BIDHANNAGAR COLLEGE, GOVERNMENT OF WEST BENGAL, SALTLAKE, KOLKATA

Teaching Plan for Odd Semester, UG course

Department of Statistics

Session : 2023-24

Class: B.Sc. (Hons.)
Semester 1,3,5　　　　　　　　**Name of the Teacher: Dr. Kiranmoy Chatterjeer**
Subject: Statistics
Papers: STSACOR05T &P, STSSSEC01M, STSACOR12T T&P
(Theory and Practical)

S. No.	Theory topics to be covered (Paper code to be mentioned)	Practical Works to be covered (Paper code to be mentioned)
Week 1 to week 4	**STSACOR05T:** Discrete two dimensional random variable, joint, marginal and conditional, p.m.f. and c.d.f., statement of properties of c.d.f, independence of variables, trinomial distribution. **STSSSEC01M:** Learn how to load data in MINITAB, plot a graph viz. histograms (equal class intervals and unequal class intervals), box plot, stem-leaf, frequency polygon, pie chart, ogives with graphical summaries of data. Generate automated reports giving detailed descriptive statistics, correlation and lines of regression. **STSACOR12T:** Unit-1: Index Numbers, price, quantity and value indices, choice of weights, Various formulae and their comparisons. Tests of index numbers. Fisher's ideal index number. Chain Index Number. Consumer Price Index, Wholesale Price index & Index of industrial Production- methods of construction and uses. Definition of national income.	Numerical Problems on **STSACOR05P and STSACOR12P**

| Week 5 to week 8 | **STSACOR05T**

Continuous two dimensional random variable,, joint, marginal and conditional, p.d.f., and c.d.f. Independence of two random variables, bivariate transformations with illustrations. Moments. Conditional expectation and Conditional variance. Correlation coefficient.

STSSSEC01M:
Simple analysis and create and manage statistical analysis projects, import data, code editing. Basics of statistical inference in order to understand hypothesis testing and compute p-values and confidence intervals.

STSACOR12T:

Unit-2: Measurement of poverty and inequality, Desirable properties and different descriptive measures including Gini's coefficient, Lorenz curve. | Numerical Problems on **STSACOR05P & STSACOR12P** |
| Week 9 to Week 12 | **STSACOR05T**

Moment generating function, cumulant generating function and characteristic function. Uniqueness and inversion theorems (without proof) along with applications.

Probability Distributions: Uniform, normal, exponential, Normal

STSACOR12T: | Numerical Problems on **STSACOR05P**

1. Problems based on the property of normal distribution.
2. To find the ordinate for a given area for normal distribution.
3. Application-based problems using normal distribution.
4. Fitting of normal distribution when parameters are given.
5. Fitting of normal distribution when parameters are not given.
6. Fitting of some other continuous distributions. |

	Unit-2: Use of Pareto and Log Normal distributions. Measures of unemployment. Comparative Social Statistics, Indices related to human development and gender disparity.	
Week 13	**STSACOR05T** Probability Distributions: Normal **STSACOR12T:** Unit-1: A brief account of product, expenditure and income approaches for estimation of National Income. Unit-3: Present official statistical system in India, Methods of collection of official statistics, their reliability and limitations. Role of Ministry of Statistics and Program Implementation (MoSPI).	Numerical Problems on **STSACOR05P and STSACOR12P**
Week 13 to week 14		**Internal Exam**
Week 15 to 17	**STSACOR05T** Probability Distributions: Cauchy, beta, gamma, lognormal, logistic, double exponential and Pareto along with their properties and limiting/approximation cases. Bivariate Normal Distribution and its properties Unit-4: Central Statistical Office (CSO), National Sample Survey Office (NSSO), and National Statistical Commission. Government of India's Principal	Numerical Problems on **STSACOR05P**

	publications containing data on the topics such as population, industry and finance.	
Week 18	Revision, Practise	Revision

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Teaching Planfor Even Semester, UG course

Department of Statistics

Session (2023-2024)

Class: B.Sc. (Hons.)
Semester 2,4,6   **Name of the Teacher: Dr. Kiranmoy Chatterjeer**
Subject: Statistics
Papers: STSACOR02T &P, STSACOR09M, STSADSE04 T&P
(Theory and Practical)

S. No	Theory topics to be covered (Paper code to be mentioned)	Practical Works to be covered (Paper code to be mentioned)
Week 1 to week 4	**Paper STSACOR02T(CBCS) :** Vector spaces, subspaces, sum of subspaces, Span. Linear dependence and independence, basis and dimension, dimension theorem. **Paper STSACOR09T(CBCS) :** Unit 2: Theory of linear estimation, Estimability of linear parametric functions, Method of least squares, Gauss-Markov theorem, Estimation space and Error Space**,** Estimation of error variance. Tests of General Linear Hypotheses (statements only)**.** Classification of Linear Models. **Paper STSADSE04T(CBCS) :** Demographic events and processes. Sources of population data, Census and registration. Errors in census and registration data. Rates and ratios of vital events.	Numerical Problems on **STSACOR02P, STSACOR09P and STSADSE04P**

Week 5 to week 8	**Paper STSACOR02T(CBCS) :** Orthogonal vectors, Gram-Schmidt orthogonalization, ortho-complement space. Null space and nullity. A review, theorems related to triangular, symmetric and skew symmetric matrices, idempotent matrices, orthogonal matrices, singular and non-singular matrices and their properties. Trace of a matrix. **Paper STSACOR09T(CBCS) :** Unit 3: Hypothesis testing in case of simple and multiple regression models. **Paper STSADSE04T(CBCS) :** Crude death rate (CDR), Specific death rate (SDR), Infant mortality rate (IMR) and Standardized death rates. Life (Mortality) tables: assumption, description and uses. Stable and Stationary population.	Numerical Problems on **STSACOR02P, STSACOR09P and STSADSE04P**
Week 9 to Week 12	**Paper STSACOR02T :** Row space and column space of a matrix. Definition, properties and applications of determinants for 3rd and higher orders, evaluation of determinants of order 3 and more using transformations. Symmetric and Skew symmetric determinants, Circulant determinants and Vandermonde determinants for nth order. **Paper STSACOR09T(CBCS) :** Analysis of Variance in one-way and two-way classified data (with equal number of observations per cell) for fixed effect models. **Paper STSADSE04T(CBCS) :**	Numerical Problems on **STSACOR02P, STSACOR09P and STSADSE04P**

	Crude Birth Rate (CBR), General Fertility rate (GFR), Specific Fertility rate (SFR) and total Fertility rate (TFR). Measurement of population growth: Crude rates of natural increase, Pearl's Vital index, Gross Reproduction Rate (GRR) and Net reproduction rate (NRR).	
Week 13	**Paper STSACOR02T :** Jacobi's Theorem. Product of determinants. Adjoint and inverse of a matrix and related properties. Use of determinants in solution to the system of linear equations. **Paper STSACOR09T(CBCS) :** Analysis of covariance for one-way and two-way classified data with one concomitant variable. **Paper STSADSE04T(CBCS) :** Population estimation, Projection and Forecasting: Use of AP and GP methods for population estimates. Fitting of population curve for population forecasting using Rhode's method.	Numerical Problems on **STSACOR02P, STSACOR09P and STSADSE04P**
Week 14	**Internal Exam**	
Week 15 to 17	Revision, Practise & problems	Revision