Syllabus

M.Sc. (Computer Science)

(FOUR - SEMESTER PROGRAM)

Effective from session (2020-21)

DEPARTMENT OF COMPUTER SCIENCE

UNIVERSITY OF LUCKNOW
LUCKNOW-226007

Department of Computer Science
University of Lucknow, Lucknow
M. Sc. (Computer Science): Four semesters Program
Choice Based Credit System (CBCS)
(Course Structure and Syllabus)

Objective of the Program

M.Sc. in computer science is four semesters self finance/Regular program with total 96 credits and 2400 marks. This four semester program is focused on academic, research and application which follows directives of UGC/MHRD.

Objective of program is to prepare students with the knowledge in the field of ICT such as Software engineering, Network Security, Cyber security, Data Science and Artificial Intelligence etc. This program contains wide range of advance courses and emerging technologies. To enable students pursue a professional career in academia, research and software industries.

Total Course Credit: 96 and Total Course Marks: 2400

Details of Semesters are as :

Semester-I

Semester Credits: 24   **Total Semester Marks: 600**

Paper No.	Course code	L-T-P	Credits	Theory Paper & Practical Labs	Internal Marks	Semester Marks	Max Marks
Paper-1	MCS 101	3-1-0	4	Database (oracle)	30	70	100
Paper-2	MCS 102	3-1-0	4	Data warehouse and Data mining	30	70	100
Paper-3	MCS 103	3-1-0	4	Theory of Computation	30	70	100
Paper-4	MCS 104	3-1-0	4	Information Security	30	70	100
Practical	MCS 105	0-0-8	4	Lab based on MCS 101	30	70	100
Practical	MCS 106	0-0-8	4	Lab based on MCS 102	30	70	100

Semester-II

Semester Credits: 24   **Total Semester Marks: 600**

Paper No.	Course code	L-T-P	Credits	Theory Paper & Practical Labs	Internal Marks	Semester Marks	Max Marks
Paper-1	MCS 201	3-1-0	4	Advance Operating System	30	70	100
Paper-2	MCS 202	3-1-0	4	Software Engineering	30	70	100
Paper-3	MCS 203	3-1-0	4	Compiler Design	30	70	100
Paper-4	MCS 204*	3-1-0	4	Value Added Courses	30	70	100
Paper-5	MCS 205*	Self Study	Non-credit	Skill-based Course	--	--	Satisfactory grade
Practical	MCS 206	0-0-8	4	Lab based on MCS 201 and MCS 202	30	70	100
Practical	MCS 207	0-0-8	4	Lab based on MCS 203	30	70	100

Entrepreneurship

For M.Sc. Computer Science students entrepreneurship training during vacation after second semester will be mandatory. Assessment will be done in third semester for four credits with 100 marks.

Semester-III

Semester Credits: 28   **Total Semester Marks: 700**

Paper No.	Course code	L-T-P	Credits	Theory Paper & Practical Labs	Internal Marks	Semester Marks	Max Marks
Paper-1	MCS 301	3-1-0	4	Computer Network	30	70	100
Paper-2	MCS 302	3-1-0	4	Computer Graphics and Image Processing	30	70	100
Paper-3	MCS 303*	3-1-0	4	Elective E-I (Within Department)	30	70	100
Paper-4	MCS 304*	3-1-0	4	Elective E-II (Outside Department) OR MOOC (Massive Open Online Course)	30 Or ------	70 Or ------	100 Or Pass Certificate
Project	MCS 305	0-6-2	4	Minor Project	30	70	100
Practical	MCS 306	0-0-8	4	Lab based on MCS 302	30	70	100
Entrepreneurship Training	MCS 307	-------	4	Entrepreneurship Training Assessment	-------	100	100

Semester-IV

Semester Credits: 20   **Total Semester Marks: 500**

Paper No.	Course code	L-T-P	Credits		Theory Paper & Practical Labs	Internal Marks	Semester Marks	Max Marks
Paper-1	MCS 401*	3-1-0	4		Elective E-I OR Elective from MOOC's Subjects	30 Or ------	70 Or ------	100 Or Pass Certificate
Project	MCS 402	---------	16	10	Major Project : synopsis preparation Dissertation & Contribution in the form of Publication	--------	250	400
				2	Literature Review	50	-----	
				4	Monthly Presentation	100	-----	

List of Elective Papers:

List of Value added courses for the Paper code: MCS 204 in Second semester	List of UGC Approved Skill-based Courses for the paper code: MCS 205 in Second Semester	Elective Papers in Third Semester (E-I) (Within Department) Student shall opt any one subject from given list
MCS-204VA- Project Management MCS-204VB-Constitution of India MCS-204VC-Social Engineering MCS-204VD- Maintenance management	MCS-205SA- Web Technology and Multimedia MCS-205SB- Software Development MCS-205SC- System Administration MCS-205SD- Computer Proficiency in Hardware	MCS-303EA- Cyber Security, MCS-303EB- Internet of Things, MCS-303EC- Data Science MCS-303ED- Artificial Intelligence

Elective Papers in Third Semester (E-II) (Outside Department)	Elective Papers for third Semester (MOOC's/Swayam Subjects)	Elective Papers in Fourth Semester (E-I) Student shall opt any one subject from given list
Student shall Opt one subject from following Department of university. * M.Sc. Third semester in Physics * M.Sc. Third semester in Statistics * M.Sc. Third semester in Mathematics	After completing any one of the following listed or online courses under MOOC's/Swayam (MCS 304)student must submit the self-attested pass/satisfactory certificate to COE office University of Lucknow MCS-304MA-Animation MCS-304MB-Communication Skill MCS-304MC-Academic Writing MCS-304MD-Academic and Research Report MCS-304ME-Advertising and Marketing	MCS-401EA- Big Data Analytics, MCS-401EB- Software Project Management, MCS-401EC- Mobile Computing, MCS-401ED- Advance Programming

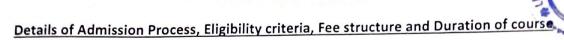| Elective Papers for Fourth Semester (MOOC's/Swayam Subjects) |
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| After completing any one of the following listed or online courses under MOOC's/Swayam (MCS 401)student must submit the self-attested pass/satisfactory certificate to COE office University of Lucknow
MCS-401MA- Web programming with Python and javascript   MCS-401MC- Computer Vision and Image Analysis
MCS-401MB-Introduction to Python for Data Science   MCS-401MD- Ethics and law in Data Analytics |

Details of Admission Process, Eligibility criteria, Fee structure and Duration of course

1. **Admissions:**

    a. There shall be 20 seats for M.Sc. (C.S.) course.

    b. The admission shall be done on the basis of combined score of Entrance Test (50 marks), merit index (High school-10 marks, intermediate/Higher Secondary (i.e , 10+2) level-20 marks, graduation-70 marks) and comprehensive total of all these evaluations will be 150 marks only/ as per university rules

    c. There shall be no weightage of any P.G Degree/Diploma.

    d. The admission test for selecting candidates in this programme will be held every year.

    e. The existing reservation rules of the University shall apply in admitting the students to this course.

    f. Admission on migration of a candidate from any other University to this University shall not be permitted.

2. **Eligibility:**

    For admission to M.Sc.(C.S.) course, a candidate. should have passed B.Sc. (Computer Science /Information Technology/Electronics/Mathematics/Statistics) or BCA .

3. **Fee:** The fees per semester Rs. 15,000.00. (Fifteen Thousand Indian Rupees Only)

4. **Duration of Course:**

    a. The Master of Science (Computer Science) Programme is designed with a special focus on Advance computing technologies and shall be a two-year (Four Semester) full time programme.

    b. The degree of M.Sc. (C.S.) of the University of Lucknow shall be conferred on the candidate who pursues the prescribed course of study for four semesters and passes the examinations as prescribed under the relevant ordinances.

Outcomes of the Program

Outcomes of the program M.Sc. in Computer Science:

(a) Apply knowledge of computer science theory to produce computing-based solutions.
(b) Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions.
(c) Write technical reports and technical papers.
(d) Develop information/management systems for various application and research papers.

Program Specific Outcomes

Students of M.Sc. Computer Science will have the ability to

(a) Communicate computer science concepts, design and solutions effectively and professionally.
(b) Apply knowledge of computing to produce effective designs and solutions for specific problems.
(c) Use software development tools, software systems, and modern computing platforms.