

**SEMESTER-7**

<b>MA0471</b>	<b>Linear Algebra and Statistics</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
<b>(ECE)</b>					

**Purpose:**

To develop an understanding of the methods of probability and statistics which are used to model engineering problems.

**Instructional objectives:**

1	To learn about vector space and linear transformations
2	To learn about inner product space
3	To have knowledge in regression and correlation .
4	To learn about testing of hypothesis
5	To learn about ANOVA

**UNIT I VECTOR SPACE AND LINEAR TRANSFORMATION**

Vector space-Subspaces-Linear combination, Linear span-Linear independence and dependence-Basis and Dimension-Algebra of linear transformations. .(Theorems without proof) **(12 Hours)**

**UNIT II INNER PRODUCT SPACE**

Inner product space-Normed Vector Space-Orthogonality-Grahm-Schmidt Orthogonalisation Process. (Theorems without proof) **(12 Hours)**

**UNIT III REGRESSION AND CORRELATION**

Regression methods - Principle of least squares - Correlation - Multiple and Partial correlation - Linear and non-linear regression - Multiple linear regression. **(12 Hours)**

**UNIT IV TESTING OF HYPOTHESES**

Large sample tests based on Normal Distribution – Small sample tests based on t, F distributions – Chi square tests for goodness of fit and independence of attributes. **(12 Hours)**

**UNIT V ANALYSIS OF VARIANCES**

Introduction to test based on F-distribution - One way and Two way classification of ANOVA - Completely Randomised Design - Randomised Block Design - Latin square Design **(12 Hours)**

**TEXT BOOKS:**

1. S.C.Gupta & V.K.Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand and Sons, New Delhi, 11<sup>th</sup> edition, 2007.
2. K.S.Narayanan and T.K.Manicavachagam Pillai, S.Viswanathan “Modern Algebra. Vo II”(Printers & Publisher)1983.

**REFERENCES:**

1. Dr.S.Kandasamy & others S.Chand, ”Engineering Maths (Vol III)”, Delhi, April-2005.
2. S.C.Gupta & V.K.Kapoor, Fundamentals of Applied Statistics, Sultan Chand and Sons, New Delhi, 2003.
3. W. Ewans & G.Grant, Statistical Methods in Bio informatics - An Introduction

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<b>MA0471 - Linear Algebra and Statistics</b>												
Course designed by		Department of Mathematics										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X				X						
2	Mapping of instructional objectives with student outcome	1-5				1-5						
3	Category	General (G)			Basic Sciences (B)			Engineering Sciences and Technical Arts (E)		Professional Subjects (P)		
					X							
4	Broad Area	Structural Engineering			Geotechnical Engineering			Water Resources Engineering		Geomatics Engineering		
5	Approval	23 <sup>rd</sup> meeting of academic council, May 2013										

**Note:**

- 1. Instructional objectives (IO) shall be to the point and numbered; not more than five IOs shall be listed and they shall be mapped with the student outcomes.**
- 2. For reference, the list of student outcomes are given below. For each course appropriate outcomes shall be chosen**
  - (a) an ability to apply knowledge of mathematics, science, and engineering
  - (b) an ability to design and conduct experiments, as well as to analyze and interpret data
  - (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
  - (d) an ability to function on multidisciplinary teams
  - (e) an ability to identify, formulate, and solve engineering problems
  - (f) an understanding of professional and ethical responsibility
  - (g) an ability to communicate effectively

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- (h) the broad education necessary to understand the impact of engineering solutions in global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.