

SEMESTER SYSTEM OF M.PHIL MATHEMATICS

SEMESTER – I

Paper – 611

(Recent Trends in Mathematics)

Theory – Compulsory

Marks – 80 + 20 (4 CH)

UNIT-I: SYMMETRY: Orthogonal Matrices and Rotations, Symmetry of Plane figures, The Group of Motions of the plane, Finite Groups of Motions, Finite subgroups of the Rotation Group.

UNIT-II: BILINEAR FORMS: Definition, Symmetric forms, The Geometry Assaisted to a positive form, Hermitian forms: The Spectral Theorem, The Spectral Theorem for Normal operators, Skew symmetric forms.

UNIT-III: THEORY OF PRIMITIVE ROOTS AND INDICES: The order of an Integer Modulo n , Primitive Roots for Primes, Primitive Roots for Composite Numbers, The Theory of Indices.

UNIT-IV: CRYPTOGRAPHY: From Caesar cipher to public key cryptography, The Knapsack cryptosystem, an Application of Primitive Roots to cryptography.

Books for Reference :-

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|----------------------|---|--|
| 1. M.Artin | Algebra | Prentica Hall |
| 2. I.N.Herstein | Topics in Algebra | Vikas Publications |
| 3. M.A.Armstrong | Groups and Symmetry | Springer |
| 4. Tom M.Apostol | Introduction to
Analytic Number Theory | Narosa Publication House |
| 5. David M. Burtan | Elementary Number
Theory | Tata Mc Graw-Hill Publishing
Company Ltd. |
| 6. William Stallings | Cryptography and
Network security
Principles and Practice | Pearson |
| 7. Mathew | Theory of Numbers | Pearson |

SEMESTER SYSTEM OF M.PHIL MATHEMATICS

SEMESTER – I

Paper – 612

(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

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SEMESTER – I

Paper – 613

(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
Coleman P and Dyson P	Mastering Internets

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.

SEMESTER SYSTEM OF M.PHIL MATHEMATICS

SEMESTER – I

Paper – 614

Marks – 100 (4 CH)

TEACHING ASSIGNMENT

Each candidate will be assigned at least 10 seminars. In addition to this he/she will have to take at least 10 classes of the UG/PG students. This will be evaluated by the teachers of the department (Minimum two teachers) as well as the feedback, received from the students.

SEMESTER – II

Paper – 621

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.