



MURANG'A UNIVERSITY OF TECHNOLOGY

COURSE OUTLINE

Unit Code: AMS 105

Unit Title: Introduction to Biostatistics

Department: MAS

Lecturer's Name: Ms Wanjau

Lecturer's Tel. No. 0713091213 Email Address: agiewanjau@gmail.com

Contact Hours:

Semester: Sept. –Dec. Academic Year: 2019/2020

Expected Learning Outcomes

1. Apply statistical methods in health and biological data.
2. Appreciate the role of Biostatistics in health science.
3. Differentiate among the various sampling procedures.
4. Describe the different scales of measurements, apply appropriate descriptive and inferential analysis methods and interpret the results.
5. Distinguish among commonly used discrete and continuous probability distributions and their applications.
6. Analyse real world data using methods presented.
7. Explain the logic behind statistical confidence interval and hypothesis tests in relation to health data.

Teaching Methodology

1. Lectures
2. Tutorials
3. Class/group discussions

Instructional Materials

1. Handouts.
2. Whiteboard.
3. Marker pens.

Course Evaluation Methods

1. C.A.T.S : 30%
2. END OF SEMESTER EXAM: 70%
3. TOTAL: 100%

References

1. Ziliak, S. T., & McCloskey, D. N. (2011). The cult of statistical significance. *Ann Arbor: University of Michigan Press, 31.*
2. Biswal, P. C. (2007). *Probability and statistics*. PHI Learning Pvt. Ltd..
3. Dawson-Saunders, B., & Trapp, R. G. (1994). *Basic and clinical biostatistics* 2nd edn. Norwalk: Appleton & Lange, 54.

4. Sokal, R. R., & Rohlf, F. J. (1987). Introduction to biostatistics. *New York*.

WEEK NO.		TOPIC	SUB TOPIC(S)
1.		Introduction	Definition of terms, types of variables, scales of measurement, probability and non-probability sampling methods, primary and secondary data, Sources of statistical data, Methods of data collection
2.	DATA PRESENTATION METHODS	Describing one variable at a time	One quantitative variable: histograms, stem plot, box plot, dot plot, measures of center, dispersion and location, outliers
3.			One categorical variable: frequency tables, pie charts, bar charts
4.		Describing two variables at a time	Variable roles as either dependent or independent, classification of outcome and explanatory variable (continuous, discrete, ordinal, nominal)
5.		Describing the relationship between two continuous variables: Correlation analysis	scatter plot, correlation coefficient (Spearman, Pearson), coefficient of determination
6.		Describing the relationship between two continuous variables: Regression analysis	Simple linear regression, interpreting regression coefficients
7.		Probability	Introduction to probability, elementary probability rules, conditional probability
8.		Discrete Probability distributions	Binomial, Poisson and their applications in biological sciences
9.		Continuous probability distributions	Normal, standard normal, calculating probabilities of normal distribution
10.		Sampling distributions	Sampling distributions of the sample mean and the sample proportion
11.		Inferential statistics: estimation	Point estimation/ interval estimation: population mean and population proportion
12.		Inferential statistics: hypothesis testing	Definition of terms, procedure of hypothesis testing, testing hypothesis about the normal population mean when sigma is known
13.			Testing hypothesis about the normal population mean when sigma is unknown Hypothesis testing for proportions