ALLIED MATHEMATICAL STATISTICS-I

Semester	Subject Code	Category	Lecture		Theory		Practical	Credits
I	21CAST1A	Allied	Hrs/week	Hrs/Sem	Hrs/week	Hrs/Sem	0	4
			4	60	4	60		

COURSE OBJECTIVE:

The students will be able to

- Comprehend the fundamental concepts in Statistics.
- Recognize the fundamental meanings of correlation and regression.

COURSE OUTCOMES:

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	Understand Addition and Multiplication laws of Probability, Independence of Events, Conditional Probability and Baye's theorem	K3
CO2	Acquire knowledge about Random Variables, Expectation, Moments and to solve problems	K2
CO3	Learn about Moment Generating Function,Characteristic Function, Properties, Inversion and Uniqueness Theorem	K3
CO4	Gain knowledge aboutCorrelation, Karl Pearson's Coefficient of Correlation and Rank Correlation.	K3
CO5	Apply Regression for the investigation of relationship between the variables	K3

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

MAPPING OF PROGRAM OUTCOMES

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	S	M	S
CO2	S	S	S	S	S	S
CO3	M	S	M	M	S	S
CO4	S	S	M	S	M	S
CO5	S	S	M	S	S	S

S- Strong; M-Medium; L-Low

UNIT- I : THEORY OF PROBABILITY **12 Hours**

Basic Terminology- Mathematical Probability- Statistical Probability – Axiomatic Probability - Some Theorems on Probability – Addition Theorem of Probability – Extension of Addition Theorem of Probability to n Events – Boole's Inequality - Conditional Probability - Multiplication Theorem of Probability – Independent Events – Bayes' Theorem- Simple Problems.

UNIT- II : RANDOM VARIABLES AND DISTRIBUTION FUNCTIONS 12 Hours

Introduction – Distribution Function-Discrete Random Variable- Continuous Random Variable–Two Dimensional Random Variables – Joint Probability Mass Function – Two Dimensional Distribution Function – Marginal Distribution Functions – Joint Density Function, Marginal Density Function - Conditional Distribution Function and Conditional Probability Density Function –Mathematical Expectation – Expected Value of function of a Random Variable – Properties of Expectation – Properties of Variance – Covariance - Simple Problems.

UNIT– III: MOMENT GENERATING AND CHARACTERISTIC FUNCTIONS 12 Hours

Moment Generating Function -Characteristic Function – Properties of Characteristic Function – Some Important Theorems- Inversion Theorem (Levy Theorem - Statement only)- Uniqueness Theorem of characteristic Function (Statement only) – Simple problems.

UNIT- IV: CORRELATION **12 Hours**

Introduction – Meaning of Correlation - Scatter Diagram - Karl Pearson's Coefficient of Correlation - Calculation of the Correlation Coefficient for a Bivariate Frequency Distribution - Rank Correlation- Simple Problems.

UNIT – V- LINEAR AND CURVILINEAR REGRESSION **12 Hours**

Introduction-Linear Regression – Curvilinear Regression-Regression Curves-Simple Problems.

DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%

TEXT BOOK

S.No	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	S. C. Gupta & V.K Kapoor	Fundamentals of Mathematical Statistics	Sultan & Sons.	1974

REFERENCE BOOKS

S.No	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	Hogg, R.V. &Craig.A	Introduction to Mathematical Statistics	Macmillan	1998
2	Mood.A.MGraybill.F.A. &Boes.D.G	Introduction to Theory of Statistics	McGraw Hill	1974
3	Wilks S.S	Elementary Statistics Analysis.	Oxford and IBH	-
4	Snedecor. G. W &Cochran.W.G	Statistical Methods	Oxford and IBH	1967
5	Hoel,P.G(1971)	Introduction to Mathematical Statistics	Wiley.	1971

WEB RESOURCES

1. *www.statisticssolutions.com/correlation-pearson-kendall-spearman/*
2. *http://www.srmuniv.ac.in/sites/default/files/downloads/CORRELATION.pdf*
3. *https://towardsdatascience.com/linear-regression-detailed-view-ea73175f6e86*

TEACHING METHODOLOGY

1. Black Board Teaching
2. Smart Board Class Teaching
3. Giving Assignments for each units
4. Class room Discussions and seminars.
5. PPT Presentations.

SYLLABUS DESIGNERS

1. Dr. M. Devi, Assistant Professor of Mathematics.
2. Mrs.R. Ramya, Assistant Professor of Mathematics.