Semester Wise Study Plan for Two-Year MS (CS) Program

For Graduates having BS (CS) or Equivalent Degree

MS Computer Science Program

The Master of Science in Computer Science program provides students the opportunity to combine a sound foundation in Computer Science with concentrated knowledge in the latest developments in particular areas. The program provides preparation in the advanced principles and processes of computation and training in applying these principles in application areas in industry, science, government, and business. The program emphasizes on course work along with practical assignments and research project.

The two-year MS Computer Science program consists of four core courses, and four electives from various areas of specializations.

5. Eligibility Criteria

For Graduates having BS(CS) or Equivalent Degree

- BS (CS) 4 Years Degree Program (min 130 credit hours), or
- Computer Science Conversion Course 2 Years Degree Program referred to as "MCS" or "MSc (CS)".
- BCS-3 years Degree Program - Student will be required to complete the deficiency of difference of total earned credit hours and 130 credit hours.
- 16 year Science and Engineering graduates in computing or related discipline are eligible to apply but they have to cover deficiency.

The following core courses are to be completed before entering the MS (CS) program.

1. Analysis of Algorithms
2. Assembly Lang. / Computer Architecture
3. Computer Networks
4. Computer Programming
5. Data Structures
6. Database Systems
7. Operating Systems
8. Software Engineering
9. Theory of Automata

A student selected for admission having deficiency in the above stated courses will be required to study a maximum of FOUR courses, which must be passed in the first two semesters. Deficiency courses shall be determined by the Graduate Studies Committee, before admitting the student. A student cannot register in MS courses, unless all specified deficiency courses have been passed.

6. Degree Title

The title of degree is **"Master of Science in Computer Science" (MS-CS).**

7. Distribution of total credit hours & core courses

Category or Area	Credit Hours
Core	13
Electives	12
Thesis	06
Total Credit Hours	**31**

Important Notes:

1. Registration in "MS Thesis " is allowed to a student as per given condition:
   (i) Earned at least 18 credits
   (ii) Passed the "Research Methodology" course; AND
   (iii) CGPA is equal to or more than 2.5.
2. Students are expected to select at least two elective courses from the Specialization area. Other two elective courses may be selected from other specialization areas as offered.
3. Due to the advanced nature of the MSCS program and research orientation, the instructor of a course can re-design the objectives and contents of the course in consultation with the Chair Department.

MS Computer Science (Spring 2023 & Onwards)

8. Semester Wise Study Plan

S. #	Course Code	Course Title	Credit Hours
Semester – I			
1	CS 710	Research Methodology (Core)	1
2	CS 742	Advanced Theory of Automata (Core)	3
3	CS 775	Advanced Computer Architecture (Core)	3
4	CS XXX	Elective-I	3
Semester Cr. Hrs.			10
Semester – II			
1	CS 741	Advanced Analysis of Algorithms (Core)	3
2	CS 752	Advanced Operating Systems (Core)	3
3	CS XXX	Elective-II	3
Semester Cr. Hrs.			9
Semester – III			
1	CS XXX	Elective-III	3
2	CS XXX	Elective-IV	3
3	CS799	Thesis	
Semester Cr. Hrs.			6
Semester –IV			
1	CS799	Thesis	6
Semester Cr. Hrs.			6
Total Cr. Hrs.			**31**

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Computer Science Post Graduate Elective Courses

Spring 2023 and Onwards.

S.no	Code	Course Title	Cr. Hrs.
1.	CS-700	Advanced Knowledge-based Systems	3-0-3
2.	CS-701	Advanced Data Science	3-1-4
3.	CS-702	Applied Deep Learning	3-0-3
4.	CS-703	Applied Natural Language Processing	3-0-3
5.	CS-705	Advanced Artificial Intelligence	3-0-3
6.	CS-801	Special Topics in Decision Support Systems	3-0-3
7.	CS-802	Advanced Topics in Robotics	3-0-3
8.	CS-809	Advanced Natural Language Processing	3-0-3
9.	CS-611	Cryptography	3-0-3
10.	CS-612	Data Privacy	3-0-3
11.	CS-711	Advanced Topics in Digital Forensics	3-0-3
12.	CS-712	Computational Intelligence	3-0-3
13.	CS-717	Statistical and Mathematical Methods for Data Analysis	3-0-3
14.	CS-718	Computer and Mathematical Modelling	3-0-3
15.	CS-716	Advanced Ethical Hacking	3-0-3
16.	CS-813	Special Topics in Cryptography	3-0-3
17.	CS-814	Special Topics in Mathematical Reasoning	3-0-3

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18.	CS-815	Blockchain Security	3-0-3
19.	CS-621	Quantum Computing and Information Theory	3-0-3
20.	CS-720	Applied Quantum Communication	3-0-3
21.	CS-726	Distributed Computing	3-0-3
22.	CS-820	Special Topics in Quantum Computing	3-0-3
23.	CS-826	Advanced Distributed Computing	3-0-3
24.	CS-630	Cloud Computing	3-0-3
25.	CS-634	Network Security	3-0-3
26.	CS-638	Wireless Networks	3-0-3
27.	CS-731	Cooperative Communication Networks	3-0-3
28.	CS-733	Optimization Theory for Computing	3-0-3
29.	CS-734	Advanced Network Security	3-0-3
30.	CS-736	Network Forensics	3-0-3
31.	CS-737	Advanced Topics in Wireless Networks	3-0-3
32.	CS-738	Internet of Things Design and Application	3-0-3
33.	CS-739	Advanced Wireless Systems and Networks	3-0-3
34.	CS-835	Special Topics in Computer Networks	3-0-3
35.	CS-836	Special Topics in Internet of Things	3-0-3
36.	CS-837	Special Topics in Cloud Computing	3-0-3
37.	CS-748	Advanced Evolutionary Computational Techniques	3-0-3
38.	CS-749	Blockchain Applications	3-0-3
39.	CS-840	Reinforcement Learning	3-0-3
40.	CS-651	Software Engineering	3-0-3

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41.	CS-652	System Programming	3-0-3
42.	CS-653	Software Engineering and Formal Specifications	3-0-3
43.	CS-750	Advanced Formal Methods	3-0-3
44.	CS-851	Special Topics in Software Engineering	3-0-3
45.	CS-669	Machine Learning and Neural Networks	3-0-3
46.	CS-762	Text Mining	3-0-3
47.	CS-763	Advanced Neural Networks	3-0-3
48.	CS-861	Advanced Topics in Machine Learning	3-0-3
49.	CS-864	Special Topics in Computational and Fuzzy Intelligence	3-0-3
50.	CS-674	Embedded Computer Systems	3-0-3
51.	CS-774	Advanced Computer Vision	3-0-3
52.	CS-773	Information Visualization	3-0-3
53.	CS-777	Advanced Geographic Information System	3-0-3
54.	CS-778	Medical Image Analysis	3-0-3
55.	CS-876	Special Topics in Computer Vision	3-0-3
56.	CS-682	Tools and Techniques for Data Science	3-0-3
57.	CS-684	Data Mining and Warehousing	3-0-3
58.	CS-685	Information Retrieval Techniques	3-0-3
59.	CS-780	Graph Theory and Algorithms	3-0-3
60.	CS-787	Advanced Topics in Big Data Analytics	3-0-3
61.	CS-886	Time Series Analysis of Big Data	3-0-3
62.	CS-698	Image Processing	3-0-3

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63.	CS-699	Multimedia and Hypermedia Systems	3-0-3
64.	CS-790	Advanced Topics in Mathematical Modelling for Computer Science	3-0-3
65.	CS-890	Advanced Topics in Image Processing	3-0-3

List of core MS/elective PhD courses

Sr	Code	Course Title	Cr. Hrs.
1	CS-710	Research Methodology	3-0-3
2	CS-741	Advanced Analysis of Algorithms	3-0-3
3	CS-742	Advanced Theory of Automata	3-0-3
4	CS-752	Advanced Operating Systems	3-0-3
5	CS-775	Advanced Computer Architecture	3-0-3

List of equivalent/relevant courses for Post Graduate program

Sr	Code	Course Title	Equivalent Code	Equivalent Course	Cr. Hrs.
1.	CS-611	Cryptography	SY-623	Cryptography	3-0-3
2.	CS-612	Data Privacy	DS-603	Data Privacy	3-0-3
3.	CS-630	Cloud Computing	DS-722	Cloud Computing	3-0-3
4.	CS-651	Software Engineering	SE-600	Advanced Software Engineering	3-0-3
5.	CS-669	Machine Learning and Neural Networks	AI-631/DS-650/SE-651/GM-662/SY-609	Machine Learning	3-0-3

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6.	CS-674	Embedded Computer Systems	SY-602	Embedded Systems	3-0-3
7.	CS-698	Image Processing	AI-602	Image Processing	3-0-3
8.	CS-702	Applied Deep Learning	DS-752	Deep Learning	3-0-3
9.	CS-703	Applied Natural Language Processing	DS-753	Natural Language Processing	3-0-3
10.	CS-711	Advanced Topics in Digital Forensics	CY-825	Advanced Topics in Computer Forensics	3-0-3
11.	CS-717	Statistical and Mathematical Methods for Data Analysis	DS-601	Statistical and Mathematical Methods for Data Analysis	3-0-3
12.	CS-734	Advanced Network Security	CY-734	Advanced Network Security	3-0-3
13.	CS-736	Network Forensics	CY-622	Network Forensics	3-0-3
14.	CS-774	Advanced Computer Vision	GM-661/AI-703	Computer Vision/ Computer Vision: From Theory to Application	3-0-3
15.	CS-813	Special Topics in Cryptography	CY-744	Advanced Topics in Cryptography	3-0-3

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