City University of Hong Kong
Course Syllabus

Department of Infectious Diseases and Public Health
with effect from Semester A 2023/2024

Part I   Course Overview

Course Title: Introduction to Biostatistics in One Health

Course Code: PH5102

Course Duration: 1 semester

Credit Units: 3 credits

Level: P5

**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**

    Statistics play a pivotal role in public health research and practice. Biostatistics is the application of statistical tools and methods to health and biological data, which are continuously recorded through medical observations and epidemiological studies. This course provides the graduate students in public health and epidemiology with the basic knowledge and skills required in collection, management, visualization, and analysis of health data. Key concepts in statistical inference and hypothesis testing will be covered. This course will enable students to understand, describe, and visualize health data sets, design experimental studies, conduct basic statistical analyses, and attain the necessary foundation for learning more sophisticated statistical methods.

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.	To gain an understanding of the key statistical concepts applied to public health		✓	✓	
2.	To collect, organize, and visualize public health and epidemiological data		✓	✓	✓
3.	To make inferences about health-related parameters in different populations		✓	✓	✓
4.	To design various types of studies and analyse the resultant data		✓	✓	✓
		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. 1	2	3	4	Hours/week (if applicable)
Lectures	Lectures introduce the fundamental concepts and methods applied in biostatistics, including data collection, organization, and visualization, descriptive statistics, sampling (sample size and power), key concepts of probability, estimation of population parameters (proportions and means), analysis of variance, correlation analysis, and basic statistical tests of hypothesis.	✓	✓	✓	✓	2/h per week
Hands-on practical exercises	Hands-on, problem-based exercises (data manipulation and analysis) will be conducted to facilitate the conceptual understanding, using R software & STATA		✓	✓	✓	1/h per week

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No. 1	2	3	4	Weighting	Remarks
Continuous Assessment: 50%						
Classroom assessment	✓	✓	✓	✓	10%	This assessment will be based on the student's class attendance and active participation
Midterm examination	✓	✓			40%	This will include all topics covered by the end of Week 6
Final examination (duration: 2 hours)			✓	✓	50%	This will include all topics covered from Week 7 to the end of the semester
					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. Classroom assessment	The attendance and active participation of students in the classes and hands-on exercises.	Participation in >90% of the classes	Participation in 85-90% of the classes	Participation in 70-85% of the classes	Limited participation in classes (<70%)
2. Midterm examination	The comprehension of the concepts and topics taught in the classes (end of Week 6), and ability to communicate that in the written format and using relevant computer software	Students achieve $\geqslant$ 86% of the mark in the examination	Students achieve $\geqslant$ 70 and < 86 of the mark in the examination	Students achieve $\geqslant$ 50 and < 70 of the mark in the examination (C letter grade is at least 50% or greater)	Students achieve <50% of the mark in the examination
3. Final examination	The comprehension of the concepts and topics taught in the classes (from Week 7 to the end), and ability to communicate that in the written format and using relevant computer software	Students achieve ≥ 86% of the mark in the examination	Students achieve $\geqslant$ 70 and < 86 of the mark in the examination	Students achieve $\geqslant$ 50 and < 70 of the mark in the examination (C letter grade is at least 50% or greater)	Students achieve <50% of the mark in the examination

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.)

Biostatistics; public health; data visualization, data analysis; study design; statistical inference

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.)

1.	Burt Gerstman. 2014. Basic Biostatistics: Statistics for Public Health Practice, Second Edition; Jones & Bartlett Learning. ISBN-13: 978-1284036015

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

1.	Wayne W. Daniel & Chad L. Cross. 2013. Biostatistics: A Foundation for Analysis in the Health Sciences, Tenth Edition, Wiley. ISBN-13: 978-1118302798 http://docshare02.docshare.tips/files/22448/224486444.pdf
2.	Dohoo, Ian Robert, S. Wayne Martin, and Henrik Stryhn. 2012. Methods in Epidemiologic Research. Charlottetown, P.E.I.: VER, Inc.