

SEMESTER –I

Paper –711

(STATISTICAL INFERENCE)

Theory –Compulsory

Marks –80 + 20 (4 CH)

Unit-I

Sufficiency and Completeness :

Sufficient statistics, Fisher's information measure, Minimal sufficient statistics, Complete Statistics, Exponential families of distribution, Pitman families of distribution.

Testing of Statistical hypothesis :

Generalised Neyman-Pearson(GNP) Lemma, Tests of One Parameter Exponential Family of distributions, Locally most powerful tests, UMPU Tests for multi-parameter exponential family of distributions.

Unit-II

Bayesian Approach :

Prior and posterior distributions, Non-informative priors, Point estimation, Hypothesis testing, Decision theory approach.

Unit-III

Non-Parametric Methods :

Nonparametric Estimation- Empirical distribution function, U-Statistics.
Non Parametric tests – Single sample problems, Two sample problems, K-sample problems, Asymptotic Relative Efficiency(ARE)

Unit-IV

Likelihood Ratio Methods and Sequential Procedure:

Likelihood Ratio Test, Asymptotic distribution of Likelihood Ratio Test Criterion, Likelihood Ratio test for categorical data, Test for consistency.

Sequential probability ratio test(SPRT), Operating Characteristic(OC) and Average Sample Number Number(ASN) function of SPRT, Properties of SPRT, SPRT for Composite Hypothesis.

Text Books :

1. Rao, C.R - Linear Statistical Inference and its Applications : John Wiley & Sons.
2. Rajagopalan, M. Dhanavanthan, P - Statistical Inference : PHI Learning(P) Ltd.

Suggested Readings :

1. Mood A.M, Gragbill F.A. and Boes D.C – Introduction to Theory of Statistics, McGrawHill.
2. Goon, A.M., Gupta, M.K. and Dasgupta, B. : An Outline of Statistical Theory, Vol.-II, World Press.

SEMESTER SYSTEM OF Ph.D STATISTICS

SEMESTER –I

Paper –712

(Research Methodology - I)

Theory –Compulsory

Marks –80 + 20 (4 CH)

UNIT –I : SCOPE OF RESEARCH AND ETHICS:

Introduction and Scope

Research problem: Identification, Selection, Formulation of research objectives Research design: Components, Types and Importance

Research ethics, Institutional ethics committee Plagiarism –Pitfall

UNIT –II: TECHNICAL WRITING:

Types of technical documents; Full length research paper, Short / Brief communications, Letters to editor, Book chapter, Review, Conference report, Project proposal

Components of a full length research paper; Title / Topic statement, Abstract/key words, Aims and objectives, Hypothesis building, Rationale of the paper, Work plan, Materials and methodology, Results and discussion, Key issue and arguments, Acknowledgement, Conflict of interest statement, bibliography, Technical Resumes & Cover Letters

Components of a research proposal; Project summary Key words, Origin of the proposal, Major Objectives Methodology, Instrument facility available in the PI's department, Overview of status of Research and Development in the subject, Importance of the proposed project in the context of current status, Bibliography

UNIT –III: SCIENTOMETRICS:

How to cite and how to do referencing

Literature search technique, using SCOPUS, Google Scholar, PUBMED, Web of Science, Indian Citation Index, and RG

Styles of referencing; APA, MLA, Oxford, Harvard, Chicago

Annotated bibliography

Tools for citing and referencing, Grammarly, Endnote etc

UNIT –IV: PRESENTATION AND COMMUNICATION SKILLS:

Tables, Figures and Pictures using

Excel PowerPoint slide preparation

Preparation of Posters

Electronic submission of manuscripts

Communication skills, oral and poster

SEMESTER SYSTEM OF Ph.D STATISTICS

SEMESTER –I

Paper –713

(Research Methodology - II)

Theory –Compulsory

Marks –80 + 20 (4 CH)

UNIT –I : IPR AND CYBER LAW:

Patents

Patent laws, process of patenting a research finding

Intellectual property (IP), Intellectual property right (IPR)

Copyright, Trademarks, GI

Cyber laws

COPE

UNIT –II: QUANTITATIVE DATA ANALYSES:

Types of data, Data collection - Methods and Tools

Hypothesis testing

Normal and Binomial distributions and their property

Tests of significance: Student t-test, F-test, Chi-square test

Correlation and Regression

ANOVA - One-way and Two-way, Multiple-range test

UNIT –III: COMPUTER FUNDAMENTALS:

Introduction to MS-Office software: MS-Word (Track change)

MS-Excel

MS-Power Point

MS-Access

Features for Statistical data analysis using computers and software

Microsoft Excel Data Analysis Tool Pak, SPSS

UNIT – IV: Basic Introduction to MATLAB Language, System Introduction Command Window Operations, array Manipulation and Data handling MATLAB Operators Symbolic Math Tool Box, 2-D plotting , Script Files, Functions and Function Files, MATLAB Programming, 3-D Plots, Numerical Methods using MATLAB.

Recommended Books:

BK Sharma

Instrumental methods of analysis

Buranen L and Roy AM

Perspectives on Plagiarism and Intellectual Property in a Post-Modern world.

Cassel P et al.

Inside M.S Office Professional

Chatwal and Chatwal

Instrumentation

Mastering Internets

Coleman P and
Dyson P

CR Kothari	Research Methodology: Methods & Technique 2008
Gilmore B	Plagiarism: why it happens, How to prevent it?
Gralia P	How the Internet works.
Habraken J	M.S Office 2003 All in One, M.S Office 2010 in Depth
Kumar Anupa P	Cyber Law
R Panneerselvam	Research Methodology
Rudra Pratap	Getting started with MATLAB : A quick introduction for Scientists and Engineers, Oxford Univ. Press 2002.
A. Gilat	MATLAB- An introduction with Applications, wiley, 2004
Snedecor GW & Cochran WG	Statistical Methods
Sood V	Cyber Law Simplified
Sumner M	Computers: Concepts & Uses
Upadhyaya and Upadhyaya	Instrumentation
White R	How Computers Work.

Paper – 714

Marks –150 + 25+25 (8 CH)

DISSERTATION

(Thesis + Seminar Presentation of the Thesis + Viva –Voce)

The students will start their dissertation project in consultation with their supervisors for the beginning of the semester-I, but the thesis will be submitted by 15th December i.e. towards the end of the semester –II . The M.Phil scholar shall submit three copies and soft copy of the final dissertation (One copy to be obtained by the department) by 15th of December of the relevant year. The dissertation shall be examined by the examiners, one External and one Internal. The supervisor shall be the Internal Examiner. The evaluation of dissertation shall be followed by viva-voce.