



KARNATAKA STATE AKKAMAHADEVI WOMEN'S UNIVERSITY, VIJAYAPURA

Department of Statistics

Master of Statistics (M.Sc.) programme has been designed to prepare graduates for attaining the following programme outcomes:

PO1 : Inculcate critical thinking to carry out scientific investigation objectively without being biased with pre-conceived notions.

PO2 : Equip the student with skills to analyze problems, formulate a hypothesis, evaluate and validate result, and draw reasonable conclusions thereof.

PO3 : Prepare students for pursuing research or careers in industry in mathematical sciences and applied fields.

PO4 : Imbibe effective scientific and/or technical communication in both oral and writing.

PO5 : Continue to acquire relevant knowledge and skills appropriate to professional activities and demonstrate highest standards of ethical issues in mathematical sciences.

PO6 : Create awareness to become an enlightened citizen with commitment to deliver one's responsibilities within the scope of bestowed rights and privileges.

SEMESTER I

22STHCT1.1	Probability Theory	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

CO1 : A person successfully completing the Course will acquire basic knowledge of axiomatic Probability Theory.

CO2 : This basic course is a prerequisite to an advanced course as well as to understand topics in Mathematical Statistics.

CO3 : Knowledge gained about Chebyachev's WLLN.

CO4 : Knowledge gained about Kolmogorov's inequality.

22STHCT1.2	Distribution Theory	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

CO1 : A person successfully completing the Course will acquire basic knowledge of axiomatic distribution Theory.

CO2 : This basic course is a prerequisite to an advanced course as well as to understand topics in Mathematical Statistics.

CO3 : Competency developed on Applications of various distributions.

CO4 : Competency developed on Applications of Characteristic function of various distributions.

22STHCT1.3	Matrix Theory and Linear Models	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

CO1 : A person successfully completing the Course will acquire basic knowledge of Matrix Theory and linear models.

CO2 : This basic course is a prerequisite to an advanced course as well as to understand topics in Mathematical Statistics.

CO3 : Knowledge gained about matrix applications.

22STHCT1.4(b)	Linear Programming	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

CO1 : A person successfully completing the Course will acquire basic knowledge of graphs of feasible and simplex method.

CO2 : This basic course is a prerequisite to an advanced course as well as to understand topics in Mathematical Statistics

CO3 : Knowledge gained about scope of operation research .

22STHCT1.5	Practical (Based on 21STHCT 2.2 and 21STHCT 2.3)	
Credits: L:2	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

22STHCT1.6	Practical based on Statistical Computing using R	
Credits: L:2	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

22STOEP1.1	Statistical Methods and Applications	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

CO1: A person successfully completing the Course will be exposed to basic statistical methods used to analyse data and enough applications of such methods.

CO2: Basic ideas about statistical linear programming.

CO3: Basic ideas about Competitive exams and Statistics.

CO4: Helps to build careers in Industry.

SEMESTER II

22STHCT2.1	Real Analysis	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

CO1: A person successfully completing the Course will have enough knowledge of Real Analysis including standard techniques used in proofs of results in Real Analysis.

CO2: Standard skills to solve problems in Analysis are learnt in the Course and these are useful to understand topics in Probability Theory and Mathematical Statistics.

CO3 : Apply to obtain results and solve problems in these subjects.

22STHCT2.2	Statistical Inference I	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes :

CO1 : A person successfully completing the Course will acquire knowledge of many topics in basics of mathematical statistics which is a prerequisite to advanced topics in mathematical statistics.

CO2 : Knowledge gained about estimation and confidence intervals.

CO3 : Knowledge gained about Exponential family.

22STHCT2.3	Design and Analysis of experiments	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes :

CO1 : A person successfully completing the Course will acquire a good foundation on designing and analysing statistical experiments and can independently carry out advanced statistical modelling of several types of data using designs.

CO2 : Knowledge gained about Tests of hypotheses for one and more than one linear parametric functions.

CO3 : Knowledge gained about Factorial experiments.

22STHCT2.4(a)	Survival Analysis	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

CO1 : A person successfully completing the Course will be exposed to specialized statistical methods used to analyse life time data and to model life time data practically.

CO2 : Knowledge gained about Failure rates.

CO3 : Knowledge gained about estimation of survival function.

22STHCT2.4(b)	Sampling Theory	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes :

CO1 : A person successfully completing the Course will acquire a very good knowledge of standard sampling designs and a comprehensive knowledge of Statistics used in study of National Development and the Course also has Practical problem solving and data analysis techniques.

CO2 : Knowledge gained about Basic Definitions and Applications of SRS (WR/WOR), Strs.

CO3 : Skills gained about Estimation of National Income - product approach, income approach and expenditure approach

22STHCT2.5	Practical based on 21STHCT 2.3	
Credits: L:2	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

22STHCT2.6	Practical (Based on 21STSTCT 2.4(b))	
Credits: L:2	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

22STOEP2.1	Statistical Data Analysis	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours: 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will be exposed to basic statistical methods used to analyse data and enough applications of such methods.

C02: Basic knowledge about the statistical analysis and probability.

SEMESTER III

22STHCT3.1	Statistical Inference II	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will acquire knowledge of many advanced topics in basics of Mathematical Statistics including tests of hypotheses and nonparametric tests.

C02: Understanding the concepts of Basu's Theorem and its Applications.

C03: Applications of Method of scoring.

22STHCT3.2	Multivariate Analysis	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours: 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will acquire knowledge in analyzing multivariate data and learn special techniques that are used to analyse multivariate data.

C02: testing linear hypothesis about regression coefficients.

C03: Application in testing and interval estimation.

22STHCT3.3	Stochastic Process	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours: 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will acquire fundamental and advanced knowledge in stochastic processes which should be help apply these models to modelling random processes.

C02: Elementary renewal theorem and applications.

C03: Poisson process, pure birth process, Yule – Furry process, birth and death processes.

22STHCT3.4(a)	SQC and Reliability Theory	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours: 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will acquire knowledge in the theory of statistical SQC and reliability analysis along with learning special techniques to analyse positive valued data.

C02: Use of sequential runs in constructing control limits.

C03: Reliability Theory: Life distributions, survival functions, failure rate, Integrated hazard function, residual life time, mean residual life time.

22STHCT3.4(b)	Bio-Statistics	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours: 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will be exposed to a variety of methods used in biostatistics and the practical component helps in understanding and solving problems in biostatistics.

C02: Knowledge about the medical analysis data and clinical trails.

C03: Knowledge about the biological statistics.

22STHCT3.5	Practical (Based on 21STHCT 3.1and 21STHCT 3.3)	
Credits: L:2	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

22STHCT3.6	Practical (Based on 21STHCT 3.2)	
Credits: L:2	Teaching: 4Hrs/week Total Teaching Hours: 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

22STHOEP3.1	Statistical Data Analyses using R-I	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will be exposed to basic statistical methods used to analyse data using R and enough applications of such methods.

C02: Basic ideas about statistical software using analysis the data.

C03: Basic ideas about probability and inference.

CO4 : Helps to build careers in Industry.

SEMESTER IV

22STHCT4.1	Time Series Analysis	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will be exposed to specialized techniques to analyse data on time series and the practical component aids in understanding fitting of suitable time series models to time series data.

C02: Knowledge about the forecasting system.

22STHCT4.2	Non-Parametric Methods	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will acquire knowledge in using nonparametric methods to analyse data.

C02: Knowledge about which data have analysis for non-parametric test and data in case not normal distribution.

C03: Basic ideas about the non-parametric where its used.

22STHCT4.3	Statistical Machine Learning Algorithms Using Python	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will acquire knowledge in using python to analyse the data.

C02: Knowledge about the Visualization Using Seaborn and Matplotlib.

C03 : Helps to build the careers in Industry .

22STHCT4.4(a)	Data Science	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will acquire knowledge about data science.

C02: Knowledge about data modeling, big data analysis and menu plating.

C03: Basic ideas about the SQL and data models.

CO4 : Helps to build the careers in Industry.

22STHCT4.4(b)	Genetics Algorithms	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will acquire knowledge about Genetics algorithms.

C02: Basic knowledge about segregation and linkage and systematic forces.

C03: Knowledge about genetic variance, association and selection index.

22STHCP4.5	Project (Primary and secondary)	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

22STHOEP4.1	Applied Statistics	
Credits: L:4	Teaching: 4Hrs/week Total Teaching Hours : 52	Max. Marks: 100 C1: 15; C2: 15; C3: 70

Course Outcomes:

C01: A person successfully completing the Course will be exposed to basic statistical methods used to analyse data using R and enough applications of such methods.

C02: Basic ideas about statistical software using analysis the data.

C03: Basic ideas about probability, time series and index numbers.

CO4 : Helps to build careers in Industry.