City University of Hong Kong
Course Syllabus

offered by Department of Biostatistics
with effect from Semester B 2023/24

Part I Course Overview

Course Title:	**Time Series Analysis**
Course Code:	**BIOS6900**
Course Duration:	**1 semester**
Credit Units:	**3 CUs**
Level:	**P6**
Medium of Instruction:	**English**
Medium of Assessment:	**English**
Prerequisites: *(Course Code and Title)*	**Nil**
Precursors: *(Course Code and Title)*	**Nil**
Equivalent Courses: *(Course Code and Title)*	**Nil**
Exclusive Courses: *(Course Code and Title)*	**Nil**

Part II Course Details

1. Abstract

This course will aim to provide students with a working knowledge of modern statistical method for analysing time series data and familiarize them with various forecasting techniques. Topics covered in this course will include ARMA models, model identification and parameter estimation, model comparison, diagnostic checking, modelling seasonal data, variable selection, syndromic surveillance.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Understand the fundamental necessity and challenges of forecasting in various situations	15%	√	√	
2.	Ability to choose and apply an appropriate time series model in a particular environment	50%	√	√	√
3.	Know how to assess and compare models, and improve forecast with better statistical models based on statistical analysis	35%	√	√	√
		100%			

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.

A3: *Accomplishments*
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.			Hours/week (if applicable)
		1	2	3	
Teaching	Learning through teaching is primarily based on lectures	√	√	√	3 hours/ week
Assignments	Learning through assignments (including computer assignments) allows students to perform critical problem analysis and develop hands-on skills usingsoftware	√	√	√	

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.			Weighting	Remarks
	1	2	3		
Continuous Assessment: 60%					
Assignments	√	√	√	30%	
Midterm/quiz	√	√	√	30%	
Examination: 40%					
Examination (duration: 2 hours)	√	√	√	40%	
				100%	

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Assignment	Problem solving skills and software usage	High	Significant	Moderate	Not even reaching marginal level
2. Midterm/quiz	Problem solving based on comprehensive understanding	High	Significant	Moderate	Not even reaching marginal level
3. Examination	Problem solving based on comprehensive understanding	High	Significant	Moderate	Not even reaching marginal level

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

Autoregression; Smoothing; Causality; Confidence interval and hypothesis testing; Stationary models; Model checking; Seasonal effect

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

Nil

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Forecasting and Time Series", by Bowerman and O'Connell
2.	Time Series Analysis: Forecasting and Control" by Box, Jenkins, Reinsel and Ljung