MANGALORE UNIVERSITY

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

Choice Based Credit System (CBCS) (2020-21)

POST-GRADUATE DEPARTMENT OF STUDIES AND RESEARCH IN COMPUTER SCIENCE
MANGALORE UNIVERSITY, MANGALAGANGOTHRI, KONAJE – 574 199
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Credits Pattern, Scheme of Examination and Syllabus for Two Years Master of Computer Applications (MCA) Degree Programme (CBCS Semester Scheme).

PREAMBLE:

The University Grants Commission, New Delhi has directed all the Universities in the Country to implement the Choice Based Credit System (CBCS Semester Scheme) at the level of Undergraduate and Post-Graduate Programmes. Further, the All India Council for Technical Education (AICTE) in its approval process hand book 2020-2021 has issued a circular to change the duration of the existing Master of Computer Applications programme from three years to two years. In this regard, University Grants Commission has given an approval in its 545th Meeting held on 19.12.2019 and the same has been communicated to all the universities by AICTE vide its letter No. AICTE/AB/MCA/2020-21 dated 03.07.2020. Hence, the University considered the change in the duration of the MCA programme from the existing three years to two years. In addition, Mangalore University administration has directed the P.G. Board of Studies in Computer Science to frame the revised course pattern, scheme of examination and syllabus for the two years Master of Computer Applications programme within the framework of the '*Regulations governing the Choice Based Credit System for the two years Post Graduate Degree programmes under Arts, Science, Commerce and Education Discipline'* which is being implemented for all the other PG programme of the University. Accordingly, the internal members of P.G. Board of Studies in Computer Science prepared a draft syllabus in the first instance. Subsequently, the regulations, scheme of examination and syllabus are placed before the P.G. Board of Studies in Computer Science. The P.G. Board of Studies in Computer Science thoroughly discussed, modified and finalized the regulations, credit pattern, scheme of examination and syllabus for two years Master of Computer Applications programme keeping the current IT developments as a basis. The proposed two years Master of Computer Applications programme scheme has total credits of 92 [Hard Core credits: 56 (60.87%), Soft Core credits: 30 (32.60%) and Elective credits: 06 (6.52%)] and each semester comprises of subjects of recent developments. The syllabi of each subject comprises of four units of either 48 hours or 36 hours of teaching, which is on par with existing two years M.Sc. (Computer Science) programme.

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 Hours/ Week	Duration of exams (Hours)	Marks & Credits			
					IA	Exam	Total	Credits
HARD CORE								
MCAH101	Mathematical Foundations of Computer Science	4L	-	3	30	70	100	4
MCAH102	Operating Systems	4L	-	3	30	70	100	4
MCAH103	Object Oriented Programming	4L	-	3	30	70	100	4
MCAH104	Advanced Data Structure and Algorithms	4L	-	3	30	70	100	4
SOFT CORE								
MCAS105	. NET Technology	4L	-	3	30	70	100	4
BRIDGE COURSE*								

MCAS106	Foundation of Information Technology	4L	-	3	30	70	100	-
PRACTICALS								
MCAP107	Data Structure and Algorithms Lab	-	6	3	30	70	100	3
MCAP108	.Net Technology Lab	-	6	3	30	70	100	3
	TOTAL	20+4*	12	21+3*	210	490	700	26

*Bridge Course: MCAS106: 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								
MCAH201	Data Analytics with R/Python	4L	-	3	30	70	100	4
MCAH202	Advanced Database Management Systems	4L	-	3	30	70	100	4
MCAH203	Data Communications and Computer Networks	4L	-	3	30	70	100	4
SOFTCORE [Any ONE course shall be selected from the list of courses]								
MCAS204	Android Programming	4L	-	3	30	70	100	4
MCAS205	Wireless Sensor Networks							
PRACTICALS [Two practical courses shall be selected from the list]								
MCAP206	Data Analytics with Python Lab	-	6	3	30	70	100	3
MCAP207	Android Programming Lab	-	6	3	30	70	100	3
MCAP208	ADBMS Lab	-	6	3	30	70	100	3
MCAP209	Object Oriented Data Modeling Lab	-	6	3	30	70	100	3
MCAP210	Advanced Java Programming Lab	-	6	3	30	70	100	3
ELECTIVE - I [Within the Department]								
MCAE21#	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
MCAE211	DISTRIBUTED COMPUTING
MCAE212	ADVANCED JAVA PROGRAMMING
MCAE213	OBJECT ORIENTED DATA MODELING
MCAE214	PATTERN RECOGNITION
MCAE215	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								
MCAH301	Artificial Intelligence & Machine Learning	4L	-	3	30	70	100	4
MCAH302	Internet of Things	4L	-	3	30	70	100	4
MCAH303	Software Engineering	4L	-	3	30	70	100	4
SOFT CORE [Only ONE course shall be selected from the list of courses]								
MCAS304	Computer Graphics and Multimedia	4L	-	3	30	70	100	4
MCAS305	Image Processing							
PRACTICALS [One practical course shall be selected from the list]								
MCAP306	Artificial Intelligence & Machine Learning Lab	-	6	3	30	70	100	3
MCAP307	Internet of Things Lab	-	6	3	30	70	100	3
MCAP308	Computer Graphics and Multimedia Lab	-	6	3	30	70	100	3
MCAP309	Image Processing Lab	-	6	3	30	70	100	3
MCAM310	Mini Project and Domain Knowledge Seminar	-	6	3	30	70*	100	3
ELECTIVE - II [Within the Department]								
MCAE31#	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
MCAE311	CYBER SECURITY
MCAE312	MOBILE COMPUTING
MCAE313	SOFT COMPUTING PARADIGM
MCAE314	SOFTWARE QUALITY ASSURANCE
MCAE315	BLOCK CHAIN MANAGEMENT
MCAE316	NATURAL LANGUAGE PROCESSING

IV SEMESTER MCA							
Course Code	Course	Practical Hours/ Week	Duration of Exam (Hrs)	Marks & Credits			
				IA	Dissertation + Viva Exam	Total	Credits
MCAP401	Project Work Report 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 Project 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.	MCAH101	Mathematical Foundation of Computer Science	4
2.	MCAH102	Operating Systems	4
3.	MCAH103	Object Oriented Programming with Java	4
4.	MCAH104	Advanced Data Structure and Algorithms	4
5.	MCAH201	Data Analytics with R/Python	4
6.	MCAH202	Advanced Database Management Systems	4
7.	MCAH203	Data Communications and Computer Networks	4
8.	MCAH301	Artificial Intelligence & Machine learning	4
9.	MCAH302	Internet of Things	4
10	MCAH303	Software Engineering	4
11	MCAP401	Project Work [Dissertation with Project viva voce examination]	16
TOTAL			56

Soft Core Courses			
Sl. No.	Course Code	Course Title	Total Credits
1	MCAS105	. Net Technology	4
2	MCAS106	Foundation of Information Technology	0
3	MCAP107	Data Structure and Algorithms Lab	3
4	MCAP108	. Net Technology Lab	3
5	MCAS204	Android Programming	4
6	MCAS205	Wireless Sensor Networks	
7	MCAP206	Data Analytics With Python Programming Lab	3 + 3
8	MCAP207	Android Programming Lab	
8	MCAP208	ADBMS Lab	
9	MCAP209	Object Oriented Data Modeling Lab	
10	MCAP210	Advanced Java Programming Lab	
11	MCAS304	Computer Graphics and Multimedia	4
12	MCAS305	Image Processing	
13	MCAP306	AI & ML Lab	3
14	MCAP307	Internet of Things Lab	
15	MCAP308	Computer Graphics and Multimedia lab	
16	MCAP309	Image Processing Lab	
11	MCAM310	Mini Project and Domain Knowledge Seminar	3
Total			30

Elective Courses			
Sl. No.	Course Code	Course Title	Total Credits
1	MCAE211	Distributed Computing	3
2	MCAE212	Advanced Java Programming	
3	MCAE213	Object Oriented Data Modeling	
4	MCAE214	Pattern Recognition	
5	MCAE215	Cloud Computing	
6	MCAE311	Cyber Security	3
7	MCAE312	Mobile Computing	
8	MCAE313	Soft Computing Paradigm	
9	MCAE314	Software Quality Assurance	
10	MCAE315	Block Chain Management	
11	MCAE316	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%)