Open Elective Offered by the Department of Statistics, University of Calicut

(for the First Semester of 2-Year PG Programmes (2025 Admission))

Name of the faculty member: Famida C V
Mobile number: 9074499207
Email ID: famida.c.v.96@gmail.com

SYLLABUS

STA07E506: Statistical Techniques for Data Analysis (4 Credits)

Course Outcomes: On successful completion of the course, students will be able to:

CO1: Express data graphically.
CO2: Compute different measures of central tendency, dispersion and correlation coefficient.
CO3: Define Probability, conditional probability and independence of events.
CO4: Apply Simple Random Sampling with and without replacement.
CO5: Define Binomial, Poisson and Normal Distributions and apply them for real data modeling.
CO6: Develop confidence intervals under different set up.
CO7: Carry out one way and two way ANOVA.

Unit-I. Biostatistics – Definition, Applying Statistical Methods, Descriptive Methods – Tabular and Graphical Presentation of Data – Frequency Tables, Line Graphs, Bar Charts, Histograms, Stem and Leaf Plots, Dot Plots, Scatter Plots. Measures of Central Tendency – Mean, Median and Mode. Measures of Dispersion – Range and Percentiles, Box Plots, Variance. Correlation Coefficients – Pearson Correlation Coefficient, Spearman Rank Correlation Coefficient.

Unit-II. Probability – Definition, Conditional Probability, Independence of events, Baye's Theorem, Probability Sampling – Sampling With Replacement, Sampling Without Replacement. Designed Experiments – Single and Double Blind experiments. The Life Table – The First Four Columns in the Life Table – Uses of Life Table. Probability Distributions – Binomial , Poisson and Normal, Central Limit Theorem. Sampling Distributions-t ,χ^2 and F distributions (Concepts and applications).

Unit-III. Interval Estimation – Confidence Intervals Based on the Normal Distribution, Confidence Intervals for the Difference of Two Means and Proportions. Tests of Hypotheses – Preliminaries. Testing Hypothesis about the Mean. Testing Hypothesis about

the Difference of Two Means. Analysis of Categorical Data – Goodness of Fit Test, Contingency Table.

Unit-IV. Analysis of Variance – Assumptions for the Use of ANOVA – One-Way ANOVA, Two-Way ANOVA. Concept of Regression – Simple Linear Regression, multiple linear regression; Basic concept of multivariate distributions.

(Practical using R/Python software of the contents of this course)

Text Books

1. ParimalMukhopadhyay (2016). Mathematical Statistics. Books and Allied
2. ParimalMukhopadhyay (2012). Theory of Probability.New Central Book Agency.
3. Forthofer, R., Lee, E. S. and Hernandez, M.(2007). Biostatistics – A Guide to Design, Analysis and Discovery- Second Edition. Elsevier.

References

1. Rastogi, V. B. (2015). Fundamentals of Biostatistics-Third Edition. Ane Books India, New Delhi.
2. SundarRao, P. S. S. and Richard, J. (2012). An Introduction to Biostatistics-Third Edition. Prentice Hall of India, New Delhi.
3. S. P. Gupta (2021). Statistical Methods-46th Edition. Sultan Chand & Sons.

****