SRI CHANDRASEKHARENDRA SARASWATHI VISWA MAHAVIDYALAYA

(University u/s 3 of UGC Act 1956) (Accredited with "A" Grade by NAAC) Enathur, Kanchipuram – 631 561. Tamilnadu, www.kanchiuniv.ac.in



DEPARTMENT OF MATHEMATICS

M.Phil., (Mathematics) Syllabus

With effect from 2018-2019

<u>M.Phi., (Mathematics) Curriculum and Syllabus</u> (Effective from 2018-2019)

Semester	Paper	Sub Code	Internal Marks	External Marks	Total Marks	Credits
	Research Methodology	MPM13	40	60	100	4
I	Advanced Applied Mathematics	MPM11	40	60	100	4
п	Probability and Stochastic Processes	MPM12	40	60	100	4
11	Dissertation		-	-	150	18
	Viva		-	-	50	
Total Mar	ks : 500					
Total Cre	dits: 30					

Subject	Subject	Credit/Hrs.	Duration of	Marks		Total
Code		per week	University Exam	CIA	External Exam	Marks
MPM11	Advanced Applied Mathematics	4/5	3 hours	40	60	100

UNIT-I

Calculus of variation-Euler's equation - Solutions of Euler's equation-Geodesics-Isometric problem-several independent variables-Functionals involving higher order derivatives Approximate solution of boundary value problem.

UNIT-II

Application of partial differential equations-Method of separation of variables –Vibration of a stretched string: Wave equation –solution of wave equation –D'Alembert's solution of wave equation-One dimensional heat flow-Solution of heat equation-Two dimensional heat flowSolution of Laplace equation: temperature distribution in long plates, Temperature distribution in long plates.

UNIT-III

Application of Linear differential equations-Simple harmonic motion-Simple pendulum-Gain and loss of oscillations-Oscillations of a spring: Free oscillations, Damped oscillations, forced oscillations (without damping)-Forced oscillations(with damping)-Oscillatory electrical circuits Electro-Mechanical analogy-Deflection of beams-Whirling of shafts-Application of simultaneous equations.

UNIT-IV

Integral Equations-Relation to a system of algebraic equations-Fredhom equation-Method of successive approximations Volterra Equation.

UNIT-V

Z-transforms- Standard forms-Linear property-Damping rule-Shifting rules-Multiplication by initial and final value theorem-inverse Z transforms –Convolution theorem-Convergence of Z-transforms-evaluation of inverse Z-transforms: Power series method-Partial fraction method inversion integral method-Application to difference equation.

Text Books:

 Grewal B.S. Higher Engineering Mathematics, 41st Edition ,Khanna Publishers, 2011
M.K. Venkataramanan, Higher Engineering Mathematics for Engineers for Engineers, National Publishing Company.

References:

- 1. Erwin Kreyszing, Advanced Engineering Mathematics, Wiley Eastern Publishers.
- 2. M.R.Soeugek, Advanced Mathematics for Engineers and Scientists, McGraw Hill.
- 3. M.D. Raisighania, Integral Transforms, S.Chand & Co., New Delhi

Subject	Subject	Credit/Hrs.	Duration of	Marks		Total Marks
Code		per week	University Exam	CIA	External Exam	
MPM	Probability and Stochastic Processes	4/5	3hours	40	60	100

UNIT-I

Probability – Conditional Probability – Independent events – Bayes theorem – Random variable – Discrete random variable – Continuous random variable – Moment generating function.

UNIT-II

Special discrete distributions - Binomial distribution – Poisson distribution – Geometric distribution – Special continuous distributions – Uniform distribution – Exponential distribution – Normal distribution.

UNIT-III

Stochastic process – Classification of stochastic process – Average values of stochastic process – Markov process – Markov chain – Chapman Kolmogorov theorem – Classification of states of Markov chain

UNIT-IV

Poisson process – Probability law for Poisson process – Homogenous Poisson process – Second order probability function of a homogenous Poisson process – Mean and autocorrelation of the Poisson process – Properties of Poisson process.

UNIT-V

Queuing theory – Symbolic representation of a Queuing model – Characteristics of infinite capacity – single server Poisson queue model I-[(M/M/I):(∞ / FIFO) model] – characteristics of Infinite capacity , Multiplier server Poisson queue model II-[(M/M/s):(∞ FIFO) model] – Characteristics of finite capacity, single server Poisson queue model III-[(M/M/s):(∞ FIFO) model] – Characteristics of finite capacity, single server Poisson queue model III-[(M/M/s):(∞ FIFO) model] – Characteristics of finite capacity, single server Poisson queue model III-[(M/M/s):(∞ FIFO) model] – Characteristics of finite capacity, single server Poisson queue model III-[(M/M/I):(k/FIFO) model]-

Text Books:

Fundamentals of Mathematical Statistics, S.K.Gupta, V.K.Kapoor, Sultan Chand & Sons,

Stochastic Process – J. Medhi, New Age International (P) Ltd publications

Probability, Statistics and Random process- T.Veerarajan, Tata McGraw Hill Education Private Limited, Third edition.

Reference books

1. Gupta S.P, Statistical methods, Sultan Chand & Sons, 2005.

2. Gubner A. John, Probability and random process for electrical and computer engineers, Cambridge University Press, first edition, 2006.

3. A.K.Basu, Inttroduction to Stochastic Process, Narosa Publishing House, 2005.

4. Kishore S. Trivedi, Probability & Statistics with Reliability, queuing, and computer science applications, PHI learning private limited, 1984.

5. P.Kandasamy, K. Thilagavathi, K.Gunavathi, Probability Statistics and Queueing Theory, S.Chand Publications, First Edition, 2013.

Subject	Subject	Credit/Hrs.	Duration of	Marks		Total Marks
Code		per week	University Exam	CIA	External Exam	
МРМ	Research Methodology	4/5	3 hours	40	60	100

Unit-I

An Introduction : Meaning of Research-Objectives of Research , Motivation in Research-Types of Research, Research Approaches-Significance of Research, Research Methods versus Methodology-Research and Scientific Method, Importance of knowing How Research is Done-Research Process , Criteria of Good Research, Problems Encountered by Researchers in India Defining the Research problem :Selecting the Problem, Necessity of Defining the Problem, Technique involved in defining a problem.

Unit-II

Research Design: Meaning of Research Design, Need for Research Design, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental 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 Designs, Random sample from an infinite universe, Complex random sampling Designs.

Unit-III

Measurement and scaling Techniques: Measurement in Research, Measurement scales, Sources of Error in Measurement, Tests of sound Measurement, Technique of Developing Measurement Tools, scaling ,Meaning of scaling, scale classification Bases, Important scaling Techniques, Scale construction Techniques.

Unit-IV

Method of data collection: Collection of primary data, observation Method , interview Method, Collection of Data through Questionnaires, collection of data through schedules ,Difference between Questionnaires and schedules, Some other Methods of data collection, Collection of secondary data. Selection of Appropriate Method for data collection, case study method.

Unit-V

Interpretation and Report writing: Meaning of Interpretation Technique of Interpretation, Precaution in Interpretation, Significance of Report writing, Difference steps in Writing Report, Layout of the Research Report, Types of Reports, Oral Presentation, Mechanics of Writing a Computer Report, Precautions for Writing Research Reports. The computer: Its Role in Research: Introduction, The computer and computer Technology, The computer system, Important Characteristics, The Binary Number system ,Computer Applications, Computer and Research.

PRESCRIBED TEXT BOOK:

Research Methodology (second Revised Edition) – C.R.Kothari ; New Age Publishers,2004 REFERENCES

1. How To Get a Research Degree-Elphinstone and Schweitzer

2. Fundamentals of Research Methodology and statistics – Yogesh Singh.