VM2100: STATISTICS FOR EVIDENCE-BASED BIOLOGICAL AND VETERINARY SCIENCES

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Statistics for Evidence-based Biological and Veterinary Sciences

Subject Code
VM - Jockey Club College of Veterinary Medicine and Life Sciences
Course Number
2100

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

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

This course aims to introduce statistics and its applications to veterinary students. The objective is for students to develop the necessary skills to understand and apply basic statistical concepts and quantitative research strategies, to critically assess veterinary literature and appreciate the use of statistics in evidence-based veterinary medicine.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe, explain and apply basic statistical concepts, ideas and techniques	10		x	
2	Describe, summarise and interpret data in order to identify patterns and trends	20	x	x	x
3	Identify the principles of quantitative research design and explain concepts such as bias, sampling and non-sampling error, and sample size	20		x	
4	Apply commonly used data analysis techniques as appropriate for the data-set in order to solve problems and prove hypotheses (descriptive statistics, confidence interval, hypothesis testing, regression, ANOVA)	30		x	
5	Conduct a systematic literature search and critically evaluate the scientific literature in order to demonstrate the application of scientific evidence to decision-making	20	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 will participate in lectures that serve as the primary mode of learning in this course. Through these lectures, students will be exposed to the core statistical principles, concepts, and methodologies that are essential for evidence-based decision-making in the biological and veterinary sciences. The lectures will provide a solid theoretical foundation, equipping students with the necessary knowledge and skills to effectively analyze, interpret, and apply statistical information in their future professional endeavors.	1, 2, 3, 4, 5	1.5 hrs/wk

2	Practicals	Students will engage in computer-based practical classes that focus on interactive problem-solving, providing them with opportunities for instant feedback and hands-on application of the statistical concepts covered in the lectures. These practical sessions will allow students to work through real-world data analysis scenarios using statistical software and programming tools. By actively participating in the problem-solving exercises, students will develop essential skills in data management, statistical modeling, and interpretation of results. The interactive nature of the practical classes will enable students to receive immediate feedback on their work, allowing them to identify areas for improvement and reinforce their understanding of the statistical methods. This experiential learning approach will help bridge the gap between the theoretical knowledge and the practical application of statistics in the biological and veterinary sciences. Through the computer-based practical classes, students will gain hands-on experience in the entire data analysis workflow, from data collection and preparation to the communication of statistical findings. This will equip them with the necessary competencies to effectively contribute to evidence-based decision-making in their future careers.	1, 2, 3, 4, 5	1.5 hrs/wk

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Test	1, 2, 3	20	Questions are designed for the first part of the course to assess students' progress in describing and applying basic statistical concepts and techniques	No
2	Assignments**	1, 2, 3, 4, 5	30	These are skills based assessment to assess whether the students are familiar with the basic statistical concepts, techniques and interpretation of statistics and related applications in veterinary medicine and provide students chances to demonstrate the application of statistics.	No

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

** A penalty of 5% of the total marks for the assessment task will be deducted per working day for late submissions, and no marks will be awarded for submissions more than 10 working days late.

Assessment Rubrics (AR)

Assessment Task

1. Test

Criterion

Capacity to evaluate various quantities for statistical methods

Excellent (A+, A, A-)

High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Basic for C+ and C. See additional information for AR regarding mark range below, as in the BVM programme only C+ and C grades are awarded

Marginal (D)
Not applicable for the BVM programme

Failure (F)
Not even reaching marginal levels

Assessment Task
2. Assignments

Criterion
Ability to explain basic concepts of statistics, and perform and interpret statistical analyses

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Basic for C+ and C. See additional information for AR regarding mark range below, as in the BVM programme only C+ and C grades are awarded

Marginal (D)
Not applicable for the BVM programme

Failure (F)
Not even reaching marginal levels

Assessment Task
3. Examination

Criterion
Ability to apply statistical methods to a range of problems in veterinary medicine

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Basic for C+ and C. See additional information for AR regarding mark range below, as in the BVM programme only C+ and C grades are awarded

Marginal (D)

Not applicable for the BVM programme

Failure (F)

Not even reaching marginal levels

Additional Information for AR

Mark Range

The following is the mark range for each letter grade that must be used for assessment of courses offered by the PH and VCS Department of JCC

(including Gateway Education (GE) courses):

Letter Grade	Mark Range	Letter Grade	Mark Range
A+	≥92%	C+	54-60.99%
A	87-91.99%	C	50-53.99%
A-	82-86.99%	F	<50%
B+	75-81.99%		
B	68-74.99%		
B-	61-67.99%		

Part III Other Information

Keyword Syllabus

Random variables, Probability, Distributions, Significance, Hypothesis, Statistical Test, Applications in Evidence-Based Biomedical and Veterinary Sciences.

Reading List

Compulsory Readings

	Title
1	Petrie, A. and Watson, P. (2013). Statistics for Veterinary and Animal Science. Wiley-Blackwell. ISBN-13: 978-0470670750 ISBN-10: 0470670754

Additional Readings

	Title
1	Lane, D. Introduction to Statistics: Online Textbook http://onlinestatbook.com/Online_Statistics_Education.pdf
2	McDonald, J. Handbook of Biological Statistics http://www.biostathandbook.com
3	Pfeiffer, D. (2010).Veterinary Epidemiology: An Introduction, 1st Edition. Wiley-Blackwell.
4	Evans, R. and O’ Connor, A. (2007). Statistics and evidence-based veterinary medicine: Answers to 21 common statistical questions that arise from reading scientific manuscripts. Veterinary Clinics: Small Animal Practice 37: 477–486.