MANGALORE UNIVERSITY

Credits Pattern, Scheme of Examination and Syllabus for Two Years Master of Computer Applications (MCA) Degree Programme.

Choice Based Credit System (CBCS) (2022-23)

POST-GRADUATE DEPARTMENT OF STUDIES AND RESEARCH IN COMPUTER SCIENCE
MANGALORE UNIVERSITY, MANGALAGANGOTHRI, KONAJE – 574 199
SEPTEMBER - 2022

Credits Pattern, Scheme of Examination and Syllabus for Two Years Master of Computer Applications (MCA) Degree Programme (CBCS Semester Scheme).

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1: To provide core theoretical and practical knowledge in the domain of Computer Applications for leading successful career in academia, industries, pursuing higher studies or entrepreneurial endeavors.

PEO2: To develop the ability to critically think, analyze and make decisions for offering techno-commercially feasible and socially acceptable solutions to real life problems in the areas of computing.

PEO3: To imbibe life-long learning, professional and ethical attitude for embracing global challenges and make positive impact on environment and society.

The Programme Learning Objectives are:

PLO1: Scientific knowledge: Apply the knowledge of mathematics, science, and engineering fundamentals to the solution of complex scientific/societal/engineering problems.

PLO2: Problem analysis and Solutions: Identify, formulate, research literature, and analyze complex scientific/societal/engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. Design solutions for complex scientific/societal/engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PLO3: Conduct investigations of complex problems and communication: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. Communicate effectively on complex scientific/societal/engineering activities with the scientific community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PLO4: Modern tools usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex scientific/engineering activities with an understanding of the limitations.

PLO5: Environment and sustainability: Understand the impact of the professional scientific solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PLO6: Ethics and Team Work: Apply ethical principles and commit to professional ethics and responsibilities and norms of the social/scientific practice. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PLO7: 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.

PLO8: 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 change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1: To identify, critically analyze, formulate and develop computer applications by applying knowledge of mathematics, computer science and management in practice.

PSO2: An ability to select modern computing tools and techniques and use them with dexterity and hence to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability.

PSO3: An ability to devise and conduct experiments, interpret data and provide well informed conclusions and hence to understand the impact of system solutions in a contemporary, global, economic, environmental, and societal context for sustainable development.

PSO4: An ability to function professionally with ethical responsibility as an individual as well as in multidisciplinary teams with a positive attitude.

PSO5: An ability to communicate effectively and an ability to appreciate the importance of goal setting and to recognize the need for life-long learning.

Credits Pattern and Scheme of Examination

I SEMESTER M.C.A.								
Course Code	Courses	Theory Hours/ Week	Practical Hrs./ Week	Duration of exams (Hours)	Marks & Credits			
					IA	Exam	Total	Credits
HARD CORE								
22MCAH101	Mathematical Foundations of Computer Science	4L	-	3	30	70	100	4
22MCAH102	Operating Systems	4L	-	3	30	70	100	4
22MCAH103	Object Oriented Programming	4L	-	3	30	70	100	4
22MCAH104	Advanced Data Structure and Algorithms	4L	-	3	30	70	100	4
SOFT CORE								
22MCAS105	. NET Technology	4L	-	3	30	70	100	4
22MCAS106	Python Programming	4L	-	3	30	70	100	4
BRIDGE COURSE*								
22MCAS107	Foundations of Information Technology	4L	-	3	30	70	100	-
PRACTICALS [Any two labs shall be selected]								
22MCAP108	Advanced Data Structure and Algorithms Lab	-	6	3	30	70	100	3
22MCAP109	.NET Technology Lab	-	6	3	30	70	100	3
22MCAP110	Python Programming Lab	-	6	3	30	70	100	3
	TOTAL	20+4*	12	21+3*	210	490	700	26

*Bridge Course: 22MCAS107: Foundation of Information Technology is a non-credit Course to be offered only for non-computer science background students. However such students have to obtain eligibility both in IA and Final Examination.

II SEMESTER M.C.A.								
Course Code	Courses	Theory Hours/ Week	Practical Hours/ Week	Duration of exams (Hours)	Marks & Credits			
					IA	Exam	Total	Credits
HARD CORE								
22MCAH201	Principles of Data Science	4L	-	3	30	70	100	4
22MCAH202	Software Engineering	4L	-	3	30	70	100	4
22MCAH203	Data Communications and Computer Networks	4L	-	3	30	70	100	4
SOFTCORE [Any One course shall be selected from the list of courses]								
22MCAS204	Android Programming	4L	-	3	30	70	100	4
22MCAS205	Wireless Sensor Networks	4L	-	3	30	70	100	4
PRACTICALS [Two practical shall be selected from the list]								
22MCAP206	Principles of Data Science Lab	-	6	3	30	70	100	3
22MCAP207	Android Programming Lab	-	6	3	30	70	100	3
22MCAP208	Data Communications and Computer Networks Lab	-	6	3	30	70	100	3
22MCAP209	Object Oriented Data Modeling Lab	-	6	3	30	70	100	3
22MCAP210	Advanced Java Programming Lab	-	6	3	30	70	100	3
22MCAP211	Distributed Computing Lab	-	6	3	30	70	100	3
ELECTIVE - I [Within the Department]								
22MCAE21#	Elective - I	3L	-	3	30	70	100	3
	TOTAL	**19**	**12**	**21**	**210**	**490**	**700**	**25**

BASED ON THE SELECTED ELECTIVE COURSE

SECOND SEMESTER ELECTIVE COURSES: ELECTIVE - I

Subject Code	Name of the Elective Course
22MCAE212	DISTRIBUTED COMPUTING
22MCAE213	ADVANCED JAVA PROGRAMMING
22MCAE214	OBJECT ORIENTED DATA MODELING
22MCAE215	PATTERN RECOGNITION
22MCAE216	CLOUD COMPUTING

III SEMESTER M.C.A.								
Course Code	Courses	Theory Hours/ Week	Practical Hours/ Week	Duration of exams (Hours)	Marks & Credits			
					IA	Exam	Total	Credits
HARD CORE								
22MCAH301	Artificial Intelligence and Machine Learning	4L	-	3	30	70	100	4
22MCAH302	Internet of Things	4L	-	3	30	70	100	4
22MCAH303	Advanced Database Management Systems	4L	-	3	30	70	100	4
SOFT CORE [Only ONE course shall be selected from the list of courses]								
22MCAS304	Computer Graphics and Multimedia	4L	-	3	30	70	100	4
22MCAS305	Image Processing	4L	-	3	30	70	100	4
22MCAS306	Cryptography And Network Security	4L	-	3	30	70	100	4
PRACTICALS [One practical shall be selected from the list]								
22MCAP307	Artificial Intelligence and Machine Learning Lab	-	6	3	30	70	100	3
22MCAP308	Internet of Things Lab	-	6	3	30	70	100	3
22MCAP309	Computer Graphics and Multimedia Lab	-	6	3	30	70	100	3
22MCAP310	Image Processing Lab	-	6	3	30	70	100	3
22MCAP311	Advanced Database Management Systems Lab	-	6	3	30	70	100	3
22MCAM312	Mini Project and Domain Knowledge Seminar	-	6	3	30	70*	100	3
ELECTIVE - II [Within the Department]								
22MCAE31#	Elective - II	3L	-	3	30	70	100	3
Total		**19**	**12**	**21**	**210**	**490**	**700**	**25**

* The conduction of examination is similar to the practical examination which is evaluated based on the Mini Project Work.

Based on the Selected Elective Course

THIRD SEMESTER ELECTIVE COURSES: ELECTIVE - II

Course Code	Name of the Elective Course
22MCAE313	CYBER SECURITY
22MCAE314	MOBILE COMPUTING
22MCAE315	SOFTWARE QUALITY ASSURANCE
22MCAE316	BLOCK CHAIN MANAGEMENT
MCAE317	NATURAL LANGUAGE PROCESSING

IV SEMESTER MCA							
Course Code	Course	Practical Hours/ Week	Duration of Exam (Hrs)	Marks & Credits			
				IA	Dissertation + Viva Exam	Total	Credits
22MCAP401	Dissertation and Viva-Voce	32	—	100	300 (Report : 200 Viva-Voce: 100)	400	16
TOTAL MARKS OF FIRST SEMESTER						700	26
TOTAL MARKS OF SECOND SEMESTER						700	25
TOTAL MARKS OF THIRD SEMESTER						700	25
TOTAL MARKS OF FOURTH SEMESTER						400	16
GRAND TOTAL CREDITS OF ALL THE FOUR SEMESTERS						**2500**	**92**

Note: The dissertation work shall be carried out either in the University, Software Company, R&D Organization or any Institutes of National Importance.

List of Hard Core, Soft Core and Elective Courses

Hard Core Courses			
Sl. No.	Course Code	Course Title	Total Credits
1.	22MCAH101	Mathematical Foundation of Computer Science	4
2.	22MCAH102	Operating Systems	4
3.	22MCAH103	Object Oriented Programming	4
4.	22MCAH104	Advanced Data Structure and Algorithms	4
5.	22MCAH201	Principles of Data Science	4
6.	22MCAH202	Software Engineering	4
7.	22MCAH203	Data Communications and Computer Networks	4
8.	22MCAH301	Artificial Intelligence & Machine learning	4
9.	22MCAH302	Internet of Things	4
10	22MCAH303	Advanced Database Management Systems	4
11	22MCAP401	Dissertation with viva voce examination	16
TOTAL			56

Soft Core Courses			
Sl. No.	Course Code	Course Title	Total Credits
1	22MCAS105	. NET Technology	4
2	22MCAS106	Python Programming	
3	22MCAS107	Foundations of Information Technology	0
4	22MCAP108	Advanced Data Structure and Algorithms Lab	3+ 3
5	22MCAP109	. Net Technology Lab	
6	22MCAP110	Python Programming Lab	

7	22MCAS204	Android Programming	4
8	22MCAS205	Wireless Sensor Networks	
9	22MCAP206	Principles of Data Science Lab	3 + 3
10	22MCAP207	Android Programming Lab	
11	22MCAP208	Data Communications and Computer Networks Lab	
12	22MCAP209	Object Oriented Data Modeling Lab	
13	22MCAP210	Advanced Java Programming Lab	
14	22MCAP211	Distributed Computing Lab	
15	22MCAS304	Computer Graphics and Multimedia	4
16	22MCAS305	Image Processing	
17	22MCAP306	Cryptography and Network Security	
18	22MCAP307	AI & ML Lab	3
19	22MCAP308	Internet of Things Lab	
20	22MCAP309	Computer Graphics and Multimedia lab	
21	22MCAP310	Image Processing Lab	
22	22MCAP311	Advanced Database Management Systems Lab	
23	22MCAM312	Mini Project and Domain Knowledge Seminar	3
Total			30

Elective Courses			
Sl. No.	Course Code	Course Title	Total Credits
1	22MCAE212	Distributed Computing	3
2	22MCAE213	Advanced Java Programming	
3	22MCAE214	Object Oriented Data Modeling	
4	22MCAE215	Pattern Recognition	
5	22MCAE216	Cloud Computing	
6	22MCAE313	Cyber Security	3
7	22MCAE314	Mobile Computing	
8	22MCAE315	Software Quality Assurance	
9	22MCAE316	Block Chain Management	
10	22MCAE317	Natural Language Processing	
Total			6

Percentage coverage of Hard core/Soft core/Elective Courses:

Hard Core Credits:	16 + 12+12+16	= 56	(60.87%)
Soft Core Credits:	10 +10+10	= 30	(32.60%)
Elective Credits:	03 +03	= 06	(6.52%)