Semester	Course Code	Course Category	Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
III	24UMAVAC1	Value Added Course -I	30	-	-	100	100

Course Title	Vedic Mathematics

SYLLABUS

Unit	Contents	Hours
I	Addition– addition of algebraic expression. Subtraction – subtraction using "Ekadhikena Poorvena" – subtraction using "Ekanyunena Poorvena" – subtraction of polynomials. Multiplication – multiplication using "Nikhilum" sutra - multiplication using "Urdhva Triyagbhyam".	6
II	Division – division using "Nikhilum" sutra - division using "Paravartya Yojayet" – division of polynomials. Divisibility – Positive Osculators - Negative Osculators Square and Square root – square using Yavadunam Method – square using "Ekadhikena Poorvena" – square root.	6
III	Cube and Cube roots – cube using Yavadunam Method – cube using Anurupyena" method – cube root. Decimals – operation on decimals – conversion into decimals – addition of decimals – subtraction of decimals – multiplication of decimals. Factorization – simple quadratic equation – homogeneous quadratic equation – complex quadratic non homogenous polynomials – cubic polynomials.	6
IV	Highest common factor - Simple equation - Quadratic equation.	6
V	Cubic equation – solving cubic equation using "Purna and Paravartya" – special types of cubic equations. Biquadratic equation. Simultaneous Equation – Solving for X – Solving Y.	6

Text Books:

Pandit Ramnandan Shashtri, For Competitive Exams Vedic Mathematics Made Easy, Arihant Publication (I) Pvt. Ltd, Meerut,2011.

Unit I Chapter 1, 2, 3
Unit II Chapter 4, 5, 6
Unit III Chapter 7, 8 ,9
Unit IV Chapter 10, 11, 12
Unit V Chapter 13, 14, 15

Reference Book:

1. Rajesh Kumar Thakur, Speed Mathematics Do It Quick, Do It Right!, Rupa Publication Pvt,. Ltd, 2022
2. Vedic Mathematics The Problem Solver, Maple Press Private Limited, 2020.

Web Resource:

https://www.ms.uky.edu/~sohum/ma330/files/manuscripts/Tirthaji_S.B.K.,_Agarwala_V.S.Vedic_mathematics_or_sixteen_simple_mathematical_formulae_from_the_VedasOrient_Book_Distributors_1981.pdf

Course Outcomes

Upon successful completion of this course, the student will be able to:

CO No.	CO Statement	Cognitive Level (K-Level)
CO1	remember the basic concepts of addition, subtraction and multiplication through Vedic mathematics.	K1
CO2	understand the deep insight of solving problems using Vedic mathematics.	K2
CO3	apply the mathematical idea of Vedic mathematics concepts.	K3
CO4	analyse the difference between the normal calculation and Vedic mathematics calculation.	K4
CO5	solve the mathematical problems easily and quickly in the competitive examinations.	K5

Course Coordinator: Dr. A. Prasanna
Dr. M. Mohamed Althaf

Semester	Course Code	Course Category	Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
V	24UMAVAC2	Value Added Course -II	30	-	-	100	100
Course Title	Reasoning						

SYLLABUS		
Unit	**Contents**	**Hours**
I	Series Completion – Number Series – Alphabet Series – Coding and Decoding – Letter Coding – Number Coding.	**6**
II	Blood Relation – Puzzle Test.	**6**
III	Direction Sense Test – Logical Venn Diagrams.	**6**
IV	Number, Ranking and Time Sequences Test – Mathematical Operations.	**6**
V	Analytical Reasoning – Mirror Images.	**6**

Text Books:

Dr. R.S. Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning, Revised Edition, S. Chand and Company Ltd, 2019

UNIT I **Part-I** Chapters 1 and 4
UNIT II **Part-I** Chapters 5 and 6
UNIT III **Part-I** Chapters 8 and 9
UNIT IV **Part-I** Chapters 12 and 13
UNIT V **Part-II** Chapters 4 and 5

Reference Book:

Dr. R.V. Praveen, Quantitative Aptitude and Reasoning Published by Asoke K. Ghosh, PHI Learning Pvt, Ltd.

Web Resource:

https://www.indiabix.com/logical-reasoning/questions-and-answers/

Course Outcomes

Upon successful completion of this course, the student will be able to:-

CO No.	CO Statement	Cognitive Level (K-Level)
CO1	remember the number systems	**K1**
CO2	understand the set theory concepts using Logical Venn Diagrams	**K2**
CO3	apply the mathematical operations for solving puzzle	**K3**
CO4	analyse the pattern to solve the problems in the Mirror and Water Images	**K4**
CO5	solve the mathematical problems in competitive examination	**K5**

Course Coordinator:
Dr. M.A. Rifayathali

Semester	Course Code	Course Category	Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
III	24PMAVAC1	Value Added Course -I	30	-	-	100	100
Course Title	Octave - Practical						

SYLLABUS

List of Programmes

1. Solving simultaneous algebraic equations.
2. Solving system of equations by matrix method.
3. Finding the Eigen values and Eigen vectors of a matrix.
4. Solving system of non-linear equations.
5. Finding the second and third derivatives of functions.
6. Finding the integral of functions.
7. Evaluating double and triple integrals.
8. Solving ordinary differential equations with initial condition.
9. Solving system of ordinary differential equations.
10. Creating and plotting 2-D and 3-D graphs.

Text Book:

Svein Linge, Hans Petter Langtangen, Programming for Computations - MATLAB/Octave, Springer Heidelberg Dordrecht London, New York, 2015.

Reference Books:

1. Jason Lachniet, Introduction to GNU Octave - A brief tutorial for linear algebra and calculus students, Third Edition, 2020.
2. Jesper Schmidt Hansen, GNU Octave Beginner's Guide, Packt Publishing, Mumbai, 2011
3. Rudra Pratap, Getting Started with Matlab, Oxford University Press, United Kingdom, 2010.

Web Resources:

https://www.wcc.vccs.edu/sites/default/files/Introduction-to-GNU-Octave.pdf.
http://calliope.dem.uniud.it/CLASS/ING-AMB/2018/GNU-Octave-for-beginners.pdf
https://youtu.be/woiU5PRVm7M?si=P7jkXALcsYgHAR6n
https://docs.octave.org/octave.pdf
http://www.springer.com/series/5151

Course Outcomes

Upon successful completion of this course, the student will be able to:

CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Remember the basic concepts of addition, subtraction, multiplication and through Octave.	**K1**
CO2	Understand the deep insight of solving problems using Octave.	**K2**
CO3	Apply the mathematical ideas for solving differential equations using octave.	**K3**
CO4	Analyse the difference between the Trapezoidal and Midpoint method using Octave software.	**K4**
CO5	Solve the mathematical problems easily and quickly using Octave Software	**K5**

Course Coordinator: Dr. H. SHEIK MUJIBUR RAHMAN