DEPARTMENT OF COMPUTER APPLICATIONS

SMIT, MAJHITAR

Syllabus Schema For

MASTER OF COMPUTER APPLICATIONS (MCA)

[2 Years PG Programme]

[with Lateral Entry to 2nd Year]

Total Credits:

21+21+24+16=82

(2024 BATCH)

Master of Computer Application (MCA)

The AICTE-approved MCA curriculum at SMIT/SMU offers comprehensive education and training for students seeking professional preparation in the applications of computer science. This curriculum covers a broad range of subjects, including programming languages, data structures, data management, software engineering, formal languages and automata theory, operating systems, distributed systems, machine learning, network and information security, data science, cloud computing, artificial intelligence computer networks etc.

SMIT MCA students are equipped for careers in industry and business environments. Upon successful completion of the course, students gain a robust understanding of the field of Computer Applications. They develop a solid foundation in computer applications and technology vocabulary, enabling them to collaborate effectively with professionals from other disciplines. Additionally, they are well-prepared to continue their education and can pursue advanced degree programs such as M. Tech. or Ph.D.

As per AICTE Approval Process Handbook (2024-25 to 2026-27), admission criteria for MCA are:
A. Master of Computer Application [MCA 1st Year]
- Passed any graduation degree (e.g.: B.E. / B.Tech./B.Sc. / B.Com. / B.A./ B. Voc./ BCA etc.,) preferably with Mathematics at 10+2 level or at Graduation level
- Obtained at least 50% marks (45% marks in case of candidates belonging to reserved category) in the qualifying examination.

  (*For students having **no** Mathematics background, compulsory bridge course on Mathematics will be offered by the Department of Computer Applications. Additional bridge courses related to computer subjects may be offered by the department as per the requirements.*).

B. Master of Computer Application [MCA Second Year Lateral Entry]
- B Tech/B.E. (CSE/IT) subject to availability of seats and BCA (4 Years)

MCA Program Objectives are:
- MCA graduates will apply their knowledge and skills to succeed in their career and/or obtain an advanced degree.
- MCA graduates will understand Ethical issues and provide engineering solutions for solving social problems. They will involve as full participants in our profession and our society.
- MCA graduates will demonstrate strong communication skills and the ability to function effectively in multi-disciplinary teams.
- MCA graduates will apply basic principles and practices of computing grounded in mathematics and science to successfully complete software related projects to meet customer business objectives and/or productively engage in research.

MCA Program Educational Objectives (PEO):
- MCA graduates will have a successful career based on their understanding of formal and practical methods of applications development using the concepts of computer programming, software and design principles.
- MCA graduates will be prepared for pursuing higher studies in their related field.
- MCA graduates will demonstrate analytical and design skills including the ability to generate creative solutions and foster team-oriented professionalism.
- MCA graduates will exhibit effective work ethics and be able to adapt to the challenges of dynamic professional environment.

Specializations Offered:
MCA students at Sikkim Manipal Institute of Technology have the opportunity to specialize in Data Science, Cloud Technology, or Cyber Security. These specializations, developed in collaboration with industry and academic experts and aligned with market trends, are available as group electives. Each specialization consists of three theory courses, each worth 3 credits, offered in the II/III semester. Foundational concepts are introduced in the "Latest Trends in Computer Applications" course during the first semester.

MCA SYLLABUS SCHEMA – SEMESTER WISE

	I YEAR - I SEMESTER				
Subject Code	**Subject Title**	**Teaching Department**	**Theory Hours**	**Practical/Tutorial Hours**	**Credit Points**
CA500A1	MATHEMATICAL FOUNDATIONS FOR COMPUTING	MATHS/CA	3L	1T	3
CA501A1	LATEST TRENDS IN COMPUTER APPLICATION	CA	3L	1T	3
CA502A1	DATABASE MANAGEMENT SYSTEM	CA	3L	1T	3
CA503A1	OPERATING SYSTEMS	CA	3L	1T	3
CA504A1	JAVA PROGRAMMING	CA	3L	1T	3
BA000A1	ACCOUNTING AND MANAGERIAL ECONOMICS	MGMT	3L	1T	3
CA505A4	OPERATING SYSTEMS LAB	CA	-	2P	1
CA506A4	JAVA PROGRAMMING LAB	CA	-	2P	1
CA507A4	DATABASE MANAGEMENT SYSTEM LAB	CA	-	2P	1
Total Credits					**21**

	I YEAR - II SEMESTER				
Subject Code	**Subject Name**	**Teaching Department**	**Theory Hours**	**Practical/Tutorial Hours**	**Credit Points**
CA508A1	FORMAL LANGUAGES AND AUTOMATA THEORY	CA	3L	1T	3
CA509A1	UNIX/LINUX INTERNAL	CA	3L	1T	3
CA510A1	.NET FRAMEWORK	CA	3L	1T	3
CA511A1	COMPUTER NETWORK	CA	3L	1T	3
CA***A3	ELECTIVE –I	CA	3L	1T	3
CA***A3	ELECTIVE- II	CA	3L	IT	3
CA512A4	UNIX/LINUX INTERNAL LAB	CA	-	2P	1
CA513A4	COMPUTER NETWORK LAB	CA	-	2P	1
CA514A4	.NET LAB	CA	-	2P	1
Total Credits					**21**

	II YEAR - III SEMESTER				
Subject Code	**Subject Name**	**Teaching Department**	**Theory Hours**	**Practical/Tutorial Hours**	**Credit Points**
MA000A1	QUANTITATIVE ANALYSIS FOR COMPUTER APPLICATIONS	MATHS	3L	1T	3
CA601A1	DESIGN & ANALYSIS OF ALGORITHMS	CA	3L	1T	3
CA602A1	SOFTWARE ENGINEERING AND UNIFIED MODELLING LANGUAGE	CA	3L	1T	3
CA***A3	ELECTIVE-III	CA	3L	1T	3
CA***A3	ELECTIVE-IV	CA	3L	1T	3
CA603A4	SOFTWARE ENGINEERING AND UML LAB	CA	-	2P	1
CA604A4	DESIGN & ANALYSIS OF ALGORITHMS LAB	CA	-	2P	1
CA605A5	MINOR PROJECT	CA	-	-	6
CA606A9	INDUSTRIAL TRAINING / COURSEWORK	CA	-	-	1
Total Credits					**24**

II ND YEAR-IV TH. SEMESTER					
Subject Code	**Subject Name**	**Teaching Department**	**Duration**		**Credit Points**
CA607A6	MAJOR PROJECT	CA/External Agencies	16 weeks	-	16
Total Credits					**16**

LIST OF ELECTIVES IN II SEMESTER (ELECTIVE-I)	
SUB. CODE	**SUBJECT**
CA551A3	BIOINFORMATICS
CA552A3	DIGITAL IMAGE PROCESSING
CA553A3	MANAGEMENT INFORMATION SYSTEM
CA554A3	OPTIMIZATION TECHNIQUE
CA555A3	MOBILE APPLICATION DEVELOPMENT
CA556A3	ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM
CA557A3	IT LAW AND PRACTICES
CA558A3	COMPUTER ORGANIZATION AND ARCHITECTURE
CA559A3	PYTHON PROGRAMMING
CA560A3	ANGULAR JS, REACT JS AND VUE JS

LIST OF ELECTIVES IN II SEMESTER		
SPECIALISATION – GROUP ELECTIVES		
Elective II	**DATA SCIENCE**	
	CA561A3	DATA SCIENCE
	CLOUD TECHNOLOGY	
	CA562A3	CLOUD COMPUTING
	CYBER SECURITY	
	CA563A3	PRINCIPLES OF CYBER SECURITY

LIST OF ELECTIVES IN III SEMESTER		
GROUP ELECTIVES – SPECIALISATION		
Elective III & Elective IV	**DATA SCIENCE**	
	CA651A3	STATISTICAL FOUNDATIONS OF DATA SCIENCE
	CA652A3	DATA WAREHOUSING AND DATA MINING
	CA653A3	DATA ANALYTICS USING PYTHON
	CA654A3	MACHINE LEARNING
	CA655A3	SECURITY AND PRIVACY FOR DATA SCIENCE
	CA656A3	IMAGE ANALYTICS AND VISUALIZATION
	CA657A3	DEEP LEARNING
	CA658A3	NATURAL LANGUAGE PROCESSING
	CA659A3	BIG DATA ANALYTICS
	CA660A3	BUSINESS INTELLIGENCE AND ANALYTICS
	CLOUD TECHNOLOGY	
	CA661A3	SCHEDULING IN CLOUD COMPUTING
	CA662A3	CLOUD ARCHITECTURE AND TECHNOLOGY
	CA663A3	BIG DATA AND ITS APPLICATIONS IN CLOUD
	CA664A3	DISTRIBUTED SYSTEM
	CA665A3	CLOUD COMPUTING AND SECURITY
	CA666A3	EDGE AND FOG COMPUTING
	CA667A3	VIRTUALIZATION CONCEPTS
	CA668A3	CLOUD APPLICATION DEVELOPMENT
	CA669A3	CLOUD ANALYTICS
	CA670A3	PRIVATE CLOUD DEPLOYMENT AND MANAGEMENT

	CYBER SECURITY	
	CA671A3	CRYPTOGRAPHY
	CA672A3	PRIVACY AND SECURITY IN WEB APPLICATION
	CA673A3	NETWORK AND INFORMATION SECURITY
	CA674A3	COMPUTATIONAL NUMBER THEORY & CRYPTOGRAPHY
	CA675A3	INTERNET SECURITY AND PRIVACY
	CA676A3	IOT SECURITY AND PRIVACY
	CA677A3	CLOUD COMPUTING AND SECURITY
	CA678A3	BLOCKCHAIN TECHNOLOGY
	CA679A3	EMBEDDED AND CYBER PHYSICAL SYSTEMS SECURITY
	CA680A3	GAME THEORY