Annexure-IV
Schema of Studies
for
MS in Computer Science (CS)

(Spring 2026)

Program Objectives:

The MS (Computer Science) comprises both coursework as well as a research component. There are four 'core courses' aimed at strengthening the understanding and competence of students in computer science fundamentals. The University expects its MS graduates to pursue careers either as 'Computer Science Faculty Members' or as 'Software Development Managers' in the industry.

Learning Outcomes:

1. Students will be able to possess advanced knowledge of Computer Science field
2. Students will be able to think creatively and critically; to solve non-trivial problems
3. Students will be able to use computing knowledge to develop efficient solutions for real-life problems
4. Students will be able to design solutions and can conduct research-related activities

Eligibility:

Degree in the relevant subject, earned from a recognized university after 16 years of education with at least 60% marks or CGPA of at least 2.0 (on a scale of 4.0).

The following core courses are recommended 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 a deficiency in the above-stated courses may 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.

A student has the option to pursue MS by undertaking either a 6 credit-hour MS Thesis OR a three-credit-hour taught course and a three-credit-hour MS Project.

➢ Distribution of Total Credit Hours (MS with Thesis)

Category of Area	Credit Hours
Core Courses	12
Elective Courses	12
General Elective (Understanding of Quran – I & II)	2
General Elective(Research Methodology)	3
Thesis	06
Total Credit Hours	35

➢ Distribution of Total Credit Hours (MS with Coursework)

Category of Area	Credit Hours
Core Courses	12
Elective Courses	18
General Elective (Understanding of Quran – I & II)	2
General Elective (Research Methodology)	03
Total Credit Hours	35

Semester-wise Plan for MS (CS) with Thesis (Credit Hours: 35)

Semester I (Credit hrs.: 10)

Course Title	Credits Hours
MS Core-I	3
MS Core-II	3
Elective-I	3
General Elective-I(Understanding of Quran – I)	1(0+1)
Total	**10**

Semester II (Credit hrs.: 10)

Course Title	Credits Hours
MS Core-III	3
MS Core-IV	3
General Elective-II(Understanding of Quran – II)	1(0+1)
General Elective-III(Research Methodology	3
Total	**10**

Semester III (Credit hrs.: 9)

Course Title	Credits Hours
Thesis – I	3
Elective-II	3
Elective-III	3
Total	**9**

Semester IV (Credit hrs.: 6)

Course Title	Credits Hours
Thesis – II*	3
Elective-IV	3
Total	**6**

Registration in "MS Thesis - I" is allowed provided the student has

a. Earned at least 20 credits

b. Passed the "Research Methodology" course; AND

c. CGPA is equal to or more than 2.5.

Semester-wise Plan for MS (CS) with Coursework (Credit Hrs.: 35)

Note: All courses have 3 credits each

Semester I (Credit hrs.: 10)

Course Title	Credits Hours
MS Core-I	3
MS Core-II	3
Elective-I	3
General Elective-I(Understanding of Quran – I)	1(0+1)
Total	**10**

Semester II (Credit hrs.: 10)

Course Title	Credits Hours
MS Core-III	3
MS Core-IV	3
General Elective-II(Understanding of Quran – I)	1(0+1)
General Elective-III	3
Total	**10**

Semester III (Credit hrs.: 9)

Course Title	Credits Hours
Elective-II	**3**
Elective-III	3
Elective-IV	3
Total	**9**

Semester IV (Credit hrs.: 6)

Course Title	Credits Hours
Elective-V	3
Elective-VI	3
Total	**6**

MS in Computer Science

➢ Core Courses for MS in Computer Science (Credit hrs.: 12)

Course Code	Course Title	Credit Hours	Expected Offering
CSC-501	Advanced Analysis of Algorithms	3	Fall / Spring
CSC-505	Advanced Operating Systems	3	Fall / Spring
CSC-524	Theory of Automata – II	3	Fall / Spring
CSC-527	Theory of Programming Languages	3	Fall/Spring

➢ General Elective Course (Credit hrs.: 5)

Course Code	Course Title	Credit Hours	Expected Offering
GEC-592	General Elective-I (Understanding of Quran – I)	1(0+1)	Fall / Spring
GEC-591	General Elective-II (Understanding of Quran – II)	1(0+1)	Fall / Spring
CSC-513	General Elective-III (Research Methodology)	3	Fall / Spring

➢ MS Thesis (Credit hrs.: 6)

Course Code	Course Title	Credit Hours	Expected Offering
CSC-691	MS Thesis	6	Fall / Spring

Elective Courses for MS Computer Science[1]

Course Code	Course Name	Course Type	CH	Track
CSC-561	Advanced Artificial Intelligence	General Electives	3	Artificial Intelligence
CSC-658	Advanced Blockchain	General Electives	3	Net-Centric Computing
CSC-551	Advanced Computer Networks	General Electives	3	Net-Centric Computing
CSC-651	Advanced Data Communications	General Electives	3	Net-Centric Computing
CSC-631	Advanced Data Mining and Data Ware Housing	General Electives	3	Information Management
CSC-531	Advanced Database Systems	General Electives	3	Information Management
CSC-543	Advanced Distributed Computing	General Electives	3	Net-Centric Computing
SWE-606	Advanced Formal Methods	Domain Core	3	Software Engineering
CSC-528	Advanced Human Computer Interaction	General Electives	3	Human Computer Interaction
CSC-672	Advanced Natural Language Processing	Domain Core	3	Artificial Intelligence
CSC-540	Advanced Network Security and Cryptography	General Electives	3	Net-Centric Computing
SWE-601	Advanced Requirements Engineering	Domain Core	3	Software Engineering
SWE-581	Advanced Software Engineering	General Electives	3	Software Engineering
SWE-608	Advanced Software Project Management	Domain Electives	3	Software Engineering
SWE-602	Advanced Software System Architecture	Domain Core	3	Software Engineering
SWE-573	Advanced Topics in Software Engineering	General Electives	3	Software Engineering
SWE-610	Agent Based Modeling	General Electives	3	Software Engineering
SWE-607	Agile Software Development Methods	Domain Electives	3	Software Engineering
CSC-535	Artificial Neural Networks	General Electives	3	Artificial Intelligence
CSC-517	Automatic machine learning	General Electives	3	Artificial Intelligence
CSC-633	Big Data Analytics	General Electives	3	Information Management
SWE-634	Business Process Re-Engineering	General Electives	3	Software Engineering
CSC-656	Complex Networks	Domain Electives	3	Net-Centric Computing
SWE-605	Component Based Software Engineering	Domain Electives	3	Software Engineering
CSC-662	Computational Intelligence	General Electives	3	Artificial Intelligence
CSC-520	Computer Integrated Manufacturing	General Electives	3	Artificial Intelligence
CSC-527	Computer Vision	Domain Core	3	Artificial Intelligence
CSC-674	Computer Vision and Machine Learning	General Electives	3	Artificial Intelligence
CSC-655	Cyber Security	General Electives	3	Net-Centric Computing
CSC-515	Data mining	General Electives	3	Artificial Intelligence
CSC-634	Data Science	General Electives	3	Data Science
CSC-514	Deep learning	General Electives	3	Artificial Intelligence
CSC-553	Digital Image Processing	General Electives	3	Artificial Intelligence
CSC-644	Distributed and Cloud Computing	General Electives	3	Net-Centric Computing
CSC-532	Distributed Database Systems	General Electives	3	Information Management
SWE-609	Empirical Software Engineering	Domain Electives	3	Software Engineering
SWE-571	Experimentations in Software Engineering	General Electives	3	Software Engineering
SWE-643	Formal Methods in Software Engineering	General Electives	3	Software Engineering
CSC-518	Fuzzy logic	General Electives	3	Artificial Intelligence
CSC-641	Grid and Cluster Computing	General Electives	3	Net-Centric Computing
CSC-523	Human Body system	General Electives	3	Artificial Intelligence
SWE-672	Human Capital & Organizational Behavior	General Electives	3	Software Engineering

[1] Electives (Specialized Areas)-Not limited to the list given above/Subject to the availability of the Faculty

Course Code	Course Name	Course Type	CH	Track
CSC-512	Information retrieval	General Electives	3	Artificial Intelligence
CSC-554	Information Security	General Electives	3	Net-Centric Computing
CSC-519	Internet of things	General Electives	3	Artificial Intelligence
CSC-529	Introduction to Robotics	General Electives	3	Artificial Intelligence
SWE-541	Knowledge Based Software Engineering	General Electives	3	Software Engineering
CSC-534	Knowledge Discovery and Data Mining	General Electives	3	Intelligent Systems
CSC-539	Knowledge Representation & Reasoning	Domain Core	3	Artificial Intelligence
CSC-572	Machine Learning	General Electives	3	Artificial Intelligence
SWE-551	Machine Learning Applications for Software Engineering	General Electives	3	Software Engineering
CSC-653	Mobile Computing	General Electives	3	Net-Centric Computing
CSC-673	Multimedia and Image Mining	General Electives	3	Artificial Intelligence
CSC-652	Network Design and Management	General Electives	3	Net-Centric Computing
CSC-552	Network Risk Management	General Electives	3	Net-Centric Computing
CSC-642	Parallel Computing	General Electives	3	Net-Centric Computing
CSC-516	Pattern Recognition	General Electives	3	Artificial Intelligence
CSC-675	Probabilistic Reasoning	General Electives	3	Intelligent Systems
CSC-525	Programming for Artificial Intelligence	General Electives	3	Artificial Intelligence
CSC-676	Quantum Computing	General Electives	3	Intelligent Systems
SWE-613	Reliability Engineering	General Electives	3	Software Engineering
CSC-513	Research Methodology	Domain Supporting	3	Computer Science
CSC-533	Semantic Web	General Electives	3	Intelligent Systems
SWE-611	Software Configuration Management	General Electives	3	Software Engineering
SWE-642	Software Configuration Management	General Electives	3	Software Engineering
SWE-633	Software Costing and Estimation	General Electives	3	Software Engineering
SWE-531	Software Development: Tools & Engineering	General Electives	3	Software Engineering
SWE-561	Software Engineering Ontologies	General Electives	3	Software Engineering
SWE-604	Software Measurement and Metrics	Domain Electives	3	Software Engineering
SWE-532	Software Process Management and Metrics	General Electives	3	Software Engineering
SWE-521	Software Project Management	General Electives	3	Software Engineering
SWE-523	Software Quality Assurance and Management	General Electives	3	Software Engineering
SWE-522	Software Requirement Engineering	General Electives	3	Software Engineering
SWE-635	Software Risk Management	Domain Electives	3	Software Engineering
CSC-536	Software System Design and Architecture	General Electives	3	Software Engineering
SWE-603	Software Testing and Quality Assurance	Domain Core	3	Software Engineering
SWE-582	Software Verification and Validation	General Electives	3	Software Engineering
CSC-530	Space Robotics	General Electives	3	Artificial Intelligence
CSC-632	Spatio/Temporal Database Systems	General Electives	3	Information Management
CSC-526	Speech Signal Processing	General Electives	3	Artificial Intelligence
CSC-537	Theory of Programming Language	Domain Core	3	Artificial Intelligence
CSC-542	Ubiquitous and Pervasive Computing	General Electives	3	Net-Centric Computing
CSC-657	Wireless Sensor Networks	General Electives	3	Net-Centric Computing
CSC-658	Generative Artificail Intelligence	General Electives	3	Net-Centric Computing
CSC-659	Large Languages Models	General Electives	3	Net-Centric Computing