Teaching Scheme

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Detailed Syllabus

For

Master of Computer Applications

(Total Credits: 96- 100)

Duration: 2 Years

(Multiple Exit and Entry Options)

SYLLABUS

(2024-25)

School of Computational Sciences and Engineering
Faculty of Engineering, Applied Science and Technology

SHOBHIT INSTITUTE OF ENGINEERINGAND TECHNOLOGY,
(Deemed to be University)
NH-58 Modipuram, Meerut, (U.P.) 250110
Website: www.shobhituniversity.ac.in

School of Computational Sciences and Engineering

Master of Computer Applications (MCA)

Vision of School

To be a recognized leader in quality technical education, fostering extensive research, and equipping students with cutting-edge technological skills and practical experience to tackle challenges in the rapidly evolving computing industry and academia for societal betterment.

Mission of School

M1. To provide quality education in Computer Science &Engineering.

M2. To deploy students potential in innovation, multidisciplinary research & development.

M3. To impart professional ethics, social responsibilities and entrepreneur skills to the students.

Program Educational Objectives (PEOs):

The graduate of the program will be able to-

PEO1: Apply domain knowledge, abstraction and conceptualization of computing models from defined problems and requirements.

PEO2: Equip themselves with techniques of design of experiments, analysis and interpretation of data and synthesis of information to provide a valid conclusion.

PEO3: Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

Program Outcomes:

PO1	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.	Computational Knowledge
PO2	Identify, formulate, research literature, and solve *complex* computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.	Problem Analysis

PO3	Design and evaluate solutions for *complex* computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.	Design /Development of Solutions
PO4	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide validconclusions.	Conduct Investigations of Complex Computing Problems
PO5	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to *complex* computing activities, with an understanding of the limitations.	Modern Tool Usage
PO6	Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.	Professional Ethics
PO7	Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.	Life-long Learning
PO8	Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	Project management and finance
PO9	Communicate effectively with the computing community, and with society at large, about *complex* computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.	Communication Efficacy
PO10	Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.	Societal and Environmental Concern
PO11	Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.	Individual and Team Work
PO12	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.	Innovation and Entrepreneurship

Program Specific Outcomes:

Student will

PSO1: Become technology-oriented with the knowledge and ability to develop creative solutions, and better understand the effects of future developments of computer systems and technology on people and society as a whole.

PSO2: Inculcate the knowledge of Information Security /IoT/ Cloud Computing/ Advance Computing / Data Science & Machine Learning principles to manage projects effectively and create innovative career path

SUMMARY OF SEMESTER CREDITS

Course Type	I	II	III	IV	Total
Core Course (CC)	19	13	13		45
Discipline Specific Elective (DSE)	_	8	8		16
Skill Enhancement Course (SEC)	2	2	3		7
MDC	2	_	_		2
Internship	2	2	2		6
Project	_	-	-	20	20
Total	25	25	26	20	96
For Exit Option Additional Credits (MOOCS/NPTEL/Workshop)	2	2			4
Total (with additional credits)	27	27	26	20	100
Exit Options		**PG Diploma A candidate with a Diploma in Computational Sciences and Engineering**		**PG Degree/MCA A candidate with 2 yrs. Master's Degree in Computer Applications**	
Entry Options		•A 4 years Bachelor's degree (Honours / Research) for the 1-year/2-semester Master's programme. • A 3 years Bachelor's degree for the 2-year/4-semester Master's degree programme. • A 4-year Bachelor's Degree for the 1-year/2- semester master's programme. • Admission to a programme of study leading to the Master's degree is open to those who have met the entrancerequirements, including specified levels of attainment, specified in the programme admission regulations. Admission will be based on the evaluation of documentary evidence (including the academic record and/or evidence relating to the assessment and certification of prior learning) indicating the applicant's ability to pursue postgraduate study. • A 1-year/2-semester Post-Graduate Diploma programme		• A 1-year/2-semester master's programme builds on a bachelor's degree with Honours/Research and requires total credits in the range of 40-44 credits for individuals who have completed a Bachelor's degree (Honours/Research). •The 2-year/4-semester Master's programme builds on a 3-year/6-semester bachelor's degree and requires a total credits in the range of 80-88 credits from the first and second years of the programme, with 40-44 credits in the first year and 40-44 credits in the second year of the programme at level 9 on the NHEQF. • A 1-year/2-semester Post-Graduate Diploma programme builds on a 3-year/6-semester bachelor's degree and requires 40-44 credits for individuals who have completed a Bachelor's Programme	

Teaching Scheme

Academic session -2024-25

Master of Computer Applications

(Total Credits: 96-100)

First Year: Semester 1

S. No.	Course Type	Course Code	Course Title	L-T-P	Credit Units
1.	Core	T01MCCA0101	Discrete Mathematics and Graph Theory	3-1-0	4
2.	Core	T01MCCA0102	Data Structures and Algorithms	3-1-0	4
3.	Core	T01MCCA0103	Object-Oriented Programming with Java	3-0-0	3
4.	Core	T01MCCA0104	Computer Organization and Architecture	3-1-0	4
5	Core	T01MCCA0105	Database Management System	3-1-0	4
6	MDC	B01MBBM0141	Principles of Management & Communication	2-0-0	2
7	SEC	T01MCCA0160	Java Programming Lab	0-0-2	1
8	SEC	T01MCCA0161	DBMS Lab	0-0-2	1
9	Internship	T01MCCA0190	Internship Project	0-0-4	2
					25

Semester-II

S. No.	Course Type	Course Code	Course Title	L-T-P	Credit Units
1.	Core	T01MCCA0201	Operating Systems	3-1-0	4
2.	Core	T01MCCA0202	Software Engineering and Project Management	3-0-0	3
3.	Core	T01MCCA0203	Web Technologies	3-0-0	3
4.	Core	T01MCCA0204	Advanced Java Programming	3-0-0	3
5.	DSE	T01MCCX02XX	Elective-1	3-0-2	4
6.	DSE	T01MCCX02XX	Elective-2	3-0-2	4
7.	SEC	T01MCCA0260	Web Technologies Lab.	0-0-2	1
8.	SEC	T01MCCA0261	Advanced Java Programming Lab	0-0-2	1
9.	Internship	T01MCCA0290	Internship Project	0-0-4	2
					25

Second Year: Semester-III

Sl.No.	Course Type	Course Code	Course Title	L-T-P	Credit Units
1	Core	T01MCCA0301	Design and Analysis of Algorithm	3-1-0	4
2	Core	T01MCCA0302	Data Communication and Computer Networks	3-0-0	3
3	Core	T01MCCA0303	Artificial Intelligence	3-0-0	3
4	DSE	T01MCCA03XX	Elective 3	3-0-2	4
5	DSE	T01MCCA03XX	Elective 4	3-0-2	4
6	Core	T01MCCA0304	Data Warehousing & Data Mining	2-1-0	3
7	SEC	T01MCCA0360	Data Mining Lab	0-0-2	1
8	SEC	T01MCCA0361	Design and Analysis of Algorithm Lab	0-0-2	1
9	SEC	T01MCCA363	Technical Seminar	0-0-2	1
10	Internship	T01MCCA0390	Internship Project	0-0-4	2
					26

Semester IV

Sl. No.	Course Type	Course Code	Course Title	Credit Units
1.	Project	T01MCCA0496	Project	20
			Total	**20**

Specialization Courses (Elective)

Discipline Specific Elective

Cloud Computing:
1. Cloud Computing Architecture and Management (T01MCCA0230)
2. Cloud Service Models and Applications (T01MCCA0231)
3. Cloud-Based Big Data Analytics (T01MCCA0330)
4. Cloud Security and Privacy (T01MCCL0321)

Internet of Things:
1. Sensor Networks and Data Acquisition (T01MCCA0232)
2. IoT Platforms and Applications (T01MCCA0233)
3. IoT Infrastructure and Services (T01MCCA0332)
4. IoT Security and Privacy (T01MCCA0333)

Network and Information Security:
1. Cryptography and Network Security (T01MCCA0234)
2. Ethical Hacking and Penetration Testing (T01MCCA0235)
3. Mobile and Wireless Network Security (T01MCCA0334)
4. Network Forensics and Incident Response (T01MCCA0335)

Data Science & Machine Intelligence:
1. Data Analytics with Python (T01MCCA0236)
2. Statistical Techniques for Data Analysis (T01MCCA0237)
3. Machine Learning Techniques (T01MCCA0336)
4. Data Visualization and Analytics (T01MCCA0337)

Full Stack Development
1. Introduction to HTML, Bootstrap and CSS (T01MCCA0238)
2. Programming with JavaScript (T01MCCA0239)
3. Node JS and Mongo DB Development (T01MCCA0338)
4. Angular JS Development (T01MCCA0339)