

# SCI JAN-APRIL 2023

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## SPS 2247 STATISTICAL COMPUTING I COURSE OUTLINE

KYU/F/ASA/02

DEPARTMENT: PURE AND APPLIED SCIENCES

PROGRAMME: BACHELOR OF SCIENCE IN FINANCIAL ENGINEERING

YEAR: 2 SEMESTER: II

UNIT CODE: SPS 2249 UNIT TITLE: Statistical Computing I

LECTURE HOURS: 45 Hrs. CREDIT HOURS: 45Hrs

Pre-requisites: PROBABILITY AND STATISTICS I

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### Purpose

To equip students with the skills to enable them to perform basic statistical analysis using standard statistical software and interpret the results

### Objectives

By the end of this course the student should be able to;

1. Analyse Statistics using R programming Language.
2. Recognize accuracy or misleading quantitative information.
3. Interpret the results from the data analyzed
4. Use a computer programme in estimation of the measures of central tendency and dispersion.
5. Use a computer to estimate simple linear regression models.
6. Apply statistical computer packages for handling statistical techniques such as graphics, sampling variability. Computation of density, distribution and quartile functions for probability distribution.

### Course work plan

1. Introduction to R programming: Definition and Features of R
2. R-Data types: Vectors, Lists, Matrices, Arrays, Factors and Data Frames and their operations.
3. Measures of Central tendency: Arithmetic mean, Harmonic Mean, Geometric Mean, Mode, Median and Quartiles.
4. Measures of Dispersion: Range, Variance, Kurtosis and Skewness.
5. CAT I
6. Regression Analysis: Simple Linear Regression and Correlation coefficient

7. Regression: Pearson correlation and spearman Rank correlations
8. Exploratory Data analysis: Data analysis.
9. Computation of Density: Binomial, Poisson, Normal
10. CAT II
11. Computation of distributions: Gamma, Beta, and Chi-square.
12. Computation of Quintiles: Hyper-geometric distributions and exponential.
13. Computation of Density: Uniform and Weibull distributions.
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15. EXAMINATION.
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## **Teaching Methods**

1. Lecture: oral presentation generally incorporating additional activities, e.g. writing on a chalk-board, exercises, class questions and discussions, or student presentations.
2. Practical: a laboratory experiment/session as a means of further actively involving students.
3. Tutorial: to give the students more attention.

## **Instructional Material/Equipment**

Include course notes, black-and white-board, chalk, white-board marker, duster, computer and projector.

## **Assessment**

1. Written end of semester Examination comprising 70% of the total marks
2. Continuous Assessment Tests within the semester comprising 30% of the total marks (Tests 15%, Practical 10%, Assignment 5%)

## **Course Text Books**

1. Crawley. Statistics: An Introduction Using R John Wiley & Sons, 2005 ISBN 0470-02297-3
2. RV Hogg, JW McKean & AT Craig Introduction to Mathematical Statistics, 6th ed. Prentice Hall, 2003 ISBN 0-13-177698-3