MANGALORE  **UNIVERSITY**

Credits Pattern, Scheme of Examination and Syllabus for Master of Science in Computer Science 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 Master of Science in Computer Science Degree Programme (CBCS Semester Scheme).

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

M.Sc. in Computer Science Degree programme provides a demanding education that combines central topics in computing and specialization in a more focused area with added prominence on the physical and architectural substructures of modern computer system design. Our graduates have the extensiveness of understanding a practice both in traditional areas of computing and in applications to other disciplines. The Learning objectives of this programme are:

PEO1: Practice and grow as computing professionals, conducting research and/or leading, designing, developing or maintaining projects in various technical areas of computer science.

PEO2: Utilize knowledge and skills in Computer Science effectively for improving the society.

PEO3: Use new technical advancements of Computer Science to produce tangible contributions in the profession.

The Programme Learning Objectives:

The curriculum leading to M.Sc in Computer Science degree prepares the students for the positions as computer scientists, Data scientists, and software engineers and Academicians in Business Intelligence, Information Technology, Software Industry and Government segments. The curriculum's main objectives are to convey students with an understanding of the Hardware, Software and problem solving skills through Algorithmic approaches and to develop proficiency in the practice of computing, and to prepare them for continued professional development. After completion of M.Sc. in Computer Science, students will be able to:

PLO1: Apply algorithmic, mathematical and scientific reasoning to a variety of computational problems.

PLO2: Design, Evaluate, implement and document solutions to significant computational problems.

PLO3: Analyze and compare alternative solutions to computing problems.

PLO4: Implement software systems that meet specified design and performance requirements.

PLO5: Work effectively in teams to design and implement solutions to computational problems.

PLO6: Communicate effectively, both orally and in writing.

PLO7: Recognize the social and ethical responsibilities of a professional working in the discipline.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

On completion of the M.Sc.-Computer Science Degree programme the graduates will be able to:

PSO1: Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity.

PSO2: Apply standard Software Engineering practices and strategies in real-time software project development using open-source programming environment or commercial environment to deliver quality product for the organization success.

PSO3: Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems.

Credits Patten and Scheme of Examination:

I Semester M.Sc. Computer Science								
Course Code	Courses	Theory Hours/ Week	Practical Hours/ Week	Duration of exams (Hours)	Marks & Credits			
					IA	Exam	Total	Credits
HARD CORE								
22CSH101	Mathematical Foundations of Computer Science	4L	-	3	30	70	100	4
22CSH102	Advanced Data Structures and Algorithms	4L	-	3	30	70	100	4
22CSH103	Data Communications and Computer Networks	4L	-	3	30	70	100	4
22CSH104	Advanced Operating System	4L	-	3	30	70	100	4
SOFT CORE [Any ONE course shall be selected from the list of courses]								
22CSS105	.NET Technology	4L	-	3	30	70	100	4
22CSS106	Android Programming	4L	-	3	30	70	100	4
22CSS107	Computer Graphics and Multimedia	4L	-	3	30	70	100	4
PRACTICALS [Two practical courses shall be selected from the list]								
22CSP108	Advanced Data Structures and Algorithms Lab	-	6	3	30	70	100	3
22CSP109	.NET Technology Lab	-	6	3	30	70	100	3
22CSP110	Android Programming Lab	-	6	3	30	70	100	3
22CSP111	Computer Graphics and Multimedia Lab	-	6	3	30	70	100	3
	TOTAL	20	12	21	210	490	700	26

II Semester M.Sc. Computer Science								
Course Code	Courses	Theory Hours/ Week	Practical Hours/ Week	Duration of exams (Hours)	Marks & Credits			
					IA	Exam	Total	Credits
HARD CORE								
22CSH201	Internet of Things	4L	-	3	30	70	100	4
22CSH202	Principles of Data Science	4L	-	3	30	70	100	4
22CSH203	Advanced Database Management Systems	4L	-	3	30	70	100	4
SOFTCORE [Any ONE course shall be selected from the list of courses]								
22CSS204	Image Processing	4L	-	3	30	70	100	4
22CSS205	Big Data Analytics	4L	-	3	30	70	100	4
22CSS206	Wireless Sensor Networks	4L	-	3	30	70	100	4
22CSS207	Mobile Computing	4L	-	3	30	70	100	4
22CSS208	Embedded Systems	4L	-	3	30	70	100	4
PRACTICAL [Two practical courses shall be selected from the list]								
22CSP209	Principles of Data Science Lab	-	6	3	30	70	100	3
22CSP210	Internet of Things Lab	-	6	3	30	70	100	3
22CSP211	Image Processing Lab	-	6	3	30	70	100	3
22CSP212	Big Data Analytics Lab	-	6	3	30	70	100	3
OPEN ELECTIVE								
22CSE213	Introduction to Information Technology	3L	-	3	30	70	100	3*
	Total	20	12	21	210	490	700	22 + 3*

*** Not included for CGPA.**

III Semester M.Sc. Computer Science								
Course Code	Courses	Theory Hours/ Week	Practical Hours/ Week	Duration of exams (Hours)	Marks & Credits			
					IA	Exam	Total	Credits
HARD CORE								
22CSH301	Artificial Intelligence and Machine Learning	4L	-	3	30	70	100	4
22CSH302	Principles of Cyber Security	4L	-	3	30	70	100	4
22CSH303	Software Engineering	4L	-	3	30	70	100	4
SOFT CORE [Only ONE course shall be selected from the list of courses]								
22CSS304	Information Retrieval Systems	4L	-	3	30	70	100	4
22CSS305	Cloud Computing	4L	-	3	30	70	100	4
22CSS306	Natural Language Processing	4L	-	3	30	70	100	4
22CSS307	Soft Computing Paradigm	4L	-	3	30	70	100	4
22CSS308	Block Chain Management	4L	-	3	30	70	100	4
PRACTICALS [One practical course shall be selected from the list]								
22CSP309	Artificial Intelligence and Machine Learning Lab	-	6	3	30	70	100	3
22CSP310	Principles of Cyber Security Lab	-	6	3	30	70	100	3
22CSP311	Software Engineering Lab	-	6	3	30	70	100	3
22CSM312	Mini Project and Domain Knowledge Seminar	-	6	3	30	70**	100	3
OPEN ELECTIVE								
22CSE313	Data Analytics Tools	3L	-	3	30	70	100	3*
Total		**19**	**12**	**21**	**210**	**490**	**700**	**22 + 3***

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

* Not included for CGPA.

IV SEMESTER M.Sc. Computer Science							
Course Code	Course	Practical Hours/ Week	Duration of Exam (Hrs.)	Marks & Credits			
				IA	Dissertation + Viva-voce Exam	Total	Credits
22CSP401	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**	**22+3***
TOTAL MARKS OF THIRD SEMESTER						**700**	**22+3***
TOTAL MARKS OF FOURTH SEMESTER						**400**	**16**
GRAND TOTAL CREDITS OF ALL THE FOUR SEMESTERS						**2500**	**86+6***

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.	22CSH101	Mathematical Foundation for Computer Science	4
2.	22CSH102	Advanced Data Structures and Algorithms	4
3.	22CSH103	Data Communications and Computer Networks	4
4.	22CSH104	Advanced Operating Systems	4
5.	22CSH201	Internet of Things	4
6.	22CSH202	Principles of Data Science	4
7.	22CSH203	Advanced Database Management Systems	4
8.	22CSH301	Artificial Intelligence and Machine Learning	4
9.	22CSH302	Principles of Cyber Security	4
10	22CSH303	Software Engineering	4
11	22CSP401	Dissertation and viva voce examination	16
TOTAL			56

Soft Core Courses			
Sl. No.	Course Code	Course Title	Total Credits
1.	22CSS105	. Net Technology	4
2.	22CSS106	Android Programming	
3.	22CSP107	Computer Graphics and Multimedia	
4.	22CSP108	Advanced Data Structures Lab	3+3
5.	22CSP109	. Net Technology Lab	
6.	22CSP110	Android Programming Lab	
7.	22CSP111	Computer Graphics and Multimedia Lab	
8.	22CSS204	Image Processing	4
9.	22CSS205	Big Data Analytics	
10.	22CSS206	Wireless Sensor Networks	
11.	22CSS207	Mobile Computing	
12.	22CSS208	Embedded Systems	
13.	22CSP209	Principles of Data Science	3+3
14.	22CSP210	Internet of Things Lab	

15.	22CSP211	Image Processing Lab	
16.	22CSP212	Big Data Analytics Lab	
17.	22CSS304	Information Retrieval Systems	4
18.	22CSS305	Cloud Computing	
19.	22CSS306	Natural Language Processing	
20.	22CSS307	Soft Computing Paradigm	
21.	22CSS308	Block Chain Management	
22.	22CSS309	Artificial Intelligence & Machine Learning Lab	3
23.	22CSP310	Principles of Cyber Security Lab	
24.	22CSP311	Software Engineering Lab	
25.	22CSM312	Mini Project and Domain Knowledge Seminar	3
Total			**30**

Open Elective Courses			
Sl. No.	**Course Code**	**Course Title**	**Total Credits**
1	22CSE213	Introduction to Information Technology	3*
2	22CSE313	Data Analytics Tools	3*
Total			**6***

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

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