MA2172: APPLIED STATISTICS FOR SCIENCES AND ENGINEERING

Effective Term

Semester A 2022/23

Part I Course Overview

Course Title

Applied Statistics for Sciences and Engineering

Subject Code

MA - Mathematics

Course Number

2172

Academic Unit

Mathematics (MA)

College/School

College of Science (SI)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

MA2506 Probability and Statistics
MA2510 Probability and Statistics
MA2177 Engineering Mathematics and Statistics

Part II Course Details

Abstract

This course aims to introduce statistics and its applications for science and engineering students. The objective is intended for students to solve some practical by statistical l methods. It will help students develop skills in thinking and analysing problems from a probabilistic and statistical point of view.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	explain clearly concepts from probability and statistics.	10	x		
2	evaluate various quantities for probability distributions and random variables.	20		x	
3	perform statistical computations.	30		x	x
4	develop probabilistic and statistical models for someapplications, and apply statistical methods to a range of problems in science and engineering.	20		x	x
5	the combination of CILOs 1-4	20	x	x	x

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 real-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.

Teaching and Learning Activities (TLAs)

	TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Learning through teaching is primarily based on lectures.	1, 2, 3, 4, 5	39 hours in total
2	Tutorials	Learning through tutorials is primarily based on interactive problem solving allowing instant feedback.	1	2 hour
3	Tutorials	Learning through tutorials is primarily based on interactive problem solving allowing instant feedback.	2	3 hours

4	Tutorials	Learning through tutorials is primarily based on interactive problem solving allowing instant feedback.	3	4 hours
5	Tutorials	Learning through tutorials is primarily based on interactive problem solving allowing instant feedback.	4, 5	4 hours
6	Tutorials	Learning through take-home assignments helps students understand basic concepts and techniques of statistics, and some applications in engineering.	1, 2, 3, 4, 5	after-class
7	Online applications	Learning through online examples for applications helps students apply statistical and computational methods to some problems in engineering applications.	4	after-class
8	Math Help Centre	Learning activities in Math Help Centre provides students extra help.	2, 3, 4	after-class

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Test	2, 3	20	Questions are designed for the first part of course to see how well the students have learned basic concepts and techniques of probability and estimation of parameters and some applications.
2	Hand-in assignments	1, 2, 3, 4	10	These are skills based assessment to see whether the students are familiar with the basic concepts, techniques of probability and statistics and related applications in science and engineering.

3	Formative take-home assignments	1, 2, 3, 4, 5	0	The assignments provide students chances to demonstrate their achievements on statistics and its applications learned in this course.

Continuous Assessment (%)

30

Examination (%)

70

Examination Duration (Hours)

2

Additional Information for ATs

For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

Assessment Rubrics (AR)

Assessment Task

1. Test

Criterion

Capacity to evaluate various quantities for probability and statistical distributions

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

2. Hand-in assignments

Criterion

Ability to understand basic concepts of probability and statistics

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
3. Formative take-home assignments

Criterion
Ability to explain basic concepts of probability and statistics, and performstatistical computations

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
4. Examination

Criterion
Ability to apply probability and statistical methods to a range of problems in science and engineering

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Random variables. Distribution. Data and sample description. Estimation of parameters. Tests of hypothesis. Regression. ANOVA.

Reading List

Compulsory Readings

	Title
1	For further detailed information, please refer to https://www.cityu.edu.hk/ma/programmes/undergraduate/non-BSCM-students/topics-recommended-readings-servicing-courses#heading11

Additional Readings

	Title
1	Nil