An Autonomous Institute Approved by **AICTE** *and affiliated to* **MAKAUT,** *West Bengal*

CURRICULUM STRUCTURE AND SYLLABUS

MASTERS OF COMPUTER APPLICATIONS (2024-2025)

DEPARTMENT OF COMPUTER APPLICATIONS

Objective:

To conduct software industry, corporate sector, academia, research-oriented MCA programfollowing the AICTE model for MCA

Eligibility:

Candidates with the following eligibility can take admission in the 2-year MCA program approvedby AICTE:

A. Students who have passed Bachelor of Computer Application or Bachelor's degree in Computer Science Engineering or equivalent degree
B. Students who have passed Bachelor of Science, Bachelor of Commerce or Bachelor of Arts with mathematics at 10+2 or at the graduation level with additional bridge courses as per the norms of the concerned university
C. Candidates must have obtained at least 50 percent marks, or 45 percent marks in the case of candidates belonging to reserved categories, in the qualifying examination

Duration:

2 Years (4 Semesters)

Program Educational Objectives (PEOs)

PEO 01: Technical Expertise: Develop the ability to plan, analyze, design, code, implement, test and maintain the software product for real time systems that are technically sound, economically feasible and socially acceptable

PEO 02: Successful Career: Exhibit professionalism, ethical attitude with updated technologies in Computer Application based career and capability to set up their own enterprise in various sectors of Computer Applications

PEO 03: Soft Skills: Develop communication skills, team work and leadership quality in their professional multidisciplinary projects and adapt to current trends by engaging in lifelong learning

PEO 04: Life Long Learning: Prepare the students to pursue higher studies by acquiring knowledge in mathematical, computing and engineering principles in the field of computing and related fields and to work in the fields of teaching and research

Program Specific Outcomes (PSOs)

The post-graduates of Master of Computer Application Program will demonstrate:

PSO 01: Software System Design and Development: The ability to apply software development life cycle principles to design and develop the application software that meets the automation needs of society and industry.

PSO 02: Computing and Research ability: The ability to employ modern computer languages, environments and platforms in creating innovative career paths in SMAC (Social, Mobile, Analytics and Cloud) technologies.

PSO 03: Professionalism and Ethics: Efficient team leaders, effective communicators and capable of working in multi-disciplinary environment following ethical values.

Program Outcomes (POs)

On Completion of MCA program, the post-graduates are expected to

PO-01: Engineering Knowledge: Ability to apply knowledge of computing, science, mathematics and engineering fundamentals appropriate to the discipline

PO-02: Problem Analysis: Ability to identify, critically analyze, formulate the computing requirements appropriate to its solution and develop computer applications

PO-03: Design/Development of Solutions: Ability to design, implement and evaluate a computer-based complex system, process, component, or program to meet desired needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations

PO-04: Conduct Investigations of Complex Problems: Use of research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions and develop Software with complete satisfaction to the Customer.

PO-05: Modern Tool Usage: Ability to apply current technologies, skills, and modern IT tools necessary for computing practice with an understanding of the limitations.

PO-06: The Engineer and Society: Ability to understand the impact of system solutions in a contemporary, global, economical, environmental and societal context for sustainable development.

PO-07: Environment and Sustainability: Ability to understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO-08: Ethics: Ability to discharge their duties with professional and ethical responsibilities as an individual as well as in multidisciplinary teams with positive attitude.

PO-09: Individual and Team Work: Ability to function individually in effective manner and on teams, including diverse and multidisciplinary, to accomplish a common goal.

PO-10: Communication: Ability to communicate effectively with a range of audiences and be customer friendly.

PO-11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team to manage projects and in multidisciplinary environments and should be economically feasible.

PO-12: Life-Long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological changes.

CURRICULUM FRAMEWORK

The MCA Program is the based on the following type of course:

SL. No.	Type of Course	Abbreviation
1	Professional Core Course	PCC
2	Professional Elective Course	PEC
3	Basic Science Mathematics	BSM
4	Professional Core Course Lab	PCL
5	Professional Elective Course Lab	PEL
6	Skill Development Course	SDC
7	Audit Elective Course	AEC
8	Project	PRJ
9	Seminar	SEM
10	Value Added Course	VAC

The Course and Credit Distribution is as under:

SL. No.	Type of Course	No. of Courses	Total Credit	Credit Percentage
1	Professional Core Course	10	40	40
2	Professional Elective Course	3	9	9
3	Basic Science Mathematics	2	8	8
4	Professional Core Course Lab	5	10	10
5	Professional Elective Course Lab	1	2	2
6	Skill Development Course	1	2	2
7	Audit Elective Course	1	3	3
8	Project	2	23	23
9	Seminar	1	1	1
10	Value Added Course	1	2	2
	TOTAL	**27**	**100**	**100**

Course Distribution: Semester wise

SL. No.	Type of Course	No. of Courses per Semester				Total
		I	II	III	IV	
1	Professional Core Course	3	3	4	0	10
2	Professional Elective Course	0	1	1	1	3
3	Basic Science Mathematics	1	1	0	0	2
4	Professional Core Course Lab	2	2	1	0	5
5	Professional Elective Course Lab	0	1	0	0	1
6	Skill Development Course	1	0	0	0	1
7	Audit Elective Course	1	0	0	0	1
8	Project	0	0	1	1	2
9	Seminar	0	0	1	0	1
10	Value Added Course	0	0	0	1	1
	TOTAL	**8**	**8**	**8**	**3**	**27**

Credit Distribution: Semester wise

SL. No.	Type of Course	No. of Credits per Semester				Total
		I	II	III	IV	
1	Professional Core Course	12	12	16	0	40
2	Professional Elective Course	0	3	3	3	9
3	Basic Science Mathematics	4	4	0	0	8
4	Professional Core Course Lab	4	4	2	0	10
5	Professional Elective Course Lab	0	2	0	0	2
6	Skill Development Course	2	0	0	0	2
7	Audit Elective Course	3	0	0	0	3
8	Project	0	0	3	20	23
9	Seminar	0	0	1	0	1
10	Value Added Course	0	0	0	2	2
	TOTAL	**25**	**25**	**25**	**25**	**100**

Semester-wise Credit, Hours/Week and Marks:

Semester	Credits	Hours/Week	Marks
I	25	31	800
II	25	32	800
III	25	32	800
IV	25	23	300
Total	**100**	**118**	**2700**

SEMESTER–I

THEORY

Sl. No	Category	Paper Code	Paper Name	L	T	P	Total	Credit
1	PCC	CA-101	Data Structure	4	-	-	4	4
2	PCC	CA-102	Object Oriented Programming with JAVA	4	-	-	4	4
3	PCC	CA-103	Computer Organization and Architecture	4	-	-	4	4
4	BSM	CA-104	Discrete Mathematics	4	-	-	4	4
5	**Audit Elective**			3	-	-	3	3
	AEC	CA-E105A	Constitution of India					
		CA-E105B	Stress Management through Yoga					
		CA-E105C	Ethics in Business Profession					
		CA-E105D	Environment & Ecology					

PRACTICAL / SESSIONAL

Sl. No	Category	Paper Code	Paper Name	L	T	P	Total	Credit
1	SDC	CA-181	Soft Skill and Interpersonal Communication	-	-	4	4	2
2	PCL	CA-191	Data Structure Lab	-	-	4	4	2
3	PCL	CA-192	Object Oriented Programming with JAVA Lab	-	-	4	4	2
			Total Weekly Contact Hours and Credit				**31**	**25**

BRIDGE COURSE
[Only for Students under Category "B" stated in the "Eligibility" Section]

Fundamentals of Computer Applications

SEMESTER–II

THEORY

Sl. No	Category	Paper Code	Paper Name	L	T	P	Total	Credit
1	PCC	CA-201	Principles of Operating System	4	-	-	4	4
2	PCC	CA-202	Relational Database Management System	4	-	-	4	4
3	PCC	CA-203	Artificial Intelligence & Machine Learning	4	-	-	4	4
4	BSM	CA-204	Probability & Statistics	4	-	-	4	4
5	**Professional Elective-I**			4	-	-	4	3
	PEC	CA-E205A	Web Enabled JAVA Programming					
		CA-E205B	Web Technology using PHP					
		CA-E205C	Android Application Development					
		CA-E205D	Web Technology using ReactJS					

PRACTICAL / SESSIONAL

Sl. No	Category	Paper Code	Paper Name	L	T	P	Total	Credit
1	PCL	CA-292	Relational Database Management System Lab	-	-	4	4	2
2	PCL	CA-293	Artificial Intelligence & Machine Learning Lab	-	-	4	4	2
3	PEL	CA-E295 (A/B/C/D)	Professional Elective-1 Lab	-	-	4	4	2
	Total Weekly Contact Hours and Credit						**32**	**25**
	BRIDGE COURSE **[Only for Students under Category "B" stated in the "Eligibility" Section]**							
	Fundamental Mathematics							

SEMESTER–III

THEORY

Sl. No	Category	PaperCode	PaperName	L	T	P	Total	Credit
				ContactHours /Week				
1	PCC	CA-301	Object Oriented Software Engineering	4	-	-	4	4
2	PCC	CA-302	Networking	4	-	-	4	4
3	PCC	CA-303	Design and Analysis of Algorithm	4	-	-	4	4
4	PCC	CA-304	Data Science	4	-	-	4	4
5	**Professional Elective-II**			4	-	-	4	3
	PEC	CA-E305A	Introduction to Cyber Security					
		CA-E305B	Introduction to IoT					
		CA-E305C	Automata Theory & Formal Languages					
		CA-E305D	Fundamentals of Cryptography					

PRACTICAL / SESSIONAL

Sl. No	Category	PaperCode	PaperName	L	T	P	Total	Credit
1	PCL	CA-394	Data Science with Python Lab	-	-	4	4	2
2	PRJ	CA-381	Mini Project	-	-	4	4	3
3	SEM	CA-382	Seminar on Internship/ Summer Training	-	-	-	-	1
			Total Weekly Contact Hours and Credit				**32**	**25**

			SEMESTER–IV					

THEORY

Sl. No	Category	PaperCode	PaperName	ContactHours /Week				Credit
				L	T	P	Total	
1	VAC	CA-401	Research Methodology & IPR	3	-	-	3	2
2	**Professional Elective-III**			4	-	-	4	3
	PEC	CA-E402A	Neural Network & Deep Learning					
		CA-E402B	Compiler Design					
		CA-E402C	Cloud Computing					
		CA-E402D	Data Mining & Data Warehousing					
		CA-E402E	Advanced DBMS					
		CA-E402F	Image Processing					
		CA-E402G	Block Chain					

SESSIONAL

1	PRJ	CA-482	Major Project and Viva-voce	-	-	16	16	20
			Total Weekly Contact Hours and Credit				**23**	**25**