MANGALORE  **UNIVERSITY**

Credits Pattern, Scheme of Examination and Syllabus for Master of Science in Computer Science 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
AUGUST - 2020

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

PREAMBLE:

The University Grants Commission, New Delhi has directed all Universities in the Country to implement the Choice Based Credit System (CBCS Semester Scheme) in both the Undergraduate and Post-Graduate Programmes. The Higher Education Council, Government of Karnataka also considered the implementation of CBCS. Mangalore University has directed all the P.G. Board of Studies to frame the new syllabus for the P.G. Programmes as per the new regulations governing the Choice Based Credit System for the Two Year (Four Semester) Post - Graduate Programmes. Accordingly the internal members of P.G. Board of Studies in Computer Science prepared draft syllabus. The syllabus is placed before the P.G. Board of Studies. The P.G. Board of Studies in Computer Science thoroughly discussed, modified and finalised the draft syllabus.

The present M.Sc. in Programme (Computer Science) under CBCS - PG Scheme has total credits of 92 [Hard Core credits: 56 (60.87%), Soft Core credits: 30 (32.60%) and Open Elective credits: 06 (6.52%)].

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								
CSH101	Mathematical Foundations of Computer Science	4L	-	3	30	70	100	4
CSH102	Advanced Data Structures and Algorithms with C++	4L	-	3	30	70	100	4
CSH103	Data Communications and Computer Networks	4L	-	3	30	70	100	4
CSH104	Advanced Operating Systems	4L	-	3	30	70	100	4
SOFT CORE [Any ONE course shall be selected from the list of courses]								
CSS105	.Net Technology	4L	-	3	30	70	100	4
CSS106	Android Programming	4L	-	3	30	70	100	4
PRACTICALS [Two practical courses should be selected from the list]								
CSP107	Advanced Data Structures Lab	-	6	3	30	70	100	3
CSP108	.Net Technology Lab	-	6	3	30	70	100	3
CSP109	Android Programming 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								
CSH201	Internet of Things	4L	-	3	30	70	100	4
CSH202	Data Science with Python	4L	-	3	30	70	100	4
CSH203	Advanced Database Management Systems	4L	-	3	30	70	100	4
SOFTCORE [Any ONE course shall be selected from the list of courses]								
CSS204	Image Processing	4L	-	3	30	70	100	4
CSS205	Computer Graphics and Multimedia with Java	4L	-	3	30	70	100	4
CSS206	Wireless Sensor Networks	4L	-	3	30	70	100	4
CSS207	Mobile Computing	4L	-	3	30	70	100	4
CSS208	Embedded Systems	4L	-	3	30	70	100	4
PRACTICAL [Two practical courses should be selected from the list]								
CSP209	ADBMS Lab	-	6	3	30	70	100	3
CSP210	Internet of Things Lab	-	6	3	30	70	100	3
CSP211	Image Processing Lab	-	6	3	30	70	100	3
CSP212	Computer Graphics and Multimedia Lab	-	6	3	30	70	100	3
OPEN ELECTIVE								
CSE213	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								
CSH301	Artificial Intelligence & Machine Learning	4L	-	3	30	70	100	4
CSH302	Principles of Cyber Security	4L	-	3	30	70	100	4
CSH303	Software Engineering	4L	-	3	30	70	100	4
SOFT CORE [Only ONE course shall be selected from the list of courses]								
CSS304	Information Retrieval Systems	4L	-	3	30	70	100	4
CSS305	Cloud Computing	4L	-	3	30	70	100	4
CSS306	Natural Language Processing	4L	-	3	30	70	100	4
CSS307	Soft Computing Paradigm	4L	-	3	30	70	100	4
CSS308	Block Chain Management	4L	-	3	30	70	100	4
CSS309	Big Data Analytics	4L	-	3	30	70	100	4
PRACTICALS [One practical course shall be selected from the list]								
CSP310	Artificial Intelligence & Machine Learning Lab	-	6	3	30	70	100	3
CSP311	Big Data Analytics Lab	-	6	3	30	70	100	3
CSM312	Mini Project and Domain Knowledge Seminar	-	6	3	30	70**	100	3
OPEN ELECTIVE								
CSE313	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 Exam	Total	Credits
CSP401	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	**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 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.	CSH101	Mathematical Foundation for Computer Science	4
2.	CSH102	Advanced Data Structures and Algorithms with C++	4
3.	CSH103	Data Communications and Computer Networks	4
4.	CSH104	Advanced Operating Systems	4
5.	CSH201	Internet of Things	4
6.	CSH202	Data Science with Python	4
7.	CSH203	Advanced Database Management Systems	4
8.	CSH301	Artificial Intelligence & Machine Learning	4
9.	CSH302	Principles of Cyber Security	4
10	CSH303	Software Engineering	4
11	CSP401	Project Work [Dissertation with Project viva voce examination]	16
TOTAL			56

Soft Core Courses			
Sl. No.	Course Code	Course Title	Total Credits
1.	CSS105	. Net Technology	4
2.	CSS106	Android Programming	
3.	CSP107	Advanced Data Structures Lab	3+3
4.	CSP108	. Net Technology Lab	
5.	CSP109	Android Programming Lab	
6.	CSS204	Image Processing	4
7.	CSS205	Computer Graphics and Multimedia with Java	
8.	CSS206	Wireless Sensor Networks	
9.	CSS207	Mobile Computing	
10.	CSS208	Embedded Systems	
11.	CSP209	ADBMS Lab	3+3
12.	CSP210	Internet of Things Lab	
13.	CSP211	Image Processing Lab	

14.	CSP212	Computer Graphics and Multimedia Lab	
15.	CSS304	Information Retrieval Systems	4
16.	CSS305	Cloud Computing	
17.	CSS306	Natural Language Processing	
18.	CSS307	Soft Computing Paradigm	
19.	CSS308	Block Chain Management	
20.	CSS309	Big Data Analytics	
21.	CSP310	Artificial Intelligence & Machine Learning Lab	3
22.	CSP311	Big Data Analytics Lab	
23.	CSM312	Mini Project and Domain Knowledge Seminar	3
Total			**30**

Open Elective Courses			
Sl. No.	**Course Code**	**Course Title**	**Total Credits**
1	CSE213	Introduction to Information Technology	3*
2	CSE313	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%)