Programme Outcomes (POs) of MCA

Savitribai Phule Pune University

2020 Pattern Syllabus

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.

PO2: Identify, formulate, research literature, and solve complex Computing problems reaching substantiated conclusions using fundamental principles of Mathematics, Computing sciences, and relevant domain disciplines.

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.

PO4: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO5: Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.

PO6: Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.

PO7: Recognize the need, and have the ability, to engage in independent learning for continual development as a Computing professional.

PO8: Demonstrate knowledge and understanding of 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.

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.

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 practice.

PO11: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.

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.

Yashaswi Education Society's INTERNATIONAL INSTITUTE OF MANAGEMENT SCIENCE S.No 169/1/A, Opp. Elpro International, Chinchwad, Pune-411033 IIMS

Dr. Shivaji Mundhe
Director- IIMS

Programme Educational Objectives (PEO's) of MCA

Savitribai Phule Pune University

2020 Pattern Syllabus

The basic objective of the Master of Computer Applications (MCA) is to provide a steady stream of necessary knowledge, skills and foundation for acquiring a wide range of rewarding careers into rapidly expanding world of Information Technology

Programme Educational Objectives: PEOs are defined by institution. Following are the guidelines for defining PEOs.

- PEOs should be assessable and realistic within the context of the committed resources.
- The PEOs should be consistent with the mission of the institution.
- All the stakeholders should participate in the process of framing PEOs.
- The number of PEOs should be manageable.
- It should be based on the needs of the stakeholders.
- It should be achievable by the programme.
- It should be specific to the programme and not too broad.
- It should not be too narrow and similar to the PO's.

Yashaswi Education Society's INTERNATIONAL INSTITUTE OF MANAGEMENT SCIENCE S.No.169/1/A, Opp. Elpro International, Chinchwad, Pune-411033. •IIMS•

Dr. Shivaji Mandhe
Director- IIMS

Course Outcomes (CO's) of MCA

2020 Pattern Syllabus

MCA Semester I

Course Code: IT-11 Course Name: Java Programming

CO1 Understand Basic Concepts of OOPs, Java, Inheritance, and Package. (Understand)

CO2: Understand Exception handling, arrays and Strings and multi-threading in Java (Understand.)

CO3: Understand collection framework (Understand)

CO4: Develop GUI using Abstract Windows Toolkit (AWT) and event handling (Apply)

CO5: Develop Web application using JSP and Servlet, JDBC (Apply)

Course Code: IT-12 Course Name: Data Structure and Algorithms

CO1: demonstrate linear data structures linked list, stack and queue (apply)

CO2: implement tree, graph, hash table and heap data structures (apply)

CO3: apply brute force and backtracking techniques (apply)

CO4: demonstrate greedy and divide-conquer approaches (apply)

CO5: implement dynamic programming technique (apply)

Course Code: IT-13 Course Name: Object Oriented Software Engineering

CO1: Distinguish different process model for a software development. (Understand)

CO2: Design software requirements specification solution for a given problem definitions of a software system. (Analyze)

CO3: Apply software engineering analysis/design knowledge to suggest solutions for simulated problems (Analyze)

CO4: Design user interface layout for different types of applications (Apply)

CO5: Recognize and describe current trends in software engineering (Understand)

Course Code: IT-14 Course Name: Operating Systems Concepts

CO1: Understand structure of OS, process management and synchronization. (Understand)

CO2: Understand multicore and multiprocessing OS. (Understand)

CO3: explain Realtime and embedded OS (Understand)

Yashaswi Education Society's INTERNATIONAL INSTITUTE OF MANAGEMENT SCIENCE S.No.169/1/A, Opp. Elpro International, Chinchwad, Pune-411033

Dr. Shivaji D. Mundhe
Director- IIMS

CO4: understand Windows and Linux OS fundamentals and administration. (Understand)

CO5: solve shell scripting problems (Apply)

Course Code: IT-15 Course Name: Network Technologies

CO1: Understand the basic concepts of Computer Network, and principle of layering (Understand)

CO2: Apply the error detection and correction techniques used in data transmission (Apply)

CO3: Apply IP addressing schemes and sub netting (Apply)

CO4: Understand the concept of routing protocols, Application layer protocols and Network Security (Understand)

CO5: Apply the socket programming basics to create a simple chat application (Apply)

Course Code: IT-11L Course Name: Practical

CO1: Demonstrate Collection framework (Apply)

CO2: Develop GUI using awt and swing (Apply)

CO3: Develop Web application using JSP and Servlet, JDBC (Apply)

CO4: Apply Data Structure to solve problems using JavaScript (Apply)

Course Code: ITC11 Course Name: Mini Project

CO1: Create working project using tools and techniques learnt in this semester (Create)

MCA Semester II

Course Code: IT-21 Course Name: Python Programming

CO1: Understand Demonstrate the concepts of python and modular programming. (Understand)

CO2: Apply the concepts of concurrency control in python (Apply)

CO3: Solve the real-life problems using object-oriented concepts and python libraries (Apply)

CO4: Demonstrate the concept of IO, Exception Handling, database (Apply)

CO5: Analyze the given dataset and apply the data analysis concepts and data visualization. (Analyze)

Yashaswi Education Society's INTERNATIONAL INSTITUTE OF MANAGEMENT SCIENCE S.No 169/1A, Opp. Elpro International, Chinchwad, Pune-411033. IIMS

Dr. Shivaji D. Mundhe
Director- IIMS

Course Code: IT-22 Course Name: Software Project Management

CO1: Understand the process of Software Project Management Framework and Apply estimation techniques. (Apply)

CO2: Learn the philosophy, principles and lifecycle of an agile project. (Understand)

CO3: Demonstrate Agile Teams and Tools and Apply agile project constraints and trade-offs for estimating project size and schedule (Apply)

CO4: Explain Project Tracking and Interpretation of Progress Report (Understand)

CO5: Analyze Problem statement and evaluate User Stories (Analyze)

Course Code: MT-21 Course Name: Optimization Techniques

CO1: Understand the role and principles of optimization techniques in business world (Understand)

CO2: Demonstrate specific optimization technique for effective decision making (Apply)

CO3: Apply the optimization techniques in business environments (Apply)

CO4: Illustrate and infer for the business scenario (Analyze)

CO5: Analyze the optimization techniques in strategic planning for optimal gain. (Analyze)

Course Code: IT-23 Course Name: Advanced Internet Technologies

CO1: Outline the basic concepts of Advance Internet Technologies (Understand)

CO2: Design appropriate user interfaces and implements webpage based on given problem Statement (Apply)

CO3: Implement concepts and methods of NodeJS (Apply)

CO4: Implement concepts and methods of Angular (Apply)

CO5: Build Dynamic web pages using server-side PHP programming with Database Connectivity (Apply)

Course Code: IT-24 Course Name: Advanced DBMS

CO1: Describe the core concepts of DBMS and various databases used in real applications (Understand)

CO2: Design relational database using E-R model and normalization (Apply)

CO3: Demonstrate XML database and nonprocedural structural query languages for data access (Apply)

CO4: Explain concepts of Parallel, Distributed and Object-Oriented Databases and their applications (Understand)

Yashaswi Education Society's INTERNATIONAL INSTITUTE OF MANAGEMENT SCIENCE S.No.169/1/A, Opp. Elpro International, Chinchwad, Pune-411033

Dr. Shivaji D. Mundhe
Director- IIMS

CO5: Apply transaction management, recovery management, backup and security – privacy concepts for database applications (Apply)

Course Code: IT-21L Course Name: Practicals

CO1: implement python programming concepts for solving real life problems. (Apply)

CO2: Implement Advanced Internet Technologies (Apply)

Course Code: ITC21 Course Name: Mini Project

CO1: Create working project using tools and techniques learnt in this semester (Create)

MCA Semester III

Course Code: IT-31 Course Name: Mobile Application Development

CO1: Understand Various Mobile Application Architectures. (Understand)

CO2: Apply different types of widgets and Layouts. (Apply)

CO3: Describe Web Services and Web Views in mobile applications. (Understand)

CO4: Implement data storing and retrieval methods in android. (Apply)

CO5: Demonstrate Hybrid Mobile App Framework. (Apply)

Course Code: IT-32 Course Name: Data Warehousing and Data Mining

CO1: Understand Data warehouse concepts, architecture and models (Understand)

CO2: Learn and understand techniques of pre-processing on various kinds of data (Understand)

CO3: Apply association Mining and Classification Techniques on Data Sets (Apply)

CO4: Apply Clustering Techniques and Web Mining on Data Sets (Apply)

CO5: Understand other approaches of Data mining (Understand)

Course Code: IT-33 Course Name: Software Testing and Quality Assurance

CO1: Understand the role of software quality assurance in contributing to the efficient delivery of software solutions. (Understand)

CO2: Demonstrate specific software tests with well-defined objectives and targets. (Apply)

CO3: Apply the software testing techniques in commercial environments. (Apply)

CO4: Construct test strategies and plans for software testing. (Analyze)

Yashaswi Education Society's INTERNATIONAL INSTITUTE OF MANAGEMENT SCIENCE S.No.169/1/A, Opp. Elpro International, Chinchwad, Pune-411033 •IIMS•

Dr. Shivaji D. Mundhe
Director- IIMS

CO5: Demonstrate the usage of software testing tools for test effectiveness, efficiency and coverage (Apply)

Course Code: IT-34 Course Name: Knowledge Representation and Artificial Intelligence: ML, DL

CO1: Understand basic building block of Artificial Intelligence and Knowledge Representation. (Understand)

CO2: Apply Propositional Logic for knowledge representation. (Apply)

CO3: Design various models based on Machine Learning methodology (Apply)

CO4: Design various models based on Deep Learning methodology (Apply)

CO5: Understand various hardware and software aspect used for AI and its application. (Understand)

Course Code: IT-35 Course Name: Cloud Computing

CO1: Describe the concepts of Cloud Computing and its Service Models& Deployment Models. (Understand)

CO2: Classify the types of Virtualizations. (Understand)

CO3: Describe the Cloud Management and relate Cloud to SOA. (Understand)

CO4: Interpret Architecture and Pharrell Programming of Cloud Computing. (Apply)

CO5: Demonstrate practical implementation of Cloud computing. (Apply)

Course Code: IT-31L Course Name: Practicals

CO1: Develop mobile application. (Apply)

CO2: Develop ML, DL models using Python (Apply)

Course Code: ITC31 Course Name: Mini Project

CO1: Create working project using tools and techniques learnt in this semester (Create)

MCA Semester IV

Course Code: IT-41 Course Name: DevOps

CO1: describe the evolution of technology & timeline (Understand)

CO2: explain Introduction to various Devops platforms (Remember)

CO3: demonstrate the building components / blocks of Devops and gain an insight of the Devops Architecture. (Understand)

Dr. Shivaji D. Mundhe
Director- IIMS

CO4: apply the knowledge gain about Devops approach across various domains (Apply)

CO5: build DevOps application (Apply)

Course Code: BM-41 Course Name: PPM and OB

CO1: Describe and analyze the interactions between multiple aspects of management. (Understand)

CO2: Analyze the role of planning and decision making in Organization (Analyze)

CO3: Justify the role of leadership qualities, Motivation and Team Building. (Analyze)

CO4: Analyze stress management and conflict management (Analyze)

CO 5: Describe Personality and Individual Behaviour (Understand)

Course Code: ITC41 Course Name: Project

CO1: Create working project using tools and techniques learnt in the programme (Create)

Yashaswi Education Society's INTERNATIONAL INSTITUTE OF MANAGEMENT SCIENCE S.No.169/1/A, Opp. Elpro International, Chinchwad, Pune-411033 IIMS

Dr. Shivaji D. Mundhe
Director- IIMS

Savitribai Phule Pune University, Pune

Faculty of Commerce and Management

Master of Computer Applications (MCA)

Programme Curriculum (Sem. I & II)
(2020-2022)

Preamble:

1. The name of the programme shall be Masters of Computer Applications (M.C.A)
2. The revised MCA Curriculum 2020 builds on the implementation of the Choice Based Credit System (CBCS) and Grading System initiated in the AY 2015. The curriculum takes the MCA programme to the next level in terms of implementing Outcome Based Education along with the Choice Based Credit System (CBCS) and Grading System.
3. The Institutes should organize placement programme for M.C.A. students by interacting with Industries and software consultancy.
4. At the end of each semester, appearing for various certifications is possible for each student enabling them to make their resume rich.
5. With the rapidly changing scenario industry and academia should identify possible areas of collaboration and work together. Institute's placement cell should focus on identifying industrial expectations and institutional preparation for meeting industrial needs.

Introduction:

1. Definition: Outcome Based Education:

1.1 Outcome Based Education (OBE) Approach: Outcomes are about performance, and this implies:

- **1.1.1** There must be a performer – the student (learner), not only the teacher
- **1.1.2** There must be something performable (thus demonstrable or assessable) to perform
- **1.1.3** The focus is on the performance, not the activity or task to be performed

1.2 Programme Educational Objectives (PEOs): Programme educational objectives are broad statements that describe the career and professional accomplishments that the programme is preparing graduates to achieve. Programme Educational Objectives are a set of broad future focused learner's performance outcomes that explicitly identify what learners will be able to do with what they have learned, and what they will be like after they leave institution and are living full and productive lives. Thus, PEOs are what the programme is preparing graduates for in their career and professional life (to attain within a few years after graduation).

1.3 Programme Outcomes (POs): Programme Outcomes are a set of narrow statements that describes what students (learners) of the programme are expected to know and be able to perform or attain by the time of graduation.

1.4 Course Outcomes (COs): Course Outcomes are narrower statements that describe what students are expected to know and be able to do at the end of each course. These relate to the skills, knowledge, and behavior that students acquire in their matriculation through the course.

1.5 Learning Outcomes: A learning outcome is what a student CAN DO because of a learning experience. It describes a specific task that he/she can perform at a given level of competence under a certain situation. The three broad types of learning outcomes are: a) Disciplinary knowledge and skills b) Generic skills c) Attitudes and values

1.6 Teaching and Learning Activities (TLAs): The set of pedagogical tools and techniques or the teaching and learning activities that aim to help students to attain the intended learning outcomes and engage them in these learning activities through the teaching process.

1.7 Assessment and Evaluation: Assessment is one or more processes, carried out by the institution, that identify, collect, and prepare data to evaluate the achievement of programme educational objectives and programme outcomes. Evaluation is one or more processes, done by the evaluation team, for interpreting the data and evidence accumulated through assessment practices. Evaluation

1.8 determines the extent to which programme educational objectives or programme outcomes are being achieved, and results in decisions and actions to improve the programme.

2. MCA Programme Focus:

The basic objective of the Master of Computer Applications (MCA) is to provide a steady stream of necessary knowledge, skills and foundation for acquiring a wide range of rewarding careers into rapidly expanding world of Information Technology

2.1 Programme Educational Objectives: PEOs are defined by institution. Following are the guidelines for defining PEOs

- **2.1.1** PEOs should be assessable and realistic within the context of the committed resources.
- **2.1.2** The PEOs should be consistent with the mission of the institution.
- **2.1.3** All the stakeholders should participate in the process of framing PEOs.
- **2.1.4** The number of PEOs should be manageable.
- **2.1.5** It should be based on the needs of the stakeholders.
- **2.1.6** It should be achievable by the programme.
- **2.1.7** It should be specific to the programme and not too broad.
- **2.1.8** It should not be too narrow and similar to the POs.

2.2 MCA Programme Outcomes (POs): At the end of the MCA programme the learner will possess the following Program Outcome:

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.

PO2: Identify, formulate, research literature, and solve *complex* Computing problems reaching substantiated conclusions using fundamental principles of Mathematics, Computing sciences, and relevant domain disciplines.

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.

PO4: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO5: Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.

PO6: Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.

PO7: Recognize the need, and have the ability, to engage in independent learning for continual development as a Computing professional.

PO8: Demonstrate knowledge and understanding of 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.

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.

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 practice.

PO11: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.

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.

3. Admission Details:

3.1 Eligibility for Admission: The eligibility criteria for admission for the MCA course will be as decided by the All Indian Council of Technical Education (AICTE), New Delhi and Directorate of Technical Education (DTE), Government of Maharashtra. It will be published on their respective websites time to time.

3.2 Reservation of Seat: The percentage of seat reserved for candidates belonging to backward classes only from Maharashtra State in all the Government Aided, Un-aided Institutions/Colleges and University Departments is as per the norms given by Government of Maharashtra, time to time.