MCA Bridge Course (Qualifying Papers)		
S.No	Course Code	Course Outcome
1.	MBCT 101	1. Understand basic concepts and terminology of information technology. 2. Have a basic understanding of personal computers and their operations. 3. Be able to identify issues related to information security.
2	MBCT 102	1. The student will learn to formulate simple algorithms for arithmetic and logical problems. 2. To analyze and understand the fundamentals of C programming 3. Demonstrate the concept of pointers and function 4. To analysis the concepts of structures and unions, bit wise operators, files, command line arguments.
3	MBCT 103	1. Select & use of web templates as per user requirement. 2. Basic web designing. 3. Client side validations & enhancements via client-side scripting. 4. Ability to understand the difference between client & server technologies.
MCA : I Semester		
4	MCAT 101	1. For a given logic sentence express it in terms of predicates, quantifiers, and logical connectives 2. For a given a problem, derive the solution using deductive logic and prove the solution based on logical inference 3. For a given a mathematical problem, classify its algebraic structure 4. Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra 5. Develop the given problem as graph networks and solve with techniques of graph theory
5	MCAT 102 & MCAP 102	1. For a given query write relational algebra expressions for that query and optimize the developed expressions 2. For a given specification of the requirement design the databases using ER method and normalization. 3. For a given specification construct the SQL queries for Open source and Commercial DBMS -MYSQL, ORACLE, and DB2. 4. For a given query optimize its execution using Query optimization algorithms 5. For a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability. 6. Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling
6	MCAT 103 & MCAP 103	1. Understanding fundamental of operating systems and system programming. 2. Apply the process management concept and threads in OS 3. Analyze the performance of various device and resource management techniques for different systems. 4. Examine process synchronization and deadlock problem related to inconsistency and race conditions with shared variables.

		5. Analyze the working of IO management and disk scheduling. 6. Analyze and report appropriate OS design choices when building real world systems.
7	MCAT 104 & MCAP 104	1. Interpret the functional architecture of computing systems. 2. Identify, compare and assess issues related to ISA, memory, control and I/O functions. 3. Design and analyze solutions in the area of computer architecture.
8	MCAT 105 & MCAP 105	1. Develop knowledge, skills and judgment around technical communication and facilitate their ability to work collaboratively with others. 2. Recommended technique of effective listening and speaking. 3. Understand the proper usage off grammar in one's career development as a lifelong learning. 4. Justification of a variety of accurate sentence structure. 5. Express the capacity to use various writing form, to achieve the specific purpose of the course.
9	MCAP 106	1. To Understand the basic programming structure of Python 2. Using Python Libraries 3. Access database using python programming. 4. Implementing database using SQLite. 5. Create applications using python programming. 6. Write clear and effective python code. 7. Able to apply the principles python programming.
MCA : II Semester		
10	MCAT 201	1. To prepare the student to solve algebraic and transcendental equation by the numerical method. 2. To prepare the student to use interpolation techniques for a given tabulation data 3. To prepare the students to use numerical techniques to solve ordinary differential equation and integration 4. To prepare the student to curve fit data using several types of curves. 5. To prepare the student to Time series and forecasting methods, Statistical Quality Controls methods
	MCAT 202 MCAP 202	1. Select appropriate data structures as applied to specified problem definition. 2. Students will be able to implement linear and Non-Linear data structures. 3. Determine and analyse the complexity of given Algorithms. 4. Ability to choose appropriate algorithm design techniques for solving problems. 5. Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs
11	MCAT 203 MCAP 203	1. Prepare the basics of Internet, Internet Services and E-Mail Concepts. 2. Evaluate the object oriented programming concepts using java as well as the purpose and usage principles of inheritance,

		polymorphism, encapsulation and method overloading 3. able to apply object oriented programming features and concepts for solving given problem 4. Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, automatic documentation through comments, error exception handling) 5. Able to develop interactive programs using applets and swings
12	MCAT 204 MCAP 204	1. Outline basics to advanced concepts and techniques of Computer networks. 2. Describe problem solving approaches as applied in Data communication networking areas. 3. Analyse performance of basic communication networks using both analytical and simulation techniques. 4. Develop the Computer network design techniques and practical implementation issues. 5. Understand the basic properties of internet and data traffic properties. 6. Apply verification and validation techniques on a given software project. 7. Demonstrate deployment and basic maintenance skills.
	MCAT 205	1. Assess and solve basic binary math operations using the microprocessor and explain the microprocessor's internal architecture and its operation within the area of manufacturing and performance. 2. Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor. 3. Compare accepted standards and guidelines to select appropriate Microprocessor (8085 & 8086) to meet specified performance requirements. 4. Analyze assembly language programs; select appropriate assemble into machine a cross assembler utility of a microprocessor. 5. Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to external devices. 6. Evaluate assembly language programs and download the machine code that will provide solutions real-world control problems
	MCAT 206	1. Understand the Accounting principles and skill to solve Accounting problems. 2. Understand about the Financial Management and business techniques to raise funds. 3. Gain knowledge in Cost Accounting and fixing MRP for their product. 4. Handle the organization problems and sources and applications of funds. 5. Understand the importance of computerized Accounting in modern world.
MCA : III Semester		
	MCAT 301	1 .Understand the mathematical representation and derivation of

		formal languages. 2. Classify machines by their power to recognize languages. 3. Illustrate finite state machines to solve problems in computing and relationship between Finite State Machine and Regular Expression. 4. Familiarize Regular grammars, context frees grammar which is crucial to understand how compiler and programming languages are built. 5. Understand the concepts of PDA and the relationship between PDA and Context Free Language and CFG
	MCAT 302 MCAP 302	1. Implement Software life cycle models and have a knowledge of different phases of Software life cycle 2. Identify, formulate, review, estimate and schedule complex software projects using principles of mathematics. 3. Create a bug free software with good design and quality by using appropriate techniques and modern engineering and IT tools. 4. Analyze verification, validation activities, static, dynamic testing, debugging tools and techniques and importance of working in teams.
	MCAT 303 MCAP 303	1. Apply knowledge of statistics, science and programming skills, to solve of complex analytical problems related to big data and business analytics. 2. Identify, formulate, and analyze business analytical problems concerning and demanding big data. 3. Design and evaluate fully distributed model of big data to solve real time problems. 4. Make use of research-based knowledge to identify the appropriate data collection methods, apply statistical methods to analyze, synthesis and interpretation of data, to provide valid conclusions. 5. Function in multi-disciplinary teams through groups while working on mini-project concerning business analytical problems.
	MCAT 304	1. Acquire advanced Data Analysis skills. 2. Stay Industry relevant and grow in your career. 3. Create AI/ML solutions for various business problems. Ÿ Build and deploy production grade AI/ML applications. 4. Apply AI/ML methods, techniques and tools immediately
	MCAT 305	1. To apply the basic mathematical techniques to solve combinatorial problems. 2. To apply the basic concepts of recurrence relation. 3. To apply the basic concepts of graph theory to model real world problems. 4. Evaluate cut-sets and apply the concepts of matrix. 5. To apply the concepts of graph coloring 6. To apply the basic mathematical techniques to solve combinatorial problems.
	MCAT 306	1. Understand the significance of value inputs in a classroom and start applying them in their life and profession 2. Distinguish between values and skills, happiness and

		accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc. 3. Understand the role of a human being in ensuring harmony in society and nature. 4. Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work
MCA : IV Semester		
	MCAT 401 MCAP 401	1. Students will understand .NET Framework and describe some of the major enhancements to the new version of Visual Basic. 2. Students will describe the basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE). 3. Students will create applications using Microsoft Windows Forms. s4. Students will create applications that use ADO. NET
	MCAT 402 & MCAP 402	1. Provide security of the data over the network. 2. Do research in the emerging areas of cryptography and network security. 3. Implement various networking protocols. 4. Protect any network from the threats in the world
	MCAT 411	1. Appreciate the advantages and limitations of fuzzy systems and their potential impacts and applications in intelligent control and automation; 2. Appreciate the advantages and limitations of neural networks and their potential impacts and applications in intelligent automation; and 3. Develop an understanding of generic algorithms and their potential applications.
	MCAT 412	1. use public and private cloud solutions for computational science and engineering applications 2. discuss key concepts of cloud computing services, such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS); 3. asses the suitability of cloud computing infrastructures for different scientific applications; 4. implement software for cloud-based distributed computing using the technology presented in the course; 5. Critically analyze and present solutions and implementations in writing and orally.
	MCAT 413	1. Students will develop relevant programming abilities. 2. Students will demonstrate proficiency with statistical analysis of data. 3. Students will develop the ability to build and assess data-based models. 4. Students will execute statistical analyses with professional statistical software. 5. Students will demonstrate skill in data management. 6. Students will apply data science concepts and methods to solve problems in real-world contexts and will communicate these

		solutions effectively
	MCAT 414	1. List various approaches of Machine Learning. 2. Describe machine learning algorithms to solve the real world problems 3. Develop Hypothesis and machine learning models 4. Identify appropriate models for solving machine learning problems. 5. Apply learning techniques to solve real world machine learning problems. 6. Evaluate and interpret the results of the algorithms.
	MCAT 415	1. Differentiate the different methods of random number generation. 2. Analyze how simulation is useful in research. 3. Able to create the simulation model the system for different fields. 4. Analyze the role of probability and different probability distribution in simulation. 5. Analyze how queuing system is useful in simulation.
	MCAT 421	1. Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing 2. Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc. 3. Explain the core issues of cloud computing such as security, privacy, and interoperability. 4. Choose the appropriate technologies, algorithms, and approaches for the related issues. 5. Identify problems, and explain, analyze, and evaluate various cloud computing solutions. 6. Provide the appropriate cloud computing solutions and recommendations according to the applications used. 7. Attempt to generate new ideas and innovations in cloud computing.
	MCAT 422	1. Have a good understanding of the mathematical foundations for digital manipulation of images. 2. Be able to write programs for digital manipulation of images. 3. Learn and understand the Image Enhancement in the Spatial Domain. 4. Be able to use different digital image processing algorithms. 5. Be able to design, code and test digital image processing applications. 6. Analyze a wide range of problems and provide solutions related to the design of image processing systems through suitable algorithms, structures, diagrams, and other appropriate methods.
	MCAT 423	1 .Understand the use of the components of a graphics system and became familiar with building approach of graphics system components and algorithms related with them. 2. Understand the basic principles of 3- dimensional computer graphics and understand how to scan convert the basic geometrical primitives, how to transform the shapes to fit them as

		per the picture definition. 3. Understand the mapping from a world coordinates to device coordinates, clipping, and projections. 4. Able to discuss the application of computer graphics concepts in the development of computer games, information visualization, and business applications. 5. Comprehend and analyze the fundamentals of multimedia, underlying technologies, principles, and applications.
	MCAT 424	1. Analyze different approaches to software quality assurance 2. Apply software quality assurance knowledge in practice 3. Evaluate software metrics results 4. Analyze different approaches to software testing and quality assurance, and select optimal solutions for different situations and projects; 5. Evaluate the work of peers constructively by following proven methods of peer review, and by using the principles of ethics
	MCAT 425	1. Understands compiler and various phases in compilation. 2. Understands Lexical Analysis and implement it using LEX tool. 3. Understands LL, LR, and SLR parsing techniques. 4. Implement parsing using YACC tool. 5. Understands Syntax Directed Translation, Symbol Tables and their applications. 6. Understands Intermediate Code Generation and Code Optimization
	MCAT 431	1. To understand the abstract simulation of real nervous system 2. To learn the origin and ideological basics of artificial neural networks 3. To understand different structure of ANN 4. To learn and understand various basic methods of learning 5. Perceptron and dynamical theories of recurrent networks including amplifiers, attractors, and hybrid computation would be studied.
	MCAT 432	1. Interpret the impact and challenges posed by IoT networks leading to new architectural models. 2. Compare and contrast the deployment of smart objects and the technologies to connect them to network. 3. Appraise the role of IoT protocols for efficient network communication. 4. Elaborate the need for Data Analytics and Security in IoT. 5. Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry
	MCAT 433	1. Applications and implementation strategies 2. State-of-the-art, open research challenges, and future directions 3. Working with digital crypto currencies
	MCAT 434	1. Describe the typical NLP problems, their importance & difficulty; and concepts of morphology, syntax, semantics, discourse & pragmatics of natural language. 2. Demonstrate understanding of the relationship between NLP and statistics & machine learning.

		3. Discover various linguistic and statistical features relevant to the basic NLP task, namely, spelling correction, morphological analysis, parts-of-speech tagging, parsing and semantic analysis. 4. Develop systems for various NLP problems with moderate complexity. 5. Evaluate a NLP system, identify shortcomings and suggest solutions for these shortcomings.
	MCAT 435	1. Learn the Internet Programming, using Java Applets. 2. Create a full set of UI widgets and other components, including windows, menus, buttons. 3. Apply event handling on AWT and Swing components. 4. Learn to access database through Java programs, using Java Data Base Connectivity (JDBC) 5. Create dynamic web pages, using Servlets and JSP.