MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI – 12.

B.Sc. Statistics

under Choice Based Credit System
(with effect from the academic year 2020-2021)

Eligibility for Admission:

Candidates who have passed the higher secondary examination conducted by Government of Tamil Nadu with Statistics / Mathematics / Business Mathematics / Computer Science / Physics / Chemistry / Commerce as one of the courses or other equivalent examinations are eligible for admission to the first year of the B.Sc., (Statistics) degree program.

Duration of the Program:

The duration of the program is three academic years comprising of six semesters with two semesters in each academic year. Examinations will be conducted at the end of each semester for the respective courses.

Medium of Instructions and Examinations:

The medium of instructions and examinations for the courses of Part I and Part II shall be in the languages concerned. For the courses of Part III and Part IV, the medium of instructions and examinations shall be in English.

Examination

The regulations for examination, passing minimum in each course and classification of successful candidates and award of ranks are at par with the regulations for other undergraduate science programs of the University.

SCHEME OF EXAMINATION

Table: CS-03: Common Program Structure for other UG Degree Programme in Sciences – B.Sc., in Statistics

Sem. (1)	Pt. I/II/ III/ IV/ V (2)	Sub No. (3)	Course Status (4)	Course Title (5)	Contract Hrs./week (6)	**L** Hrs. / week (7)	**T** Hrs. / week (8)	**P** Hrs. / week (9)	**C** Credits (10)
I	I	1	Language	Tamil / Other Languages	6	6	0	0	4
	II	2	Language	Communicative English	6	6	0	0	4
	III	3	Core-I	Descriptive Statistics	5	5	0	0	4
	III	4	Major Practical - I	Statistics Practical-I	3	0	0	3	2
	III	5	Add on Major (Mandatory)	Professional English for Physical Sciences-I	4	4	0	0	4
	III	6	Allied - I	Mathematics	4	3	0	0	3
	IV	7	Common	Environmental Studies	2	2	0	0	2
	Subtotal				**30**				**23**
II	I	8	Language	Tamil / Other Languages	6	6	0	0	4
	II	9	Language	English	6	6	0	0	4
	III	10	Core-II	Sampling Techniques	4	4	0	0	4
	III	11	Major Practical - II	Statistics Practical - II	2	0	0	2	2
	III	12	Add on Major (Mandatory)	Professional English for Physical Sciences- II	4	4	0	0	4
	III	13	Allied - II	Programming with C	4	3	0	1	3
	III	14	Allied Practical	Computer Practical	2	0	0	2	2
	IV	15	Common	Value Based Education / சமூகஒழுக்கங்களும் பண்பாட்டுவிழுமியங்களும்/Social Harmony	2	2	0	0	2
	Subtotal				**30**				**25**

Note 1:

Statistics Practical – I : Based on the course "Descriptive Statistics"

Statistics Practical – II : Based on the course "Sampling Techniques"

Computer Practical : Based on the course "Programming with C"

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SYLLABUS

SEMESTER – I

1.1 Tamil / Other Languages

1.2 Communicative English

1.3 DESCRIPTIVE STATISTICS (Core-I)

Unit - I

Origin, scope, limitations and misuses of Statistics – Collection – Classification - Tabulation of data. Types of Data – Nominal, ordinal, Interval and ratio. Diagrammatic presentation of data: one dimensional and two-dimensional diagrams – graphic representation: line diagram, frequency polygon, frequency curve, histogram and Ogive curves.

Unit -II

Measures of central tendency: mean, median, mode, geometric mean and harmonic mean. Partition values: Quartiles, Deciles and Percentiles. Measures of Dispersion: Mean deviation, Quartile deviation and Standard deviation – Coefficient of variation.

Unit- III

Moments - measures of Skewness - Pearson's and Bowley's Coefficients of skewness, Coefficient of Skewness based on moments – co-efficient of Kurtosis.

Unit -IV

Curve fitting: principle of least squares, fitting of the curves of the form $y = a+bx$, $y = a+bx+cx^2$ and Exponential and Growth curves.

Unit- V

Linear correlation - scatter diagram, Pearson's coefficient of correlation, computation of co-efficient of correlation from a bivariate frequency distribution, Rank correlation, Coefficient of concurrent deviation- Regression equations - properties of regression coefficients.

BOOKS FOR STUDY:

1. Anderson, T.W. and Sclove, S.L. (1978) Introduction to Statistical Analysis of data, Houghton Mifflin, Boston.
2. Bhat, B.R., Srivenkataramna, T. and Madhava Rao, K.S. (1996) statistics A Beginner's Text, Vol. I, New Age International, New Delhi.
3. Croxton, F.E. and Cowden, D.J. (1969) Applied General Statistics, Prentice Hall, New Delhi.
4. Goon, A.M., M.K. Gupta and B. Das Gupta (2002) Fundamentals of Statistics- Vol. I. World Press Ltd, Kolkata.
5. Gupta, S.C. and V.K. Kapoor (2002) Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
6. Spiegel, M.R. and Stephens, L. (2010) Statistics, Schaum's Outline Series, Mc Graw Hill, New York.

1.4 Statistics Practical – I

Based on the course "Descriptive Statistics"

1.5 Professional English for Physical Sciences-I

1.6 MATHEMATICS (Allied-I)

Unit - I

Tangent and Normal-Direction of the tangent-Angle of intersection of curves-subtangent and subnormal - Differential coefficient of the length of an arc of $y=f(x)$ - Polar coordinates - Angle between the radius vector and the tangent-Polar subtangent and polar subnormal - Length of arc in polar coordinates.

Unit - II

Method of finding the envelop - Curvature - Circle, radius and centre of curvature - Cartesian formulae - Evolute and Involute - Radius of curvature when the curve is given in polar coordinates.

Unit - III

Multiple integrals - Evaluation of double integrals - Double integral in polar coordinates - Triple integrals - Applications of multiple integrals.

Unit - IV

Infinite integrals - Integrand becoming infinite at certain points in the interval of integration - Beta and Gamma functions - Properties of Beta functions - Relation between Beta and Gamma functions - Evaluation of integrals using Gamma functions.

Unit -V

Differential equations: Standard types of first order and first degree equations. Variagles separable, Homogeneous, Non-homogeneous equationsand Linear equation. Equations of first order but of higher degree.

BOOKS FOR STUDY:

1. Narayanan, S. and ManicavachagomPillay, T.K. (2015) Calculus Vol. I, S.Viswanathan (Printers publishers) Pvt. Ltd., Chennai.
2. Narayanan, S. and ManicavachagomPillay, T.K. (2015) Calculus Vol. III, S.Viswanathan (Printers publishers) Pvt. Ltd., Chennai.
3. Narayanan, S. and ManicavachagomPillay, T.K. (2014) Calculus Vol. II, S.Viswanathan (Printers publishers) Pvt. Ltd., Chennai.

1.7 Environmental Studies - (Common - Part-IV)

SEMESTER – II

2.1 Tamil / Other Languages

2.2 English

2.3 SAMPLING TECHNIQUES(Core-II)

Unit-I

Population, Census method - Need for sampling -Basic concepts of sample surveys - sampling unit - sampling frame - Principal steps involved in sample surveys - Preparation of schedules and questionnaires.

Unit-II

Sampling errors -Bias and standard errors - Mean squared error - Determination of sample size with reference to sampling errors -Non-sampling errors, Sources and types of non-sampling errors -Non-response and response errors.

Unit-III

Simple random sampling method with and without replacement (Lottery method and random number table) - estimation of population parameters - mean, variance and proportion - Simple random sampling for attributes; confidence limits - Determination of sample size.

Unit-IV

Stratified random sampling-principles of stratification - Estimation of population mean and its variance - Allocation techniques (equal allocation, proportional allocation, Neyman allocation and optimum allocation) - Estimation of gain due to stratification

Unit-V

Systematic sampling - Estimation of population mean and its variance - Comparison of simple random, stratified random and systematic sampling.

BOOKS FOR STUDY:

1. William G. Cochran (1990) Sampling Techniques (Third Edition), John Wiley Sons, New York.
2. Sampath, S. (2006) Sampling Theory and Methods (Second Edition), Narosa Publishing House, New Delhi.
3. Daroga Singh and Choudary, F.S.(1986) Theory and Analysis of Sample Survey Designs, New age International publishers, New Delhi.
4. Des Raj and Promod Chandhok (1998) Sample Survey Theory, Narosa Publishing House Pvt. Ltd, New Delhi.
5. Murthy, M.N. (1977) Sampling Theory and Statistical Methods, Statistical Publishing Society, Kolkata.

2.4 STATISTICAL PRACTICAL – II

Based on the course "Sampling Techniques"

2.5 Professional English for Physical Sciences-II

2.6 PROGRAMMING with C (Allied-II)

Unit - I

Introduction to Constants and Variables – Defining symbolic constant - Character set – Keywords and Identifiers – Declaration of Variables – Assigning values to variables – Declaring variable as a constant – Data Types.

Unit - II

Decision Making and Branching: Introduction – Decision making with IF statement – Simple IF statement – The ELSE IF Ladder – GOTO Statement - Decision Making and Looping : WHILE statement – Do Statement – FOR statement – Jumps in LOOPS.

Unit - III

Arrays: One-dimensional Arrays –Two-dimensional Arrays – Multi-dimensional Arrays – Dynamic Arrays - Handling of Character Strings: Declaring and Initializing String Variable – Arithmetic operations on Character – String handling functions.

Unit - IV

User Defined functions: Introduction – Need for User-defined function – Function calls – Function Declaration - Structures and Unions: Defining Structure – Declaring Structure variables – Structures within Structures – Union.

Unit - V

Pointers: Understanding Pointers – Declaring Pointer Variable – Accessing a variable through its Pointer – Pointer Expression - File Management in C: Defining and Opening a File – Closing a File - Input/Output operations on Files – Random access to Files.

BOOKS FOR STUDY:

1. Balagurusamy, E. (2010) Programming in ANSI C (5th Edition), Tata McGraw-Hill Education, New Delhi.
2. Ashok, M. Kamthane (2006) Programming with ANSI and Turbo C, Dorling Kindersley (India) Pvt. Ltd., New Delhi.

2.7 COMPUTER PRACTICAL (Allied Practical-II)

Based on the course "Programming with C"

2.8 Value Based Education - (Common - Part-IV)