

Planning and Quality Assurance Affairs

Form (A)

Course Specifications

General Information

Course name	Research Methodology & Biostatistics
Course number	AMSL4324
Faculty	
Department	
Course type	Major Needs
Course level	4
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

<p>1 - The course aims to enhance the understanding and practical application of biostatistics and research methods among students, with a focus on their application in health and medical technology. The course will cover a broad range of topics related to biostatistics and research methods, with a specific emphasis on statistical tests used in medical research analysis.</p>

Intended Learning Outcomes

<p>Knowledge and Understanding</p>	<p>* This course is intended to provide medical technology students with an overview of the health research methods and biostatistical testing which can be applied to their specialties and interest. The course will cover different research designs and methodologies, survey research, sampling strategies, program evaluation, and validity and reliability threats, including writing research proposals. The course will cover different sampling strategies, descriptive and inferential statistics, parametric and SPSS computer software, distribution of variables, sampling distribution, probability, data presentation, hypothesis testing, and another statistical testing including Chi-square, ANOVA, t-test, correlation and regression, and some non-parametric statistical operations. At the end of the course, the students are required to develop a research proposal preferably on the topic of interest. This should address one of the related health issues, which are prevalent locally, regionally or internationally and can have practical implications for promoting health practice.</p>
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Course Contents

1 - - Research concepts and uses. Steps in writing a research proposal - Formulation of a topic - Defining a research problem - Research proposal guidelines - Differences between proposal and thesis. - Chapter 1: introduction (background - objective, problem statement - Justification - Hypothesis- the significance of study) - References. - Chapter 2: a Literature review (content and how selected related study) - Chapter 3: Methodology (Study design - Target population - Setting of the study - Sample size - Sampling strategies - Eligibility criteria (Inclusion and Exclusion) - Ethical consideration - Data collection - Questionnaire interview - Study instruments - Equipment - Validity - Reliability - Limitations of the study - Pilot Study) - Qualitative research and presentation of a proposal Chapter 4: Results - Introduction to statistics ? Importance of medical statistics ? Difference between data and information ? Study problem, Objectives, Hypothesis, and question ? Variables (Definition & Type) ? Characteristics & Types of data ? Process of medical biostatistics ? Using statistical software (statistical package for the social sciences (SPSS)) - Method of data description ? Measures of central tendency (Central location) ? Measures of dispersion (Spread of Data) ? Determination of data normality ? Difference between one tail and two tail in the normal curve ? Type of tables ? Type of graph - The normal (Standard) distribution ? The area under the normal distribution ? Application of the normal distribution - Types of statistical inference a) Inference on a sample b) Inference on a population - Estimators parameter ? Point estimator ? Interval estimator - The confidence interval - Hypothesis ? Type of hypothesis ? Steps of hypothesis testing ? A practical example of hypothesis testing ? Probability (P-value) ? Types of errors (type I & II error) - Chi-square, t-test, and ANOVA test - Simple correlation and Regression and how to critique a published statistical result Chapter 5: Discussion Chapter 6: Conclusion and recommendations

Students Assessment

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
Midterm	1 hours	30
Final	2 hours	40
activities		30

Books and References

Essential books

References: • Saha, I., & Paul, B. (2020). Essentials of biostatistics & research methodology. Academic Publishers. • Rossi, R. J. (2022). Applied biostatistics for the health sciences. • Sullivan, L. M. (2022). Essentials of biostatistics for public health. Jones & Bartlett Learning. • Kumar, R. (2019). Research methodology: A step-by-step guide for beginners. Sage Publications Limited.