

Outcome Based Education

Name of Programme: Master of Computer Application (MCA)

Program Outcomes (PO's)

1. Nurture knowledgeable and skilled human resources, employable in Information and Communication Technology (ICT) and Information Technology Enable Services (ITES).
2. Ability to apply knowledge of Mathematical Foundations in computing problems.
3. Impart knowledge required for planning, designing and building complex Application.
4. Produce entrepreneurs who can develop customized software solutions for small to large Enterprises.
5. Ability to apply modern IT tools and computational knowledge for developing solutions
6. Ability to function as an effective communicator and team member through essential Skills in multidisciplinary projects.

Program Specific Outcomes (PSO's)

1. Understand the concepts and applications in the field of Computing Sciences like Web designing and development, Mobile application development, and Network and communication technologies.
2. Apply the learning from the courses and develop applications for real world problems.
3. Understand the technological developments in the usage of modern design and development tools to analyze and design for a variety of applications.
4. Communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare.

Course Outcomes (CO's)

**M. C. A. Science (Part I) (Level-6.0) (Semester I) (NEP-2020)
(Introduced from Academic Year 2023-24)**

Title of Course: Advanced Data Structures

Course Code: MMT-101

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Analyze the asymptotic performance of algorithms.
2. Compare algorithms based on time & space complexity.
3. To learn how data structure concepts are useful in problem solving..
4. To implement different ways of data structures such as stacks, linked lists and trees
5. Understand different algorithm design approaches.

Title of Course: Database Management System

Course Code: MMT-102

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Learn and practice data modeling using the entity-relationship and developing database designs.
2. Understand the use of Structured Query Language (SQL) and learn SQL syntax.
3. Apply normalization techniques to normalize the database
4. Understand the needs of database processing and learn techniques for controlling the consequences of concurrent data access.

Title of Course: Practical-I

Course Code: MMPR-103

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. To become familiar with programming environment.
2. To implement linear data structures.
3. Able to create tables and generate queries
4. Apply data structures in real life problems.

Title of Course: Cyber Security

Course Code: MMT-104

Total Credits: 02

Course Outcomes: Upon successful completion of this course, the student will be able to:

- 1) Realize the need for Cyber Security
- 2) Understand the vulnerabilities in the Network and Computer System
- 3) Understand social media forensics.

Title of Course: Computer Networks

Course Code: MET-105

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Analyze the basics of data communications and network architecture.
2. Analyze functions of each layer of a computer network.
3. Evaluate essential features of specific protocols in the common protocol suite.
4. Analyze the methodology and the rationale behind addressing, routing, and congestion control.
5. Understand various multiplexing and switching methods used in networks.
6. Compare and contrast symmetric and asymmetric encryption systems and their vulnerability to attack, and explain the characteristics of hybrid systems.

7. Identify some of the factors driving the need for network security

Title of Course: Computer Architecture

Course Code: MET-106

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Understand the basic components and organization of a computer system.
2. Gain knowledge of the fundamental principles of computer architecture.
3. Learn the different instruction set architectures (ISAs) and their impact on system performance.
4. Understand memory systems, including cache organization and virtual memory.
5. Study input/output (I/O) devices and their interaction with the system.
6. Learn about the role and design of system buses and interconnects.

Title of Course: Research Methodology

Course Code: RM-107

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Understand the fundamental concepts and principles of research methodology in computer science
2. Identify and select appropriate research methodologies based on the research problem
3. Formulate research questions and hypotheses in the context of computer science research
4. Design and execute research studies using quantitative and qualitative approaches
5. Apply ethical considerations in conducting computer science research
6. Develop critical thinking and problem-solving skills required for computer science research

M. C. A. Science (Part I) (Level-6.0) (Semester II) (NEP-2020)
(Introduced from Academic Year 2023-24)

Title of Course: Advanced Operating System

Course Code: MMT-201

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. To study the characteristics of OS for Multiprocessor and Multicomputer
2. To learn the issues related to designing OS
3. To learn the latest trends in building Mobile OS
4. The aim of this module is to study, learn, and understand the main concepts of advanced operating systems

Title of Course: Java Programming

Course Code: MMT-202

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. To become familiar with the features of Java Language.
2. To become comfortable with concepts such as Classes, Objects, Inheritance, Polymorphism and Interfaces.
3. Develop Java client/server applications.
4. Understand distributed applications using RMI
5. Understand Spring and Spring Boot Framework.

Title of Course: Practical-II

Course Code: MMPR-203

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. To understand and implement Java programming environment.
2. Develop Java client/server applications.
3. Develop ASP.NET application
4. Utilize SQL Server with ASP.NET

Title of Course: Web Technology

Course Code: MMT-204

Total Credits: 02

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Understand the basics of web design
2. Develop ASP.NET application
3. Utilize SQL Server with ASP.NET

Title of Course: Network Security

Course Code: MET-205

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Understand the fundamental principles of access control models and techniques, authentication and secure system design.
2. Understand the basics of cryptography and encryption systems.
3. Understand principles and practice of different encryption techniques.
4. Identify and mitigate different network security systems

Title of Course: Software Engineering

Course Code: MET-206

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Students will get foundation of software engineering, various process models and can apply the new models in development process.
2. Students will have effective communication and interaction skills for requirement engineering tasks.
3. Students can apply design principles for various types of software and designing object oriented software using UML tools.
4. Students can implement testing strategies thoroughly using testing tools.
5. Students will understand the need of lifelong learning and adapt to new software engineering concepts.

Title of Course: Internship

Course Code: OJT-207

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. gain industrial experience
2. learn office ethics
3. learn to work in team

**M. C. A. Science (Part II) (Level-6.5) (Semester III) (NEP-2020)
(Introduced from Academic Year 2024-25)**

Title of Course: Artificial Intelligence

Course Code: MMT-301

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Apply problem solving by intelligent search approach.
2. Represent knowledge using knowledge representation techniques.
3. Understand working of Artificial Neural Networks.
4. Derive solutions for problems with uncertainty using Fuzzy theory.
5. To develop a good understanding of Natural Language Processing and Genetic algorithm

Title of Course: Front End Development

Course Code: MMT-302

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. understand the basics of web design
2. gain proficiency in HTML and CSS
3. understand the importance CSS
4. utilize the JavaScript with websites

Title of Course: Practical-III

Course Code: MMPR-303

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. gain proficiency in HTML and CSS
2. understand the importance CSS
3. Understand the construction of PHP scripts for development of dynamic web content
4. Understand the PHP connection with MYSQL

Title of Course: PHP

Course Code: MMT-304

Total Credits: 02

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Understand the basic concept of PHP language.
2. Understand the Object-oriented PHP.
3. Understand the construction of PHP scripts for development of dynamic web content
4. Understand the PHP connection with MYSQL

Title of Course: Cloud Computing

Course Code: MET-305

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Deal with the fundamentals and essentials of Cloud Computing
2. Understand the basic ideas and principles in data centre design; cloud management techniques and cloud software deployment considerations
3. Understand the impact of emerging technologies on cloud computing
4. Understand cloud storage technologies and relevant distributed file systems
5. Expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research
6. Anticipate and adapt to future developments in the cloud computing industry

Title of Course: Data Science

Course Code: MET-306

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Gain an in-depth understanding of Data Science processes, data wrangling, data exploration, data visualization, hypothesis building, and testing
2. Install the required Python environment and other auxiliary tools and Libraries
3. Gain an in-depth understanding of supervised learning
- 4 Use the matplotlib library of Python for data visualization.
- 5 Get introduced to emerging data science techniques

Title of Course: Research Project

Course Code:RP-307

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. find current research domains in computer science
2. identify different research journals in computer science domains
3. understand citations, impact factors, references etc.
4. identification of appropriate societal issues.
5. development of applications to address identified societal issue.

Title of Course: Mobile Application Development

Course Code: MMT-401

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Learn about the features and installation of Android and kotlin
2. Learn about basic programming with Android Kotlin
3. Develop mobile applications using database Connections
4. Develop simple mobile applications in Flutter using Dart language
5. Create a full-fledged mobile app and deploy

Title of Course: Back End Development

Course Code: MMT-402

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Students will be able to develop application using MVC
2. Students will be able to understand Entity Framework
3. Students will be able to understand Web API

Title of Course: Practical-IV

Course Code: MMPR-403

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Learn about basic programming with Android Kotlin
2. Develop mobile applications using database Connections
3. Develop simple mobile applications in Flutter using Dart language
4. Create a full-fledged mobile app and deploy
5. Students will be able to develop application using MVC
6. Students will be able to understand Entity Framework
7. Students will be able to understand Web API

Title of Course: Block Chain Technology

Course Code: MET-404

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. Understand the concept of Blockchain Technology, transactions, block, PoW, Consensus
2. Understand the simulation of blockchain technology without any central controlling or trusted agency and how bitcoin cryptocurrency work.
3. Understand the concept of digital currency, how it can be protected against fraud, scam, hacking and devaluation.
4. Understand the concept of bitcoin and Ethereum.

Title of Course: Machine Learning

Course Code: MET-405

Total Credits: 04

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. To understand fundamental concepts of machine learning and its various algorithms
2. To understand various strategies of generating models from data and evaluating them
3. To apply ML algorithms on given data and interpret the results obtained
4. To design appropriate ML solution to solve real world problems in AI domain

Title of Course: Research Project

Course Code: RP-406

Total Credits: 06

Course Outcomes: Title of Course: Research Project

Course Code: RP-406

Total Credits: 06

Course Outcomes: Upon successful completion of this course, the student will be able to:

1. investigate and design a model for research problem identified.
2. implementation of model with appropriate software tools.

3. benchmark the experimental results.
4. writing a research article.
5. identification of appropriate societal issues.
6. development of applications to address identified societal issue.