PH6201: ADVANCED EPIDEMIOLOGY

Effective Term
Semester B 2024/25

Part I Course Overview

Course Title
Advanced Epidemiology

Subject Code
PH - Infectious Diseases and Public Health
Course Number
6201

Academic Unit
Infectious Diseases and Public Health (PH)

College/School
Jockey Club College of Veterinary Medicine and Life Sciences (VM)

Course Duration
One Semester

Credit Units
3

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
PH5103 Principle of Epidemiology and One Health, and PH5102 Introduction to Biostatistics in One Health or PH5106 Fundamentals of Epidemiology in Public Health, and PH5105 Basic Biostatistics in Public Health or equivalent

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

Epidemiology is the study of the distribution and determinants of health-related states and events (e.g., diseases) in specified populations. Epidemiology provides public health scientists and researchers with tools and methods to investigate the outbreak and spread of diseases at various scales. In this course, graduate students in Public Health and Epidemiology who have already gained an appropriate understanding of the principles of epidemiology and general statistics will take on more advanced topics, focusing on quantitative techniques and regression models in order to manipulate and analyse complicated public health data collected through research studies and surveys. A range of practical modelling techniques, such as multivariable regression models, addressing continuous, binary, count, and survival (time-to-event) outcomes/data, as well as quantitative bias analysis will be covered. In Public Health, clustering of diseases in certain locations and points in time is very common. Thus, general techniques to handle and analyse such aggregate-level data will also be introduced; e.g., multilevel (mixed-effects) regression modelling as well as systemic reviews and meta-analyses.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Explain the features of different epidemiological study designs, including the strength, limitations and analytical methods specific to each study type.		x	x	x
2	Assess potential biases in epidemiological studies		x	x	x
3	Describe the process of statistical model-building to address specific public health issues or questions		x	x	x
4	Explain the fundamental concepts of environmental and occupational epidemiology, molecular epidemiology and outbreak investigation.		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.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Students are introduced to the fundamental features of different epidemiological study designs, and key principles of environmental, occupational and molecular epidemiology.	1, 2, 3, 4	2/h per week

2	Tutorials	Students will participate in tutorials to facilitate conceptual understanding including critical appraisal of the literature and study design.	1, 2, 3, 4	1/h per week

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Classroom assessment	1, 2, 3, 4	20	This assessment will be based on the student's attendance and active class participation
2	Midterm examination	1, 2	40	This will include all topics covered by the end of Week 6

Continuous Assessment (%)

60

Examination (%)

40

Examination Duration (Hours)

2

Assessment Rubrics (AR)

Assessment Task

1. Classroom assessment (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Student's attendance and active participation in the classes and tutorials.

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. Midterm examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Student's comprehension of the concepts and topics taught in the classes by the end of week 6, and their ability to communicate this understanding in written format using relevant computer software, will be
assessed

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. Final examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Student's comprehension of the concepts and topics taught from week 7 onwards, and their ability to communicate this understanding in the written
format using relevant computer software, will be assessed

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

1. Classroom assessment for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

The attendance and active participation of students in the classes and tutorials

Excellent

(A+, A, A-) Participation in >90% of the classes

Good

(B+, B) Participation in 85-90% of the classes

Marginal

(B-, C+, C) Participation in 70-85% of the classes

Failure

(F) Limited participation in classes (<70%)

Assessment Task

2. Midterm examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

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, will be assessed.

Excellent

(A+, A, A-) Students achieve $\geq$ 86% of the mark in the examination

Good

(B+, B) Students achieve $\geq$ 70 and < 86 of the mark in the examination

Marginal

(B-, C+, C) Students achieve $\geq$ 50 and < 70 of the mark in the examination (C letter grade is at least 50% or greater)

Failure

(F) Students achieve <50% of the mark in the examination

Assessment Task

3. Final examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

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, will be assessed.

Excellent

(A+, A, A-) Students achieve $\geq$ 86% of the mark in the examination

Good

(B+, B) Students achieve $\geq$ 70 and < 86 of the mark in the examination

Marginal

(B-, C+, C) Students achieve $\geq$ 50 and < 70 of the mark in the examination (C letter grade is at least 50% or greater)

Failure

(F) Students achieve <50% of the mark in the examination

Part III Other Information

Keyword Syllabus

Epidemiology, regression model building, survival analysis, clustered data, mixed-effects models, quantitative bias analysis

Reading List

Compulsory Readings

	Title
1	Dohoo, Ian Robert, S. Wayne Martin, and Henrik Stryhn. 2012. Methods in Epidemiologic Research. Charlottetown, P.E.I.: VER, Inc.
2	Szklo M, Nieto FJ. 2014. Epidemiology: beyond the basics. Jones & Bartlett Publishers

Additional Readings

	Title
1	Boland, A., Dickson, R. and Cherry, G., 2017. Doing a systematic review: A student's guide. Doing a Systematic Review, pp.1-304.