CORE PAPER –VI - ABSTRACT ALGEBRA

Semester	Subject Code	Category	Lecture		Theory		Practical	Credits
IV	21CM A4A	Core paper – VI	Hrs/week	Hrs/Sem	Hrs/week	Hrs/Sem	0	4
			4	60	4	60		

COURSE OBJECTIVES:

The students will be able to

- Understand the theoretical concepts of algebra and to develop abstract thinking in algebra.
- Acquire knowledge on the basic theory of group, Cayley ‘s theorem, homomorphism, ring and ideal etc.,
- Learn the basic ideas and notions of abstract algebra which includes ring and field theory.

COURSE OUTCOMES:

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

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	Provide an insight on theoretical knowledge about Group, Sub-group and its examples and prove Lagrange’s theorem and its related concepts.	K3
CO2	Understand the notion of Counting Principle, Normal Subgroups, Homomorphism and theorems related to it.	K3
CO3	Acquire the knowledge about Automorphisms, Cayley’s theorem and permutation group	K3
CO4	Explore the concepts of theory of Rings, Integral domain and homomorphism.	K3
CO5	Gain knowledge about the Ideal, Prime ideal, Maximal ideal, Euclidean ring and related theorems.	K3

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

MAPPING WITH PROGRAM ME OUTCOMES:

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

S- Strong M – Medium L – Low

UNIT – I: GROUPS **12 Hours**

Definition of a Group – Examples – Subgroups, Lagrange's theorem- Corollary – Simple Theorems.

(Sections: 2.1 to 2.4)

UNIT – II: **GROUPS (Contd.)** **12 Hours**

Counting Principle – Normal Subgroups – Homomorphisms – Theorems – Simple Problems.

Section: 2.5 to 2.7 (Omit applications of 1 and 2 of 2)

UNIT – III: **GROUPS (Contd.)** **12 Hours**

Automorphisms – Cayley's Theorem – Permutation Groups.

(Sections: 2.8 to 2.10)

UNIT – IV: RINGS **12 Hours**

Definition and Examples – Integral Domain – Homomorphism of Rings

(Sections: 3.1 to 3.4)

UNIT – V: RINGS (Contd.) **12 Hour**

Idea: Prime Ideal and Maximal Ideal – Simple Theorems – Euclidean rings

(Sections: 3.5 to 3.7)

DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%

TEXT BOOK

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	I.N. Herstein	Topics in Algebra	Wiley Eastern Ltd, New Delhi(2nd Edition)	1989

REFERENCE BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	S. Arumugam	Modern Algebra.	Scitech Publications, Chennai	2004

2.	J.B.Fraleigh	A First Course in Algebra	Addison Wesley, Mass. (Indian Print) (3rd Edition)	1987
3.	Lloyd R. Jaisingh and Frank Ayres	Abstract Algebra	Tata McGraw Hill Edition, New Delhi (2nd Edition),	2005
4.	M.L. Santiago	Modern Algebra	Tata McGraw Hill, New Delhi.	2002

WEB RESOURCES

1. *http://www.math.clemson.edu/~macaule/math4120-online.html*
2. *http://archives.math.utk.edu/topics/abstractAlgebra*

TEACHING METHODOLOGY

1. Class room teaching
2. Giving Assignments for all units
3. Discussions
4. Home test
5. PPT presentation

SYLLABUS DESIGNER

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