P.G AND RESEARCH
DEPARTMENT OF STATISTICS
PERIYAR E.V.R. COLLEGE (AUTONOMOUS)
TIRUCHIRAPPALLI – 620 023.

SYLLABI

M.Phil

From 2018-19 onwards

COURSE STRUCTURE M.Phil STATISTICS (Full Time & Part Time : 2018-2019)

SL. No.			COURSE TITLE	Hrs.	Credits	Internal Exam	External Exam	Total
I – SEMESTER								
1	-	CORE - I	RESEARCH METHODOLOGY		4	40	60	100
2	-	CORE - II	ADVANCED STATISTICAL INFERNCE		4	40	60	100
3	-	CORE - III	ADVANCED APPLIED STATISTICS		4	40	60	100
4	-	CORE - IV	TEACHING AND LEARNING SKILLS		4	40	60	100
			TOTAL		**16**	**160**	**240**	**400**
II – SEMESTER								
5	-	VIVO-VOCE			8	200		200
			TOTAL		**8**			
			GRAND TOTAL		**24**	**160**	**240**	**600**

1. **Dissertation and Viva voce**   **200 Marks**
   Dissertation   150 Marks
   Viva voce   50 Marks

2. **Continuous Internal Assessment (CIA) – 40**

   Test (2 x 10)   20 Marks
   Assignment   10 Marks   **100 Marks**
   Seminar   10 Marks

3. **Term Examination**   **60 Marks**

CORE - I

RESEARCH METHODOLOGY

Note: A candidate has to answer five questions, one from each unit with internal choice

Semester – I
Code: **Credits: 4**

Unit I

An introduction: Meaning- Objective-Motivation in research-Types of Research Significance of Research- Defining the Research Problem- Necessity of defining the problem-Technique involved in defining a problem.

Unit II

Research Design: Meaning and need of Research Design-Features of a good design- Different research designs. Sampling Design: Census and Sample Survey, Implications of a sample design, Steps in sampling design, Criteria of selecting a sampling procedure, Characteristics of a good sample design, Different Types of Sample Design, Select a random sample, Random sample form an Infinite Universe, and Complex Random sampling design.

Unit III

Interpretation and Report Writing: Meaning of Interpretation, Technique of interpretation, Precaution in Interpretation, Significance of Report writing, Different steps in report writing, Layout of the Research Report, Types of reports, Mechanics and precautions for writing a Research Report.

Unit IV

Acceptance quality control and process- Quality Control-Sampling by attributes, Operation, Selections and measures-Sequential sampling by attributes, Selections, Measure.

Sequential sampling for process parameter-Single sampling for Process Parameter-Acceptance control, Sequential plan for process parameter (Known and Unknown)

Unit V

Stochastic Processes, State Space and Parameter Space, Markov Process, Markov Chain, Poisson Process, Time Dependent Poisson Process, Pure Birth Process, Yule Process, Discrete Branching Process, Pure Death Process and Birth and Death Process.

Books for Study and Reference :

1. Kothari C.R: Research Methodology, New Age International Publishers, Chennai.
2. Montgomery, D.C: Introduction to Statistical Quality Control, John Wiley and Sons, New Delhi.
3. J. Medhi (2009): Stochastic Process, Wiley Eastern.
4. Karlin, S and H.W. Taylar (1975): a First Course in Stochastic Processes, Academic Press.
5. U.N Bhat: Stochastic Process.

CORE - II

ADVANCED STATISTICAL INFERENCE

Note: A candidate has to answer five questions, one from each unit with internal choice.

Semester – I

Code: **Credits: 4**

Unit I

Sufficient Statistics, Existence and construction of Minimal Sufficient Statistics, Sufficient and completeness, Sufficiency and invariance, Minimum Variance Unbiased Estimation, Unbiased estimation of location and scale parameters.

Unit II

Maximum Likelihood Estimator, Strong consistency , asymptotic efficiency of maximum likelihood estimators and best asymptotically normal estimators.

Unit III

Neyman-Pearson Fundamental Lemma, Distribution in Monotone Likelihood Ratio test, confidence bounds, UMP tests for the two sided hypothesis, test for parameters in a normal distribution.

Unit IV

Unbiased tests-Concept of unbiasedness, Application of one parameter exponential family, Similarity and completeness, Uniformly Most Powerful Unbiased tests for multi parameter exponential families, Comparisons of two Poisson and Binomial populations and applications of unbiasedness.

Unit V

Bayesian testing of hypothesis, Specification of the appropriate form of the prior distribution for a Bayesian testing of hypothesis problem, prior odds, posterior odds, Bayes factor for a various types of testing hypothesis problem depending upon whether the null hypothesis and alternative hypothesis are simple or composite. Specification of the Bayes tests in the above cases. Discussion of Lindley paradox for testing a point hypothesis for normal mean against the two sided alternative hypothesis.

Books for Study :

1. E.L Lehaman: Theory of Point Estimation, John Wiley & Sons, (Chapter 1 and 2).

2. E.L Lehaman: Testing of Statistical hypothesis, John Wiley & Sons.

3. S.Zacks: Theory of Statistical Inference, John Wiley & Sons. (Chapter2,3 &5).

4. Ferguson(1967): Mathematical Statistics-a decision approach, Academic Press.

CORE-III

ADVANCED APPLIED STATISTICS

Note: A candidate has to answer five questions, one from each unit with internal choice.

Semester – I

Code: **Credits: 4**

Unit I

Basic concepts of quality, total quality management, quality assurance, Control charts for Variables and attributes with fixed and variable sample sizes, natural tolerance limits and specification limits, Modified control limits, CUSUM control charts, exponentially weighted moving average control charts, Mid-range and moving control charts, average run length curve and V-Mask.

Unit II

Acceptance sampling by attributes and variables, Merits and demerits, Double, Sequential, Multiple sampling plans. Military Standard 105E, Dodge-Roming sampling plans, Lot tolerance tables.

Designing a variables sampling plan with a specified OC Curve. Shanin lot plot method. Military standard for inspection by variables(MIL STD 414), Chain Sampling , Continuous Sampling Plans and Skip-Lot sampling plans.

Unit III

Finite group and Finite field, finite geometry, projective and Euclidean, Contribution of complete set of mols, Lattice designs and their analysis, construction of BIBDs using mols, finite geometry and difference method of lose, inter and intra-block analyses of a BIBD.

Unit IV

Two associate PBIB designs, association scheme and inter-block analysis, group divisible designs, dual and linked block designs, resolvable designs, general row-column designs-connectedness and inter-block analysis.

Unit V

Indices of Demographic Characteristics, Crude Death Rates, Age-Sex Specific Death Rates, Infant Mortality Rates, Neonatal and Perinatal Mortality Rates. Standardization of Mortality Rates. Life Table, Various Columns, relationship among Different Mortality Rates. Abridged Life table, Different Methods of Construction of Complete Life Table and Abridge Life Table.

Books for Study

1. Montgomery, D.C- Introduction to Statistical Quality Control: John Wiley and Sons, New Delhi.
2. Mahajan, M- Statistical Quality Control-Dhanpat Raj & Co. Pvt. Ltd., Delhi.
3. Douglas C. Montgomery, (1996): Designs and Analysis of Experiments. John Wiley & Sons.
4. Bose, R.C and Shimamoto, T(1952, 1973): Classification and analysis of PBIB Designs with two associate classes. Jouv. Amer. State Vol.47, PP. 151-184.
5. Suddhendhu Biswas Stochastic Process & Its Applications in Demography.

CORE IV

TEACHING AND LEARNING SKILLS

Note: A candidate has to answer five questions, one from each unit with internal choice.

Semester – I

Code: **Credits: 4**

Objectives :

After completing the course, scholars will be able to:

- Acquaint different parts of computer system and their functions.
- Understand the operations and use of computers and common accessories.
- Develop skills of ICT and apply them in teaching learning context and Research.
- Appreciate the role of ICT in teaching, learning and Research.
- Acquire the knowledge of communication skill with special reference in its elements, types, development and styles.
- Understand the term communication Technology and computer mediated teaching and develop multimedia/E-content in the respective subject.
- Understand the communication process through the web.
- Acquire the knowledge of Instructional Technology and its applications.
- Develop different teaching skills for putting the content across to targeted audience.

Unit I : Computer Applications Skills

Computer system: Characteristics, Parts and their functions-Different generations of computer Operation of computer; switching on/off/restart, Mouse control, use of key board and some functions of key-information and communication Technology(ICT): Definition, Meaning, Features, Trends-Integration of ICT in teaching and learning – ICT applications; using word processors, Spread sheets, power point slides in the classroom-ICT for Research: On-line journals, e-books, Courseware, Tutorials, Technical reports, Thesis and Dissertations.

Unit II : Communication Skills

Communication: Definition- Elements of Communication: Sender, Message, Channel, Receiver, Feedback and Noise-Types of Communication: Spoken and Written: Non-Verbal Communication-Intrapersonal, Interpersonal, Group and Mass Communication-Barriers to communication: Mechnical, Physical, Linguistic & Cultural-Skills of communication: Listening, Speaking, Reading and Writing-Methods of developing fluency in oral and written communication-Style, diction and Vocabulary-Classroom communication and dynamics.

Unit III : Communication Technology

Communication Technology: Bases, Trends and Developments-Skills of using communication Technology-computer Mediated Teaching: Multimedia, E-content-Satellite-based communication: EDUSAT and ETV Channels. Communication through web: Audio and Video applications on the internet, interpersonal communication through the web.

Unit IV : Pedagogy

Instructional Technology: Definition, Objectives and Types-Difference between teaching and Instruction-Lecture Technique: Steps, Planning of a lecture, Delivery of a Lecture-Narration in tune with the nature of different disciplines-Lecture with power point presentation-Versatility of Lecture technique-Demonstration: Characteristics, Principles, Planning Implementation and Evaluation-Teaching –learning Techniques: Team Teaching, Group discussion, Seminar, Workshop, Symposium and Panel Discussion-Modes of teaching: CAI, CMI and WBI.

Unit V : Teaching Skills

Teaching Skill: Definition, Meaning and Nature-Types of Teaching Skills: Skills of Set induction, Skill of stimulus Variation, Skill of Explaining, Skill of Probing Questions, Skill of Black Board Writing and Skill of Closure – Integration of Teaching Skills- Evaluation of Teaching Skills.

Books for Study:

Bela Rani Sharma(2007), Curriculum Reforms and Teaching Methods, Sarup and Sons, New Delhi.

Don Skinner(2005), Teacher Training, Ediinburg University Press Ltd., Edinburgh.

Information and Communication Technology in Education: A Curriculum for Schools and Programme of Teacher development, Jonathan Anderson and Tom Van Weart, UNESCO, 2002.

Kumar, K.L(2002): Educational Technology, New Age International Publishers, New Delhi.

Mangal, S.K(2002): Essential of Teaching-Learning and Information Technology, Tandon Publications, Ludhiana.

Michael, D and William(2000): Integrating Technology into Teaching and Learning: Concepts and Applications, Prentice Hall, New York.

Pandey, S.K(2005): Teaching Communication, Commonwealth Publishers, New Delhi.

Ram Babu, A and Dandapani, S(2006): Microteacing (Vol. 1 and 2), Neelkamal Publications, Hyderabad.

Singh V.K and Sudarshan K.N(1996): Computer Education, Discovery Publishing Company, New York.

Sharma, R.A(2006): Fundamentals of Educational Technology, Surya Publications, Meerut.

Vanaja, M and Rajasekar, S(2006), Computer Education, Neelkamal Publications, Hyderabad.