



Faculty of: **Computer Science**

Course: **Bachelor of Science Information Technology**

Semester: **I**

Subject Code: **MDC201-1C**

Subject Name: **FOUNDATION IN COMPUTATIONAL MATHEMATICS**

Sr. No	Category	Subject Code	Subject Name	Teaching hours/ Week			Credits	Credit Points	Evaluation Scheme/ Semester								Total
				Th	Tu	Pr			Theory				Tutorial / Practical				
									Continuous and Comprehensive Evaluation		End Semester Exams		Internal Assessment		End Semester Exams		
									Marks	Activity	Marks	Duration	Marks	Duration	Marks	Duration	
4	MDC	MDC201-1C	FOUNDATION IN COMPUTATIONAL MATHEMATICS	4	-	--	4	4	20	Assignment	50	2	--	--	-	-	100

**AIM:**

This course is aimed at enabling the students to solve arithmetic and logical problems

### COURSE CONTENTS

**Unit I Set**

**(10 Lectures)**

- Definition
- Methods of representing sets, Different notations in sets, Standard sets of numbers
- Types of sets, Empty set, Singleton set, Finite set, Infinite set, Equivalent Sets
- Equal sets, Subset, Superset, Proper subset, Power set, Universal set, Venn diagrams
- Operations on sets, Union of sets, Cardinal number of sets, Cardinal properties of sets
- De Morgan's law for intersection, Cartesian product of two sets

**Unit II Relation**

**(06 Lectures)**

- Definition, Properties of relation, Domain and range
- Representation of relations using graph, Types of relation
- Reflexive Relation, Symmetric Relation, Anti-Symmetric Relation
- Transitive Relation, Equivalence Relation, Combining relations
- Composition of Relations

**Unit III Function**

**(06 Lectures)**

- Definition, Domain, Co-domain and range of a function
- Types of functions, Even Function, Odd Function
- Monotonic Function, Subjective Function, Bijective Function
- Injective Function, Equal functions, Real functions
- Different functions and their graphs

**Unit IV Determinant and Matrix****(08 Lectures)**

- Definition of determinant, properties of determinant, Definition of matrix
- Types of matrices, row matrix, column matrix, null matrix
- square matrix, diagonal matrix, scalar matrix, identity matrix,
- Symmetric matrix, Orthogonal matrix, Transpose of matrix
- Addition of matrix, Subtraction of matrix
- Scalar multiplication of matrix, Matrix multiplication
- Determinant of a square matrix, Adjoint of a matrix, Inverse of matrix

**Unit V Co-ordinate Geometry****(05 Lectures)**

- Introduction
- Distance between two points, Section formula, Area of triangle
- Collinearity of three points, Equation of straight lines, Slope of a straight line
- Intercepts of a line on the axes, Standard forms of equations of straight lines
- Angle between two points

**Unit VI Limit and continuity****(10 Lectures)**

- Introduction to limit
- Meaning of  $x \rightarrow a$
- Meaning of  $x \rightarrow 0$
- Meaning of  $x \rightarrow \infty$
- Limit of a function, Limit of a function by preparing tables, Rules of limit
- Some standard limits, Notations for finite series, Introduction to continuity
- Definition of continuity, Examples.

**Arrangement of lectures duration and practical session as per defined credit numbers:**

Units	Lecture Duration (In Hrs.)		Calculation of Credits (In Numbers)		Total Lecture Duration	Credit Calculation
	Theory	Practical	Theory	Practical	Theory+ Practical	Theory+ Practical
Unit – 1	10	00	4	0	10	4
Unit – 2	06	00			06	
Unit – 3	06	00			06	
Unit – 4	08	00			08	
Unit – 5	05	00			05	
Unit – 6	10	00			10	
<b>TOTAL</b>	<b>45</b>	<b>00</b>	<b>4</b>	<b>0</b>	<b>45</b>	<b>4</b>

**Evaluation:**

Theory Marks	Practical Marks	Total Marks
<b>100</b>	<b>00</b>	<b>100</b>

**REFERENCE BOOKS:**

1. "BCA Advanced Mathematics", H.R. Vyas, B.S. Shah Publication (3rd Edition-2007)
2. "Fundamental of Mathematical Analysis", G Das & S Pattanayak, Tata McGraw-Hill publishing company Ltd.
3. "Mathematical & statistical foundation of computer science", C Jamnadas & Co (New Edition-2013).
4. "Polytechnic Mathematics", S. P Deshpande, Pune VidyarthiGruhPrakashan, 1984
5. "Advanced Mathematics", RaviGor, Nirav Publication(4th Edition-2006)