ALGEBRA-I

Semester	Subject Code	Category	Lecture		Theory		Practical	Credits
I	21CPMA1A	Core	Hrs/ week	Hrs/ Sem	Hrs/ week	Hrs/ Sem	0	4
			6	90	6	90		

COURSE OBJECTIVES

The students will be able to

- Introduce the concept of class equation, Solvability of Groups, Finite Abelian Groups, Linear Transformations and Real Quadratic Forms.
- Develop the knowledge on Trace and Transpose, Jordan forms.

COURSE OUTCOMES:

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

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	Explain the concept of Sylow's theorem	K2
CO2	Acquire the information on fields, vector spaces and modules	K3
CO3	Explain and evaluate the concept of canonical transformations such as triangular and nilpotent	K4
CO4	Apply the Jordan form and rational canonical form for problem solving	K3
CO5	Analyze the topics Trace, Transpose, Hermitian etc.	K4

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

MAPPING WITH PROGRAMME OUTCOMES:

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

S- Strong; M-Medium; L-Low

UNIT - I - GROUP THEORY   **18 Hours**

Another Counting Principle – Class Equation for Finite groups and its applications – Sylow's theorems [For theorem 2.12.1, Only First proof].

Chapter 2: Sections 2.11 and 2.12 [Omit Lemma 2.12.5]

UNIT - II - GROUP THEORY (Continued)   **18 Hours**

Direct products – Finite Abelian Groups – Modules.

Chapter 2: Sections 2.13 and 2.14 [Only Theorem 2.14.1]

UNIT - III – MODULES AND FIELDS   **18 Hours**

Modules - Construction with Straightedge and Compass.

Chapter 4: Section4.5
Chapter 5: Section5.4

UNIT - IV - LINEAR TRANSFORMATIONS   **18 Hours**

Linear Transformations: Canonical Forms - Triangular form - Nilpotent transformations- Jordan form - Rational Canonical Form - Trace and Transpose.

Chapter 6: Sections 6.4, 6.5, 6.6, 6.7 and 6.8

UNIT - V - LINEAR TRANSFORMATIONS (Continued)   **18 Hours**

Hermitian, Unitary and Normal Transformations - Real Quadratic Forms.

Chapter 6:6.10 and 6.11
DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%

TEXT BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	I.N.Herstein	Topics in Algebra	Wesley Wiley Eastern Limited, New Delhi	1975, II Edition

REFERENCE BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	M.Artin	Algebra	Prentice Hall of India	1991
2	P.B.Bhattacharya, S.K.Jain, and S.R.Nagpaul	Basic Abstract Algebra	Cambridge University Press	1997
3	Rudin, W I.S. Luther and I.B.S.Passi	Algebra, Vol. I- Groups and Vol.II, Rings	Narosa Publishing House, New Delhi	1999.

Web Sources:

1. abstact.ups.edu>aata-20160809.

Teaching Methodology

1. Class room Teaching

2. Assignments

3. Seminars

4. Discussions

5. PPT Presentations

SYLLABUS DESIGNER:

1. Mrs.B.Sarala, Assistant Professor of Mathematics.

2. Dr.M.Kasthuri, Assistant Professor of Mathematics.