastic process is a random field, whose domain is a region of space. We will treat stochastic processes as functions of one or several deterministic arguments and non-deterministic quantities which have certain probability distributions.

先修科目或先備能力：機率論

建議參考書目	Hoel, P.G, Port, S.C. and Stone, C.J. Introduction to Stochastic Processes. Houghton Mifflin Company.

課程大綱

單元主題	內容綱要	上課週數
Markov chains	Transition probabilities, examples of Markov chains, stationary distribution	4
Birth and death process	Derivation and application for birth and death chains	4
Reversible chains	Definition of recurrent states, decomposition of state spaces, Limiting distribution of a Markov chain	4
Counting processes	Markov pure jump processes, introduction of Poisson processes	2
Branching processes	Definition of branching processes, discussion of the properties for extinction.	2