## ALGEBRA

| Semester | Subject <br> Code | Category | Lecture |  | Theory |  | Practical | Credits |
| :---: | :---: | :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| I | 21 CMA1A | Core I | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0 | 4 |
|  |  |  |  | 75 | 5 | 75 |  |  |

## COURSE OBJECTIVES:

The students will be able to

- Develop their knowledge in Theory of Equations, Summation of Series, Matrices, Continued Fraction and Elementary Number Theory.
- Improve the problem-solving skills in Algebra.


## COURSE OUTCOMES:

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

| CO <br> Number | CO Statement | Knowledge <br> Level <br> (K1-K4) |
| :---: | :--- | :---: |
| $\mathbf{C O 1}$ | Perceive the concepts of Polynomial Equation and to solve it | K3 |
| $\mathbf{C O 2}$ | Solve the problems using Horner's method and Newton's <br> method | K3 |
| $\mathbf{C O 3}$ | Gain expertise in the concept of Summation of Series | K2 |
| $\mathbf{C O 4}$ | Study the types of matrices, Cayley Hamilton theorem and <br> Diagonalisation of a Matrix | K2 |
| $\mathbf{C O 5}$ | Acquire practical knowledge in the field of elementary <br> number theory | K4 |

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

## MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| C01 | S | M | S | M | S | M |
| C02 | S | S | M | M | S | M |
| C03 | S | S | M | S | M | S |
| C04 | M | M | S | S | M | S |
| C05 | M | S | S | M | S | S |

S- Strong; M-Medium; L-Low

Polynomial Equation - Imaginary and Irrational roots - Symmetric Function of roots in terms of Coefficient - Sum of $\mathrm{r}^{\text {th }}$ powers of roots - Reciprocal Equation - Transformation of Equation.

UNIT- II: THEORY OF EQUATIONS [Contd.]
15 Hours
Descartes Rule of Signs - Approximate Solutions of Polynomials by Horner's methodNewton's method.

UNIT- III: SUMMATION OF SERIES
15Hours
Binomial, Exponential and Logarithmic series (Theorems without proofs) - Simple Problems.

## UNIT- IV: MATRICES

15 Hours
Symmetric, Skew Symmetric, Hermitianand Skew Hermitian Matrices- Orthogonal and Unitary Matrices - Rank of Matrix- Consistency and Solutions of Linear Systems- Cayley Hamilton Theorem (without proof)- Eigen Values-Eigen Vectors-Similar MatricesDiagonalisation of a Matrix.

## UNIT - V: ELEMENTARY NUMBER THEORY

15 Hours
Prime Number-Composite Number-Decomposition of a Composite Number as a Product of Primes Uniquely (without proof)-Divisors of a positive integer-Congruence Modulo n-Euler Function(without proof)- Highest power of a Prime Number p contained in n!-Fermat's and Wilson's Theorems

DISTRIBUTION OF MARKS: THEORY10\% AND PROBLEMS: 90\%

TEXT BOOK

| S.NO | AUTHORS | TITLE | PUBLISHERS | YEAR OF |
| :--- | :--- | :---: | :--- | :---: |
| PUBLICATION |  |  |  |  |$|$|  |  |
| :--- | :--- |
| 1. | T.K.ManickavachagomPillay, <br> T.N.Natarajan and <br> K.S.Ganapathy Volume I \&II. |
| Algebra | S.Viswanathan <br>  <br> Publishes Pvt. Ltd. |

## REFERENCE BOOKS

| S.NO | AUTHORS | TITLE | PUBLISHERS | YEAR OF <br> PUBLICATION |
| :--- | :--- | :--- | :--- | :---: |
| 1. | S.Arumugam | Algebra | New Gamma <br> Publishing House | 2003 |
| 2. | A.Singaravelu | Algebra and <br> Trignometry | Meenakshi Agency | 2003 |

## WEB RESOURCES

1. http://lib1.org/_ads/390EDD85BC279835BA7847DA4724CB9C

## TEACHING METHODOLOGY

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions

5 .PPT Presentations

## SYLLABUS DESIGNER

1. Dr. Nithyapriya, Assistant Professor of Mathematics.
2. Mrs. C. Revathi, Assistant Professor of Mathematics.
