DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE

(Autonomous)

College with Potential for Excellence, Linguistic Minority Institution

Affiliated to University of Madras

Arumbakkam, Chennai - 600 106

DEPARTMENT OF STATISTICS (SHIFT-II)

B.SC STATISTICS – PROGRAM CODE –64

SYLLABUS WITH EFFECT FROM 2019-20

CHOICE BASED CREDIT SYSTEM

PRINCIPAL
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Head of the Department
Head
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Code& Title/Code	**: Descriptive Statistics/1964101**	**Semester : I**
Course Type	**: Core**	**Credits : 4**

Course Description

Course Content:

UNIT - 1:

Nature and scope of statistical methods and their limitations –concepts of research design- primary and secondary sources of data - nominal, ordinal, ratio and interval scale - complete enumeration, observational studies and sample surveys.

UNIT - 2:

Presentation by tables and diagrams- Construction of tables with one, two and three factors of classifications - Diagrammatic representations, frequency distributions for continuous and discrete data, graphical representation of a frequency distribution by histogram and frequency polygon, cumulative frequency distributions (inclusive and exclusive methods) and Ogives.

UNIT - 3:

Measures of location, dispersion, moments and measures of skewness and kurtosis for both grouped and ungrouped data.

UNIT - 4:

Correlation- Scatter diagram, Karlpearson‟s co-efficient and its properties, Spearman's rank correlation coefficient, principle of least squares and fitting of first, second degree and exponential curves,

UNIT -5:

Regression Equations- properties of regression equations, regression lines and concept of error in regression - partial and multiple correlation- concepts. Association of attributes and simple problems.

Suggested Readings

Book for study:

1) Richard I. Levin , David S. Rubin (2008), Statistics for Management Pearson.
2) Goon, AM., Gupta M.K and . Dasgupta B (1991): Fundamentals of Statistics, Vol.1,World Press, Calcutta.
3) M.R. Spiegel (1961): Theory and problems of statistics, Schaum's outline series
4) Bhat B.R, Srivenkataramana T, and Madhava K.S,(1996) Statistics: A Beginner's textVol. I, New Age International (P) Ltd.

Books for Reference:

1) G.U.Yule and M.G. Kendall (1956): An introduction to the theory of Statistics, Charles Griffin.
2) Snedecor .G.W. and Cochran W.G. (1967): Statistical methods, Iowa State University Press.
3) Anderson, T.W. and Sclove SL. (1978): An introduction to statistical analysis of data, Houghton

Miffin co.
4) Croxton FE, and Cowden D.J. (1973) Applied General Statistics, Printice Hall of India.

Course Outcome:
1. Know the uses of statistics in society
2. Organize, manage and present data
3. Analyze the statistical data graphically using frequency distribution and cumulative frequency distribution.
4. Analyze statistical data using measures of central tendency, dispersion and location.

Course Code& Title	**: 1964102/ Mathematics for Statistics– I Semester: I**
Course Type	: Allied
Credits	5
Credit equivalence	: NA
Pre-requisites	: NA

Course Description

Course Content:

UNIT – 1:

Matrix theory-definition and type of matrices, scalar, Elementary, Symmetric, Skew Symmetric, Hermitian, Skew - Hermitian, independent and unitary matrices- algebric operations on matrices and their properties-elementary transformations of matrices -determinant of matrix, definition of a row rank – column rank and rank of a matrix -determination of rank of a matrix.

UNIT – 2:

Inverse of a square matrix – computation of the inverse of the square matrix - solution of linear equations – Homogenous and non-homogenous systems of equations–solutions space – consistency and general solutions Cramer‟s Rule and matrix methods of solving system equations and numerical examples, characteristic equations– root and vectors of a square matrix – left and right eigen vectors – Cayley – Hamilton theorem - quadratic forms, definite, semi definite and indefinite quadratic forms.

UNIT – 3:

Logarithmic differentiation – Differentiation of one function with respect to another function – differentiation from parametric equations – Differentiation of implicit functions- Increasing and decreasing functions.

UNIT – 4:

Successive differentiation – Leibnitz theorem – Partial Differentiation – Maxima and Minima of functions of two variables.

UNIT – 5:

Integration – Properties of definite integrals – Reduction formula – Bernoulli‟s formula.

Suggested Readings:

Books for study:

1) Narayanan and T. K. Manickavachagam Pillai (1996): Calculus (Vol I & II) S.V. Publications.
2) Shanti Narayanan: Differential and Integral Calculus, Chand & Co.

Books for Reference:

1) S.Narayanan and others , Calculus,S.Viswanathan publications.

Course Outcome:

1. Understood the student about characteristic roots and vectors and reductions of quadratic and canonical forms
2. Obtained the knowledge of inverse of a matrix using Cayley Hamilton theorem and definite integrals – Reduction formula

Code& Title/Code	**: Fundamentals of Accounting/1964103**	**Semester : I**
Course Type	**: NME**	**Credits : 2**

Level of Knowledge: Basic Level

UNIT - 1:

Definition of statistics- limitations of statistics – data Types- complete enumeration, observational studies and sample surveys-Presentation by tables and diagrams-Measures of Locations –Measures of Dispersion – Simple Problems.

UNIT - 2:

Correlation- Scatter diagram, Karlpearson‟s co-efficient and its properties, Spearman's rank correlation coefficient, principle of least squares and fitting of first curve-Regression Equations- properties of regression equations, regression lines and concept of error in regression - partial and multiple correlation- concepts. Association of attributes and simple problems.

Suggested Readings Books for Study:

1) Dr.P.R.Vital (2018)-Mathematical Statistics , Margham Publications.
2) SP Gupta (1976) - Statistical Methods - Sulta chand & Sons .

Course Outcome:

1. Acquired the knowledge of uses of statistics in society
2. Obtained the knowledge of organize, manage and present data

Course Code& Title	: 1964204 & Probability and Random variables	Semester : II
Course Type	: Core	Credits 5

Course Description

Course Content :

UNIT - 1:

Random experiment, sample point, sample space, event, algebra of events, operations on events. Classical and relative frequency approach to probability - axiomatic approach to probability, Simple problems.

UNIT –2 :

Addition theorem of probability, conditional probability, independence of events multiplication theorem –Baye"s theorem and its applications.

UNIT –3:

Definition of discrete and continuous random variables - probability mass function, distribution functions and probability density functions and their properties. Expectation of random variables and its properties.

UNIT-4:

Moment generating function, characteristic function, cumulant generating function – their properties, moments, measures of locations, dispersion, Skewness and Kurtosis for discrete and continuous variants-simple problems

UNIT-5:

Bivariate distributions - discrete and continuous type, cumulative distribution function(c,d.f.), and probability mass function (p.m.f) and probability density function (p.d.f.)Marginal and Conditional expectation.

Suggested Readings:

Books for Study:

1. A.M.Mood, F.A. Graybill and D.C. Boes (1974): Introduction to the theory of Statistics, International student ed. McGraw Hill.
2. Hogg, R.V. and Craig, A.T. (2002): Introduction to Mathematical Statistics, 4thed. Academic Press.
3. A.M.Goon, M.K.Gupta and B. Dasgupta (1980): An outline of Statistical theory, Vol. I,6th revised, World Press.

Books for Reference:

1. P.G.Hoel (1971): Introduction to Mathematical Statistics, Asia publishing house.
2. Murry R. Spiegal (1982): Theory and problems of Probability and Statistics, Schaum'soutline series, McGraw Hill.
3. Seymour Lipshutz (1982): Theory and problems of probability, Schaum's outline series, McGraw Hill.
4. K.L.Chung (1983): Elementary probability theory with stochastic processes, Springer International student edition.
5. William.Feller (1968): An introduction to probability theory and its applications, Vol. I, 3rd ed., John Wiley & Sons.

Course Outcome:

1. Identified random experiments in real life data and translate real-world problems into probability models.
2. Understood the use of basic probability rules, including additive and multiplicative laws, independent and mutually exclusive events.
3. Derived the probability density function of transformation of random variables
4. Calculate probabilities, and derive the marginal and conditional distributions of bivariate random variables.

Course Code& Title	: 1964205 & Mathematics for Statistics–II	Semester: II
Course Type	: Allied	
Credits	5	

Course Description

Course Content:

UNIT – 1:

Sets, Operations on sets – real valued functions – countability – real numbers bounds, supremum and infimum – sequence of real numbers – limit inferior and limit superior and limits of real sequences – limit theorems.

UNIT – 2:

Convergence and divergence of series with non-negative terms – alternating series – conditional and absolute convergence – rearrangement of series – test for absolute convergence – summation by parts.

UNIT – 3:

Continuity and derivative – the derivative of a real function – mean value theorems Taylor‟s theorem - concept of uniform continuity – Riemann integrals, sufficient condition for Riemann intergrability, Darboux theorem, fundamental theorem of integral calculus – first mean value theorem.

UNIT – 4:

Improper Riemann integral – Gamma and Beta integrals – multiple integrals – their evaluations using transformations of variables – simple example of multiple, integrals relevant to statistical methods.

UNIT – 5:

Laplace transformation (LT) – definitions, LT of the function t, e^{at}, cos at, sin at, e^{at} cos bt, e^{at} sin bt, transform f ' (t), f "(t)- Inverse LT relating to the above standard functions.

Suggested Readings:

Books for study:

1. D.Somasundram and B.Choudhary (2002): A first course in Mathematical Analysis, Narosa Publishing house.
2. Gold berg, R.R (1970): Method of Real Analysis, Oxford and IBH.

Books for Reference:

1. Narayanan and T. K. Manickavachagam Pillai – Ancillary Mathematics Book II
2. Bartle , R. G &Shebert, D. R. (1982): Introduction to Real Analysis, Wiley Eastern& Sons.
3. Bartle, R.G.Real 1976. Analysis, John Wiley and sons Inc.,
4. Malik, S.C. and Savita Arora (1991). Mathematical Analysis, Wiley Eastern Limited. New Delhi,
5. Sanjay Arora and Bansi (1991). Introduction to Real analysis, Satya Prakashan, New Delhi.
6. W. Rudin (1976): Principles of Mathematical Analysis, 3/e, McGraw Hill company.

Course Outcome:

1. Understood the student about differentiation and integration
2. Obtained the knowledge of relationship between Gamma and Beta function and Laplace transforms and inverse Laplace transforms

Code& Title/Code	**: Basics of Probability/1964207**	**Semester : II**
Course Type	**: NME**	**Credits : 2**

Level of Knowledge: Basic LevelUNIT – I

Definition of Probability, Axioms on Probability, Random Experiment, Sample Points and Sample Space. Event and Operations on events. Classical and relative frequency approach to probability-Axiomatic approach to probability and simple problems.

UNIT-II

Addition theorem of Probability –Conditional Probability, Independence of events- Multiplication theorem-Baye's Theorem (without Proof) Simple problems- Discrete and ContinuousRandom Variable - simple problems (Related to Discrete Random Variable Problems only)

REFERENCE BOOKS:

1. P.R.Vital : Mathematical Statistics, Margham Publications.
2. K.L. Chung (1983) : Elementary Probanbility theory with stochastic processes,Springer International student edition.

Course Outcome:

1. Acquired the knowledge of real life data and translate real-world problems into probability models.
2. Understood the concept of basic probability rules, including additive and multiplicative laws