

## The Course Structure for the MCA Programme

<b>SEMESTER - I</b>		
Course Code	Theory	Credit (L-T-P)
MCA 1001	Problem Solving and Program Design with C	3 (3-0-0)
MCA 1003	Numerical & Statistical Methods	4 (3-1-0)
MCA 1007	Discrete Mathematics	3 (3-0-0)
MCA 1009	Computer Organization & Architecture	3 (3-0-0)
	Breadth Paper-I	3 (3-0-0)
	<b>Sessional</b>	
MCA 1002	C Programming Laboratory	2 (0-0-3)
MCA 1004	Numerical & Statistical Methods Laboratory	2 (0-0-3)
	<b>Total</b>	<b>20</b>

<b>SEMESTER - II</b>		
Course Code	Theory	Credit (L-T-P)
MCA 2001	Data Structures	3 (3-0-0)
MCA 2003	Object Oriented Design & Programming	3 (3-0-0)
MCA 2005	Database Management Systems	3 (3-0-0)
MCA 2007	Operating Systems	3 (3-0-0)
	<b>Sessional</b>	
MCA 2002	Data Structure Laboratory	2 (0-0-3)
MCA 2004	C++ Programming Laboratory	2 (0-0-3)
MCA 2006	RDBMS Laboratory	2 (0-0-3)
MCA 2008	Operating System Laboratory	2 (0-0-3)
	<b>Total</b>	<b>20</b>

<b>SEMESTER - III</b>		
Course Code	Theory	Credit (L-T-P)
MCA 3001	Java Programming	3 (3-0-0)
MCA 3003	Software Engineering	3 (3-0-0)
MCA 3005	Fundamentals of Computer Algorithms	3 (3-0-0)
MCA 3007	Automata Theory	4 (3-1-0)
	Elective - I	3 (3-0-0)
	<b>Sessional</b>	
MCA 3002	Java Programming Laboratory	2 (0-0-3)
MCA 3004	Software Engineering Laboratory	2 (0-0-3)
	<b>Total</b>	<b>20</b>

<b>SEMESTER - IV</b>		
Course Code	Theory	Credit (L-T-P)
MCA 4001	Compiler Design	4 (3-1-0)
MCA 4103	Data Communications and Computer Networks	3 (3-0-0)
MCA 4007	Computerized Financial Accounting	3 (3-0-0)
	Breadth Paper -II	3 (3-0-0)
	Elective - II	3 (3-0-0)
	<b>Sessional</b>	
MCA 4002	Compiler Design Laboratory	2 (0-0-3)
MCA 4004	Computer Networks Laboratory	2 (0-0-3)
	<b>Total</b>	<b>20</b>

<b>SEMESTER - V</b>		
Course Code	Theory	Credit (L-T-P)
MCA 5001	Computer Graphics	3 (3-0-0)
MCA 5003	System Simulation & Modeling	4 (3-1-0)
MCA 5005	Optimization Theory	3 (3-0-0)
	Breadth Paper - III	3 (3-0-0)
	Elective - III	3 (3-0-0)
	<b>Sessional</b>	
MCA 5002	Computer Graphics Laboratory	2 (0-0-3)
MCA 5004	System Simulation & Modelling Laboratory	2 (0-0-3)
	<b>Total</b>	<b>20</b>

<b>SEMESTER - VI</b>		
Course Code	Theory	Credit (L-T-P)
MCA 6001	Project	<b>20</b>
	<b>Total</b>	<b>20</b>

<b>Total Credits</b>	<b>120</b>
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### List of Electives

<b>Group I: Database Technology</b>	
Course Code	Theory
MCA 7101	Distributed Databases
MCA 7103	Decision Support Systems
MCA 7105	Enterprise Resource Planning
MCA 7107	Data Mining & Ware Housing
MCA 7109	Multimedia Databases

<b>Group II: Software Technology</b>	
Course Code	Theory
MCA 7201	Advanced Java Programming
MCA 7203	Systems Programming
MCA 7205	Programming Language Design and Concepts
MCA 7207	Assembly Language Programming
MCA 7209	Web Programming
MCA 7211	Software Project Management

<b>Group III: Cognitive Sciences and Intelligent Systems</b>	
Course Code	Theory
MCA 7301	Natural Language Processing
MCA 7303	Genetic Algorithms & Swarm Intelligence
MCA 7305	Artificial Intelligence
MCA 7307	Image Processing
MCA 7309	Soft Computing

<b>Group IV: Networking and Distributed Systems</b>	
Course Code	Theory
MCA 7401	Network Security and Cryptography
MCA 7403	Grid Computing
MCA 7405	Wireless Technology
MCA 7407	Parallel & Distributed Computing
MCA 7409	Mobile Computing
MCA 7411	Cloud Computing

<b>Group V: Applications of Information Technology</b>	
Course Code	Theory
MCA 7501	Bioinformatics
MCA 7505	Multimedia and Animation
MCA 7507	Supply Chain Management

**Notes:**

- i. Students are required to choose at least two electives from the same group.
- ii. Students are advised to do their projects on the areas where major electives are chosen.

## Syllabus for the Online Entrance Test for MCA 2017

The MCA 2017 Online Entrance Test shall comprise of 120 questions to be answered in 2 hours. Questions will be of objective type with multiple choices out of which only one is correct. A candidate must select only the correct answer to score full marks. For each correct answer a candidate will earn 4 marks. For every incorrect answer one mark will be deducted. If a question has not been attempted no credit will be given. The questions will be distributed into various areas as follows and the detailed syllabus is given below:

Section	Subject	No of Questions
A	Mathematics	60
B	Analytical ability & Logical Reasoning	20
C	Computer Awareness	20
D	English	20
	Total	120

### Section A: Mathematics (60 questions – objective type)

- **Algebra:** Fundamental operations in Algebra, expansion, factorization, quadratic equations, indices, logarithms, arithmetic, geometric and harmonic progressions, binomial theorem, permutations and combinations, surds
- **Set Theory:** Sets and subsets, operations on sets, sequences, properties of integers, relations and functions
- **Matrix Algebra:** Elementary transformations, inverse of a matrix, rank, solution of simultaneous linear equations, eigenvalues and eigenvectors, quadratic forms
- **Co-ordinate Geometry:** Rectangular Cartesian co-ordinates, equations of a line, mid point, intersections etc., equations of a circle, distance formulae, pair of straight lines, parabola, ellipse and hyperbola, simple geometric transformations such as translation, rotation, scaling.
- **Calculus:** Limit of functions, continuous functions, differentiation of function(s), tangents and normals, simple examples of maxima and minima, integration of function by parts, by substitution and by partial fraction, definite integral application to volumes and surfaces of frustums of a sphere, cone, cylinder, Taylor Series.
- **Differential Equations:** Differential equations of first order and their solutions, linear differential equations with constant coefficients, homogenous linear differential equations.
- **Vectors:** Position vector, addition and subtraction of vectors, scalar and vector products and their applications to simple geometrical problems and mechanics.
- **Trigonometry:** Simple identities, trigonometric equations, properties of triangles, solution of triangles, height and distance, inverse function
- **Probability and Statistics:** Basic concepts of probability theory, averages, dependent and independent events, frequency distributions, and measures of dispersions, skewness and kurtosis, random variable and distribution functions, mathematical expectations, binomial, Poisson, normal distributions, curve fitting, and principle of least squares, correlation and regression
- **Linear Programming:** Formulation of simple linear programming problems, basic concepts of graphical and simplex methods, revised simplex method, transportation and assignment problems, duality and integer programming

**Section B: Analytical Ability and Logical Reasoning: (20 questions – objective type)**

Questions in this section will test logical reasoning, quantitative reasoning, and visio-spatial reasoning

**Section C: Computer Awareness: (20 questions – objective type)**

- **Computer Basics** :Organization of a computer, Central Processing Unit (CPU), Structure of instructions in CPU, input / output devices, computer memory, memory organization, back-up devices
- **Data Representation:** Representation of characters, integers, and fractions, binary and hexadecimal representations, Binary Arithmetic: Addition, subtraction, division, multiplication, 1's and 2's complement arithmetic, floating point representation of numbers, normalized floating point representation, Boolean algebra, truth tables, Venn diagrams
- **Computer Architecture:** Block structure of computers, communication between processor and I / O devices, interrupts
- **Computer Language:** Assembly language and high-level language, Multiprogramming and time-sharing operating systems, Computer Programming in C.
- **Flow chart and Algorithms**
- **Operating Systems:** Evolution of operating systems, types of operating systems, functions of an operating system, modern operating systems

**Section D: English: (20 questions – objective type)**

- **Use of articles and prepositions** (fill in the blanks or correct use)
- **Idioms and phrases**
- **Synonyms**
- **Reading comprehension**
- **Expansion of an idea**
- **Sentence sequence** (jumbled sentences)
- **Completion of a sentence** (with choices)
- **Choice of appropriate word to fill in the blanks** (with options)
- **Abridging sentences / paragraphs.**