University of Engineering and Management

INSTITUTE OF ENGINEERING & MANAGEMENT, NEWTOWN

DEPARTMENT OF COMPUTER APPLICATIONS

DETAILED SYLLABUS BOOKLET –

4TH SEMESTER – MCA – 2024-2026 BATCH

Syllabus Structure
2nd Year 2nd Semester (4th Semester)

Course Code	Course Title	Total No. of Contact Hours				Total No. of Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
4th Semester (Theory)						
MCA401 A/B/C/D	Elective - I	3	1	0	4	3
MCA402 A/B/C	Elective - II	3	1	0	4	3
MCA403	Values and Ethics	2	0	0	2	1
MCA405	Management & Accounting	2	0	0	2	2
MCA(GS)401	General Studies & Current Affairs - IV	2	0	0	2	0.5
Total of Theory					14	9.5
4th Semester (Practical)						
MCA491	Major Project	0	0	10	10	15
Total of Practical					10	15
4th Semester (Sessional)						
MCA(GS)481	Competitive Aptitude Training - IV	2	0	0	2	0.5
IFC	Industry and Foreign Certification	0	0	0	0	0
MAR	Mandatory Additional Requirements	0	0	0	0	0
MOOCS	Massive Open Online Courses	0	0	0	0	0
Total of Sessional					2	2.5
Total of Semester					31	27

Elective No.	Course Code	Topic	Elective No.	Course Code	Topic
I	MCA401A	Distributed Database Management	II	MCA402A	Compiler Design
	MCA401B	Image Processing		MCA402B	Mobile Computing
	MCA401C	Parallel Programming		MCA402C	Embedded Systems
	MCA401D	Cloud Computing		MCA402D	Natural Language Processing

University of Engineering and Management

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University of Engineering & Management, Jaipur

4th Semester Syllabus for MCA Admission Batch 2024

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Syllabus for MCA Admission Batch 2024, 4th Semester

Subject Name: Distributed Database Management **Credit: 03**

Subject Code: MCA401A **Lecture Hours: 40 Hrs.**

Name of the Course: Distributed Database Management	
Course Code: MCA401A	**Semester:**
Duration: 40 hours	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Credit: 3	
Aim:	
Sl. No.	
1	Develop a deep understanding of distributed database architecture and design principles.
2	Equip students with skills for optimizing distributed query processing and managing transactions.
3	Enable application of data warehousing, OLAP, and data mining techniques for real-world problem-solving.
Objective:	
Sl. No.	
1	Understand the architecture and design of distributed database systems.

2	Apply techniques for distributed query processing and optimization.
3	Master the concepts of distributed transaction processing and data warehousing.
4	Utilize data mining methods such as association analysis, classification, and clustering.
Pre-Requisite:	
Sl. No.	
1.	Fundamentals of Database Management Systems, Basic Knowledge of Computer Networks, Programming Skills & Operating systems
Course Outcome:	
1.	Understand and explain the architecture and design principles of distributed database systems.
2.	Apply methods and techniques for distributed query processing and optimization.
3.	Understand the concepts of distributed transaction processing, data warehousing, and OLAP technology.
4.	Apply methods and techniques for data association analysis, classification, and clustering.
Relevant Links:	
DDBMS Study Material	DDBMS NPTEL LINK DDBMS Coursera Link DDBMS LinkedIn Learning Link

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	1	1	1	0	0	0	2	3	1	1
CO2	2	2	1	1	2	1	0	1	0	0	0	1	2	1	1
CO3	3	2	2	2	3	1	1	1	0	0	0	2	3	2	1
CO4	3	3	2	2	2	1	1	2	1	1	1	2	3	1	2

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	**Introduction to Distributed Database Management System**	Distributed DBMS features and needs. Reference architecture. Levels of distribution transparency, and replication. Distributed database design – fragmentation, allocation criteria. Storage mechanisms. Translation of global queries. / Global query optimization. Query execution and access plan. Concurrency control – 2 phases locks. Distributed deadlocks. Time-based and quorum-based protocols. Comparison. Reliability- non-blocking commitment protocols.	https://online.stanford.edu/courses/cs244b-distributed-systems	12
2	**Partitioned Networks**	Partitioned networks. Checkpoints and cold starts. Management of distributed transactions- 2-phase unit protocols. Architectural aspects. Node and link failure recoveries.	https://online.stanford.edu/courses/cs244b-distributed-systems	8
3	**Distributed Database Administration**	Distributed data dictionary management. Distributed database administration. Heterogeneous databases-federated database, reference architecture, loosely and tightly coupled. Alternative architecture. Development tasks, Operation- global task management. Client-server databases- SQL server, open database connectivity. Constructing an application.	https://online.stanford.edu/courses/cs244b-distributed-systems	10

List of Books Text Books:			
Name of Author	**Title of the Book with Book Chapter**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Stefano Ceri & Giuseppe Pelagatti	Distributed Databases: Principles and Systems	**978-0070265110**	McGraw Hill Education

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Subject Name: Image Processing **Credit: 03**

Subject Code: MCA401B **Lecture Hours: 32 Hrs.**

Name of the Course: Image Processing	
Course Code: MCA401B	**Semester:**
Duration: 32 hours	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Credit: 3	
Aim:	
Sl. No.	
1	Equip students with a solid understanding of the core principles and techniques used in image processing.
2	Enable students to apply image processing methods to analyze, enhance, and manipulate digital images for various applications.
3	Prepare students to solve complex real-world problems related to image analysis, computer vision, and pattern recognition.

Objective:	
Sl. No.	
1	Understand the fundamental principles and techniques of image processing.
2	Apply methods to enhance and manipulate digital images.
3	Develop skills in image analysis and computer vision.
4	Solve real-world problems using image processing techniques.
Pre-Requisite:	
Sl. No.	
1.	Fundamentals of Database Management Systems, Basic Knowledge of Computer Networks, Programming Skills & Operating systems
Course Outcome:	
1.	To study the image fundamentals and mathematical transforms necessary for image processing.
2.	To study the image enhancement techniques
3.	To study image restoration procedures
4.	To study the image compression procedures
Relevant Links:	
Image Study Material	Image NPTEL LINK Image Coursera Link Image LinkedIn Learning Link

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	1	1	1	0	0	0	2	3	1	1
CO2	2	2	1	1	2	1	0	1	0	0	0	1	2	1	1
CO3	3	2	2	2	3	1	1	1	0	0	0	2	3	2	1
CO4	3	3	2	2	2	1	1	2	1	1	1	2	3	1	2

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	**Introduction and Digital Image Fundamentals** **Image enhancement in the Spatial domain**	Digital Image Fundamentals, Human visual system, Image as a 2D data, Image representation – Grayscale and Colour images, image sampling and quantization Basic grey level Transformations, Histogram Processing Techniques, Spatial Filtering, Low pass filtering, High pass filtering	https://stanford.edu/class/ee368/	6
2	**Filtering in the Frequency Domain** **Image Restoration and Reconstruction**	Preliminary Concepts, Extension to functions of two variables, Image Smoothing, Image Sharpening, Homomorphic filtering. Noise Models, Noise Reduction, Inverse Filtering, MMSE (Wiener) Filtering	https://stanford.edu/class/ee368/	6
3	**Colour Image Processing** **Image Compression**	Colour Fundamentals, Color Models, Pseudo colour image processing Fundamentals of redundancies, Basic Compression Methods: Huffman coding, Arithmetic coding, LZW coding, JPEG Compression standard	https://stanford.edu/class/ee368/	6
4	**Morphological Image Processing**	Erosion, dilation, opening, closing, Basic Morphological Algorithms: hole filling, connected components, thinning, , skeletons	https://stanford.edu/class/ee368/	6
5	**Image Segmentation** **Object Recognition and Case Studies Object Recognition**	point, line and edge detection, Thresholding, Regions Based segmentation, Edge linking and boundary detection, Hough transform patterns and pattern classes, recognition based on decision-theoretic methods, structural methods, case studies – image analysis Application of Image processing in process industries	https://stanford.edu/class/ee368/	8

List of Books Text Books:			
Name of Author	**Title of the Book with Book Chapter**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Chandra& Majumder	Digital Image Processing &Analysis	2nd Edition	PHI
Anil K. Jain	Fundamentals of Digital Image Processing	1st Edition	Pearson

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Syllabus for MCA Admission Batch 2024, 4th Semester

Subject Name: Parallel Programming **Credit: 03**

Subject Code: MCA401C **Lecture Hours: 36 Hrs.**

Name of the Course: Parallel Programming	
Course Code: MCA401C	**Semester:**
Duration: 40 hours	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Credit: 3	

Aim:	
Sl. No.	
1	Equip students to write efficient parallel programs for faster computation.
2	Prepare students for industry applications in high-performance and big-data computing.
3	Foster critical thinking and innovation in solving computational challenges with parallel techniques.

Objective:	
Sl. No.	
1	Understand the fundamentals of parallel computing architectures and models.
2	Develop skills to design, implement, and debug parallel algorithms.
3	Gain proficiency in using parallel programming languages and tools.
4	Analyze the performance and scalability of parallel applications.
Pre-Requisite:	
Sl. No.	
1.	Basic knowledge of programming, data structures, and algorithms.
Course Outcome:	
1.	Understand the evolution of High-Performance Computing (HPC) with respect to lawsand the contemporary notion that involves mobility for data, hardware devices and software agents
2.	Understand, appreciate and apply parallel and distributed algorithms in Problem Solving.
3.	Evaluate the impact of network topology on parallel/distributed algorithm formulationsand traffic their performance.
4.	Gain hands-on experience with agent-based and Internet-based parallel and distributed programming techniques.
Relevant Links:	
PP Study Material	PP NPTEL LINK PP Coursera Link PP LinkedIn Learning Link

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	2	3	2	1	1	0	1	1	2	3	1	2
CO2	3	3	3	3	3	2	1	0	2	1	2	3	3	3	3
CO3	3	3	2	2	3	2	2	1	0	1	1	2	2	2	3
CO4	3	3	3	3	3	1	1	0	2	1	2	3	3	3	3

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	**Fundamentals of Parallel Programming**	Processes and processors. Shared memory. Fork. Join constructs. Basic parallel programming techniques- loop splitting, spin locks, contention barriers and row conditions. Variations in splitting, self and indirect scheduling.	https://web.stanford.edu/class/cs315b/	12
2	**Data Dependency and Scheduling Techniques**	Data dependency-forward and backward block scheduling. Linear recurrence relations. Backward dependency.	https://web.stanford.edu/class/cs315b/	12
3	**Advanced Performance Tuning and Parallel Programming Techniques**	Performance tuning overhead with a number of processes, effective use of cache. Parallel programming examples: Average, mean squared deviation, curve fitting, numerical integration, travelling salesman problem, Gaussian elimination. Discrete event time simulation. Parallel Programming Constructs in HPF, FORTRAN 95. Parallel programming under Unix.	https://web.stanford.edu/class/cs315b/	12

List of Books Text Books:			
Name of Author	**Title of the Book with Book Chapter**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Quinn	Parallel Computing	2nd Edition	TMH

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Subject Name: Cloud Computing **Credit: 03**

Subject Code: MCA401D **Lecture Hours: 40 Hrs.**

Name of the Course: Cloud Computing	
Course Code: MCA401D	**Semester:**
Duration: 40 hours	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Credit: 3	
Aim:	
Sl. No.	
1	Analyze the Evolution and Impact of Cloud Computing
2	Evaluate Cloud Computing Service Models and Deployment Strategies
3	Investigate Security Challenges and Solutions in Cloud Computing
Objective:	
Sl. No.	
1	To understand the fundamental concepts of cloud computing.

2	To explore different cloud service models and cloud deployment models.
3	To gain practical knowledge on cloud storage, virtualization, and cloud security.
4	To comprehend the economic, organizational, and technological aspects of cloud computing and development of applications leveraging cloud-based services and APIs.
Pre-Requisite:	
Sl. No.	
1.	Basic understanding of computer networks, operating systems, and internet technologies.
Course Outcome:	
1.	Understand and explain the key concepts and principles of cloud computing, including its architecture, components, and models.
2.	Differentiate between various cloud service models (IaaS, PaaS, SaaS) and deployment models (public, private, hybrid, community), and assess their suitability for different scenarios.
3.	Apply virtualization techniques and cloud storage solutions to design and manage scalable and efficient cloud-based systems.
4.	Analyse cloud security mechanisms and issues, and implement strategies to safeguard data and applications in the cloud environment.
Relevant Links:	
Cloud Study Material	Cloud NPTEL LINK Cloud Coursera Link Cloud LinkedIn Learning Link

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	1	1	1	0	0	0	2	3	1	1
CO2	2	2	1	1	2	1	0	1	0	0	0	1	2	1	1
CO3	3	2	2	2	3	1	1	1	0	0	0	2	3	2	1
CO4	3	3	2	2	2	1	1	2	1	1	1	2	3	1	2

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	Introduction to Cloud Computing and Cloud Service Models	Definition and Essential Characteristics of Cloud Computing, History and Evolution of Cloud Computing, Benefits and Challenges of Cloud Computing, Cloud Computing Architecture, Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), Function as a Service (FaaS)	MIT's "Cloud Computing" course, Stanford University's "CS240A: Cloud Computing and Big Data" course University of California Berkeley's "Cloud Computing Concepts" course	6
2	Cloud Deployment Models	Public Cloud, Private Cloud, Hybrid Cloud, Community Cloud	Industry: IBM Cloud, AWS, Google Cloud Platform Academia: University of Illinois Urbana-Champaign's "CS498: Cloud Computing" course, Carnegie Mellon University's "Cloud Infrastructure" course	6
3	Virtualization	Concepts of Virtualization, Types of Virtualization (Server, Network, Storage), Virtual Machines (VMs), Containers and Docker	Industry: VMware, Docker, Kubernetes Academia: Stanford University's "CS240: Advanced Topics in Operating Systems" course, University of Washington's "CSE 599: Virtualization Technologies" course	6
4	Cloud Storage	Storage as a Service (STaaS), Cloud Storage Architectures, Storage Types: Block, File, and Object Storage, Examples: Amazon S3, Google Cloud Storage	Industry: Amazon S3, Google Cloud Storage, Microsoft Azure Blob Storage Academia: University of California Berkeley's "CS162: Operating Systems and Systems Programming" course, Princeton University's "COS 518: Advanced Operating Systems" course	6

5	Cloud Security and Cloud Networking	Security Issues in Cloud Computing, Identity and Access Management (IAM), Data Protection and Encryption, Regulatory and Compliance Issues, Networking Basics for Cloud, Software-Defined Networking (SDN), Network Function Virtualization (NFV), Cloud Load Balancing	Industry: AWS Security, Google Cloud Security, Microsoft Azure Security, Cisco, AWS VPC, Google Cloud VPC Academia: Georgia Tech's "CS 6262: Network Security" course, University of Maryland's "ENPM693: Cloud Security" course Stanford University's "CS244: Advanced Topics in Networking" course, MIT's "6.829: Computer Networks" course	8
6	Cloud Application Development and Future Trends	Developing Cloud-Native Applications, Microservices Architecture, DevOps and CI/CD Pipelines, Example Platforms: AWS Lambda, Google Cloud Functions Edge Computing, Serverless Computing, Quantum Cloud Computing, AI and Machine Learning in the Cloud	Industry: AWS Lambda, Google Cloud Functions, Microsoft Azure DevOps, IBM Quantum Experience, AWS DeepRacer, Google AI Academia: UC Berkeley's "CS169: Software Engineering" course, University of Michigan's "EECS 485: Web Systems" course MIT's "6.S191: Introduction to Deep Learning" course, Stanford's "CS221: Artificial Intelligence" course	8

List of Books Text Books:			
Name of Author	**Title of the Book with Book Chapter**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Rajkumar Buyya, Christian Vecchiola, Sb Thamarai Selvi	Chapter 1: Introduction Mastering Cloud Computing	1st / 978-1259029950	Mc Graw Hill
Rajkumar Buyya, Christian Vecchiola, Sb Thamarai Selvi	Chapter 3: Virtualization Mastering Cloud Computing	1st / 978-1259029950	Mc Graw Hill
Rajkumar Buyya, Christian Vecchiola, Sb Thamarai Selvi	Chapter 4: Cloud Computing Architecture Mastering Cloud Computing	1st / 978-1259029950	Mc Graw Hill
Rajkumar Buyya, Christian Vecchiola, Sb Thamarai Selvi	Chapter 9: Cloud Platforms in Industry Mastering Cloud Computing	1st / 978-1259029950	Mc Graw Hill
Rajkumar Buyya, Christian Vecchiola, Sb Thamarai Selvi	Chapter 10: Cloud Applications Mastering Cloud Computing	1st / 978-1259029950	Mc Graw Hill
Rajkumar Buyya, Christian Vecchiola, Sb Thamarai Selvi	Chapter 5: Virtual Machines Provisioning and Migration Services Mastering Cloud Computing	1st / 978-1259029950	Mc Graw Hill
Arshdeep Bahga, Vijay Madisetti	Chapter 12: Cloud Security Cloud Computing A Hands-On Approach	1st / 9788173719233	University Press
Reference Books:			
Thomas Erl, Zaigham Mahmood, Ricardo Puttini	Cloud Computing: Concepts, Technology & Architecture	1st / 978-0133387520	Prentice Hall
Michael J. Kavis	Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, and IaaS)	1st / 978-1118617618	Wiley
Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi	Mastering Cloud Computing: Foundations and Applications Programming	1st / 978-0124114548	Morgan Kaufmann

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Syllabus for MCA Admission Batch 2024, 4th Semester

Subject Name: Compiler Design **Credit: 03**

Subject Code: MCA402A **Lecture Hours: 40 Hrs.**

Name of the Course: **Compiler Design**	
Course Code :MCA402A	**Semester:4th**
Duration: 40Hrs.	**MaximumMarks:100**
Teaching Scheme	**Examination Scheme**
Theory:3	EndSemesterExam:100
Tutorial: 1	ContinuousAssessment:100
Practical:0	PracticalSessionalinternalcontinuousevaluation:0
Credit:3+0	PracticalSessionalexternalexamination:0
Aim:	
Sl.No.	
1	To gain Knowledge of Various aspects of a Compiler.
2	To enhance Ability to identify qualities of a good solution of NFA, DFA etc.
3	To implement NFA to DFA conversion techniques and different parsing methods to solve problems.

Objective:	
Sl.No.	
1	Provide you with the knowledge and expertise to become a proficient compiler design.
2	Demonstrate an understanding of parsing and polishing expression concepts that are vital for compiler design.
3	To produce DFA from an NFA to understand a basic compiler.
4	Critically evaluate NFA based on their design and create DFA from that.
Pre-Requisite:	
Sl.No.	
1.	Proficiency in data structure, graph theory, automata theory and C programming.
Course Outcome:	
1.	Understand fundamentals of compiler and identify the relationships among different phases of the compiler.
2.	Understand the application of finite state machines, recursive descent, production rules, parsing, and language semantics.
3.	Analyze & implement required module, which may include front-end, back-end, and a small set of middle-end optimizations.
4.	Use modern tools and technologies for designing new compiler.
RelevantLinks:	
Study Material	NPTELLINK Coursera Link LinkedIn Learning Link

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	-	-	-	-	-	-	2	-	-
CO2	2	3	2	2	-	-	-	-	-	-	-	-	2	2	-
CO3	2	3	3	2	-	-	-	-	1	1	2	1	2	3	2
CO4	2	2	2	3	3	-	-	-	1	1	2	2	-	3	3

Module number	Topic	Sub-topics	MappingwithIndustry and International Academia	Lecture Hours	CorrespondingLabAssignment
1	Context Free Grammars	Classification of grammars. Context free grammars. Deterministic finite state automata (DFA) Non-DFA Scanners. Top down parsing, LL grammars. Bottom up parsing.	***International Academia:*** ***AICTE-prescribed syllabus:*** ***IndustryMapping:***The concepts delivered are in sync with the industry standards	15	NA
2	Polishing Expressions	Polishing expressions, Operator precedence grammar, IR grammars, Comparison of parsing methods. Error handling.	***International Academia:*** ***AICTE-prescribed syllabus:*** ***Industry Mapping:*** The concepts delivered are in sync with the industry standards	15	NA
3	Symbol table handling techniques	Symbol table handling techniques. Organization for non-block and block-structured languages. Run time storage administration. Static and dynamic allocation. Intermediate forms of source program. Polish N-tuple and syntax trees. Semantic analysis and code generation. Code optimization, folding, and redundant sub-expression evaluation. Optimization within iterative loops.	***International Academia:*** ***AICTE-prescribed syllabus:*** ***Industry Mapping:*** The concepts delivered are in sync with the industry standards	10	NA

List of Books Text Books:			
Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Aho, Lam, Sethi, Ullman	Compilers – Principles, Techniques & Tools	2nd Edition	Pearson
Holub	Compiler Design in C	2nd Edition	Prentice Hall
Mishra, Chandrasekaran	Theory of Computer Science: Automata, Languages and Computation	3rd Edition	PHI

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Subject Name: Mobile Computing **Credit: 03**

Subject Code: MCA402B **Lecture Hours: 40 Hrs.**

Name of the Course: Mobile Computing	
Course Code: MCA402B	**Semester:**
Duration: 40	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Credit: 3	
Aim:	
Sl. No.	
1	To understand the fundamental concepts and technologies driving mobile computing
2	To understand Mobile Networking and Connectivity
3	To address challenges in mobile security and optimization

Objective:	
Sl. No.	
1	Gain a foundational understanding of mobile communication systems, including cellular networks and their evolution.
2	Grasp the core concepts of mobile networking protocols, covering aspects like network layers and routing in unique mobile environments.
3	Explore the various mobile communication technologies and protocols.
4	Develop critical knowledge of security challenges and solutions for mobile computing devices and applications.
Pre-Requisite:	
Sl. No.	
1.	Knowledge of computer fundamentals and networking concepts.
Course Outcome:	
1.	Define mobile technologies in terms of hardware, software, and communications.
2.	Utilize mobile computing nomenclature to describe and analyze existing mobile computing frameworks and architectures.
3.	Evaluate the effectiveness of different mobile computing frameworks.
4.	Describe how mobile technology functions to enable other computing technologies.
Relevant Links:	
MC Study Material	MC NPTEL LINK MC Coursera Link MC LinkedIn Learning Link

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	2	3	2	1	0	0	0	0	0	3	2	2
CO2	2	3	2	2	3	2	1	0	0	0	0	0	3	3	2
CO3	2	3	2	2	3	2	1	0	0	0	0	0	3	3	2
CO4	2	2	2	2	3	2	1	0	0	0	0	0	3	3	2

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	Introduction: Wireless Transmission: Access Control:	Introduction and Application of Mobile Computing Wireless Transmission: Frequency for radio transmission, Signals, Antennas, Signal propagation, Multiplexing, Modulation, Spread spectrum, Cellular systems, Medium Access Control: Motivation for a specialised MAC: Hidden and Exposed terminals. Near and Far terminals; SOMA, FOMA; TOMA: Fixed TOM, Classical Aloha, Slotted Aloha, Carrier sense multiple access, Demand assigned multiple access, PRMA packet reservation multiple access, PRMA packet reservation multiple access, reservation TOMA, Multiple access with collision avoidance, Polling, Inhibit sense multiple access	***AICTE-prescribed syllabus:*** https://www.aicte-india.org/sites/default/files/bvoc/Mobile%20Communication.pdf ***Industry Mapping:*** The concepts delivered are in sync with the industry standards	4
2	**CDMA:** GSM:	CDMA: Spread Aloha multiple access Telecommunication Systems: GSM: Mobile Services, System Architecture, radio interface, Protocols, Localization and Calling, Handover, Security, New Data Services, DECT, Systems Architecture Protocol Architecture: TETRA I, UMTS and IMT-2000, UMTS Basic Architecture, UTRA FDD mode, UTRA TDD mode	***AICTE-prescribed syllabus:*** https://www.aicte-india.org/sites/default/files/bvoc/Mobile%20Communication.pdf ***Industry Mapping:*** The concepts delivered are in sync with the industry standards	8

3	**Satellite Systems:** Wireless LAN: IEEE 802.11: Bluetooth:	Satellite Systems: History, Applications, Basics: GEO, LEO, MEO, Routing, Localization. Handover Examples: Broadcast Systems: Overview, Cyclic Repetition, Digital Audio; broadcasting: Multimedia object transfer Protocol; Digital Video Broadcasting Wireless LAN: Infrared vs. Radio Transmission, Infrastructure and Ad Hoc networks, IEEE 802.11: System Architecture, Protocol Architecture, Physical Layer, Medium Access Control Layer, MAC management, Future development; HIPERLAN: Protocol architecture, Physical Layer Channel access control. Sub layer, Medium Access control sub layer, Information bases and networking; Bluetooth: User Scenarios, Physical Layer, MAC layer, Networking, Security, Link management. Wireless ATM: Motivation for WATM, Wireless ATM working group, WATM services, Reference model: Example configurations, Generic reference model;	***AICTE-prescribed syllabus:*** https://www.aicte-india.org/sites/default/files/bvoc/Mobile%20Communication.pdf ***Industry Mapping:*** The concepts delivered are in sync with the industry standards	8
4	**Handover:** **Location management:** **Mobile Network Layer:**	Handover: Handover reference model, Handover requirements, Types of handover, Handover scenarios, Backward handover, Forward handover; Location management: Requirements for location management, Procedures and Entities; Addressing, Mobile quality of service, Access point control protocol. Mobile Network Layer: Mobile IP: Goals, assumptions and requirements, Entities and Terminology, IP packet delivery, Agent advertisement and discovery, Registration,	***AICTE-prescribed syllabus:*** ***https://www.aicte-india.org/sites/default/files/bvoc/Mobile%20Communication.pdf*** ***Industry Mapping: The concepts delivered are in sync with the industry standards***	

5		Tunnelling and Encapsulation, Optimizations, Reverse Tunnelling, Ipv6; Dynamic host configuration protocol, Ad hoc networks: Routing, Destination sequence distance vector, Dynamic source routing, Hierarchical algorithms, Alternative metrics. Mobile Transport Layer: Traditional TCP: Congestion control, Slow start, Fast retransmit/fast recovery, Implications on mobility; Indirect TCP, Snooping TCP, mobile RCP, Fast retransmit/fast recovery, Transmission/time-out freezing, Selective retransmission, Transaction oriented TCP. Support for Mobility:	***AICTE-prescribed syllabus:*** ***https://www.aicte-india.org/sites/default/files/bvoc/Mobile%20Communication.pdf*** ***Industry Mapping: The concepts delivered are in sync with the industry standards***	7
6	**File systems:** **Wireless application protocol:**	File systems: Consistency, Examples; World Wide Web: Hypertext transfer protocol, Hypertext markup language, Some approaches that might help wireless access, System architectures; Wireless application protocol: Architecture, Wireless datagram protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment, Wireless markup language; WML script, Wireless telephony application, Examples "Stacks with WAP, Mobile databases, Mobile agents. Security and privacy aspects of Mobile	***AICTE-prescribed syllabus:*** ***https://www.aicte-india.org/sites/default/files/bvoc/Mobile%20Communication.pdf*** ***Industry Mapping: The concepts delivered are in sync with the industry standards***	6

List of Books Text Books:			
Name of Author	**Title of the Book with Book Chapter**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Jochen Schiller	Mobile Communications (Chapters: 1, 2, 3, 4, 5, 7, 8, 9, 10)	2nd Edition	Pearson
Reference Books:			
William Stallings	Wireless Communications and Networks		PHI
Rappaport	Wireless Communications Principals and Practices	2nd Edition	Pearson
Ashoke Talukder	Mobile Computing	2nd Edition	TMH

University of Engineering and Management
Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur
Syllabus for MCA Admission Batch 2024, 4th Semester

Subject Name: Embedded Systems **Credit: 03**

Subject Code: MCA402C **Lecture Hours: 40 Hrs.**

Name of the Course: Embedded Systems	
Course Code: MCA402C	**Semester:**
Duration: 40	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Credit: 3	
Aim:	
Sl. No.	
1	To understand the fundamental concepts and technologies driving mobile computing
2	To understand Mobile Networking and Connectivity
3	To address challenges in mobile security and optimization

Objective:	
Sl. No.	
1	Gain a foundational understanding of mobile communication systems, including cellular networks and their evolution.
2	Grasp the core concepts of mobile networking protocols, covering aspects like network layers and routing in unique mobile environments.
3	Explore the various mobile communication technologies and protocols.
4	Develop critical knowledge of security challenges and solutions for mobile computing devices and applications.
Pre-Requisite:	
Sl. No.	
1.	Knowledge of computer fundamentals and networking concepts.
Course Outcome:	
1.	Understand the concept of embedded systems, microcontroller, different components of microcontroller and their interactions.
2.	Get familiarized with the programming environment to develop embedded solutions.
3.	Program ARM microcontroller to perform various tasks.
4.	Understand the key concepts of embedded systems such as I/O, timers, interrupts and interaction with peripheral devices.
Relevant Links:	
ES Study Material	ES NPTEL LINK ES Coursera Link ES LinkedIn Learning Link

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	1	0	1	1	1	1	2	3	1	2
CO2	2	2	2	1	3	1	0	1	1	1	1	2	3	1	2
CO3	2	2	2	2	3	1	0	1	1	1	1	2	3	1	2
CO4	3	2	2	2	2	1	0	1	1	1	1	2	3	1	2

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	**Introduction to Embedded Systems:** **Embedded Processors:**	Definition of Embedded System, Embedded Systems Vs General Computing Systems, History of Embedded Systems, Classification of Embedded Systems, Relation between Microcontroller and Embedded System, Major Application Areas, Purpose of Embedded Systems, Characteristics and Quality Attributes of Embedded Systems Types of Embedded Processors, Microprocessors, Microcontrollers, DSP, Embedded Processors from Future Electronics, Applications for embedded processors, Choosing the Right Embedded Processor.	***AICTE-prescribed syllabus:*** https://www.aicte-india.org/sites/default/files/bvoc/Mobile%20Communication.pdf ***Industry Mapping:*** The concepts delivered are in sync with the industry standards	4
2	**Embedded Systems**	Application- and Domain-Specific: Washing Machine-Application Specific Example of Embedded System, Automotive- Domain Specific Example of Embedded System. The core of the Embedded System: General Purpose and Domain Specific Processors, ASICs, PLDs, Commercial Off-The-Shelf Components (COTS), Embedded	***AICTE-prescribed syllabus:*** https://www.aicte-india.org/sites/default/files/bvoc/Mobile%20Communication.pdf ***Industry Mapping:*** The concepts	8

		Memories: Scratchpad Memories, Cache Memories, Flash Memories, Memory according to the type of Interface, Memory Shadowing and memory selection for Embedded Systems, Sensors and Actuators. Communication Interface: Onboard and External Communication Interfaces.	delivered are in sync with the industry standards	
3	**Embedded Firmware:** **RTOS-Based Embedded System Design:**	Reset Circuit, Brown-out Protection Circuit, Oscillator Unit, Real Time Clock, Watchdog Timer, Embedded Firmware Design Approaches and Development Languages. Operating System Basics, Types of Operating Systems, Tasks, Process and Threads, Multiprocessing and Multitasking, Task Scheduling.	***AICTE-prescribed syllabus:*** https://www.aicte-india.org/sites/default/files/bvoc/Mobile%20Communication.pdf ***Industry Mapping:*** The concepts delivered are in sync with the industry standards	8
4	**Task Communication:** **Task Synchronization:** **Trends in Embedded Industry:**	Shared Memory, Message Passing, Remote Procedure Call and Sockets Task Communication/Synchronization Issues, Task Synchronization Techniques, Device Drivers, How to Choose an RTOS. Processor Trends in Embedded System, Embedded OS Trends, Development Language Trends	***AICTE-prescribed syllabus:*** ***https://www.aicte-india.org/sites/default/files/bvoc/Mobile%20Communication.pdf*** ***Industry Mapping: The concepts delivered are in sync with the industry standards***	

List of Books Text Books:			
Name of Author	**Title of the Book with Book Chapter**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Shibu K. V	Introduction to Embedded Systems	2nd Edition	Mc Graw Hill
Raj Kamal	Embedded Systems	4th Edition	TMH
Reference Books:			
Frank Vahid	Embedded System Design	1st Edition	John Wiley
Lyla B Das	Embedded Systems	1st Edition	Pearson
David E. Simon	An Embedded Software Primer	1st Edition	Pearson Education

University of Engineering and Management
Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur
Syllabus for MCA Admission Batch 2024, 4th Semester

Subject Name: Natural Language Processing **Credit: 03**

Subject Code: MCA402D **Lecture Hours: 40 Hrs.**

Name of the Course: Embedded Systems	
Course Code: MCA402D	**Semester: 4**
Duration: 40	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Credit: 3	

Aim:	
Sl. No.	
1	To enable computers to understand, interpret, and generate human language to bridge the gap between human communication and machine processing.
2	To allow NLP for the creation of systems that can perform tasks like answering questions, translating languages, summarizing documents, and conversing with users, as well as improving data analysis from text and speech.
3	To create systems that can produce coherent and natural-sounding text or speech from structured data.

Objective:	
Sl. No.	
1	To teach the fundamentals of NLP, and also to make them for understanding CFG, PCFG in NLP.
2	To know the role of semantics of sentences and pragmatic.
3	To teach the basic concepts of speech processing along with analysis and modeling.
Pre-Requisite:	
Sl. No.	
1.	Strong programming skills (especially in Python), a solid foundation in mathematics and statistics (including linear algebra and probability) and knowledge of machine learning concepts.
Course Outcome:	
1.	learn the fundamentals of natural language processing
2.	understand the use of CFG and PCFG in NLP
3.	understand the role of semantics of sentences and pragmatic
4.	Introduce Speech Production and Related Parameters of Speech.
5.	Show the computation and use of techniques such as short time fourier transform, linear predictive coefficients and other coefficients in the analysis of speech.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	2	-	1	1	2	-	1	2	1	1	-	-
CO2	1	3	1	1	-	1	1	2	-	1	1	1	-	2	-
CO3	2	1	2	1	-	1	2	2	-	2	2	1	-	2	-
CO4	1	1	1	1	2	3	1	2	-	1	1	2	-	-	2

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	**Introduction**	Origins and challenges of nlp – language modeling: grammar-based lm, statistical lm – regular expressions, finite-state automata – english morphology, transducers for lexicon and rules, tokenization, detecting and correcting spelling errors, minimum edit distance	https://onlinecourses.nptel.ac.in/noc19_cs56/preview	8
2	**Word Level Analysis**	Unsmoothed n-grams, evaluating n-grams, smoothing, interpolation and backoff – word classes, part-of-speech tagging, rule-based, stochastic and transformation-based tagging, issues in pos tagging – hidden markov and maximum entropy models.	https://onlinecourses.nptel.ac.in/noc19_cs56/preview	4
3	**Syntactic Analysis**	Context free grammars, grammar rules for english, treebanks, normal forms for grammar – dependency grammar – syntactic parsing, ambiguity, dynamic programming parsing – shallow parsing – probabilistic cfg,	https://onlinecourses.nptel.ac.in/noc19_cs56/preview	8

		probabilistic cyk, probabilistic lexicalized cfgs – feature structures, unification of feature structures.		
4	**Semantics And Pragmatics**	Requirements for representation, first-order logic, description logics – syntax-driven semantic analysis, semantic attachments – word senses, relations between senses, thematic roles, selectional restrictions – word sense disambiguation, wsd using supervised, dictionary & thesaurus, bootstrapping methods – word similarity using thesaurus and distributional methods.	https://onlinecourses.nptel.ac.in/noc19_cs56/preview	6
5	**Basic Concepts of Speech Processing**	Speech fundamentals: articulatory phonetics – production and classification of speech sounds; acoustic phonetics – acoustics of speech production; review of digital signal processing concepts; short-time fourier transform, filter-bank and lpc methods.	https://onlinecourses.nptel.ac.in/noc19_cs56/preview	6
6	**Speech-Analysis, Speech Modelling**	Features, feature extraction and pattern comparison techniques: speech distortion measures– mathematical and perceptual – log–spectral distance, cepstral distances, weighted cepstral distances and filtering, likelihood distortions, spectral distortion using a warped frequency scale, lpc, plp and mfcc coefficients, time alignment and normalization – dynamic time warping, multiple time – alignment paths. Hidden markov models: markov processes, hmms – evaluation, optimal state sequence – viterbi search, baum-welch parameter re-estimation, implementation issues.	https://onlinecourses.nptel.ac.in/noc19_cs56/preview	8

List of Books Text Books:			
Name of Author	**Title of the Book with Book Chapter**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Daniel Jurafsky, James H. Martin	Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech		Pearson Publication
Steven Bird, Ewan Klein and Edward Loper	Natural Language Processing with Python		OReilly Media
Lawrence Rabiner And Biing-Hwang Juang	Fundamentals Of Speech Recognition		Pearson Education
Daniel Jurafsky And James H Martin	Speech And Language Processing – An Introduction to Natural Language Processing, Computational Linguistics, And Speech Recognition		Pearson Education
Reference Books:			
Frederick Jelinek	Statistical Methods Of Speech Recognition		MIT Press
Breck Baldwin	Language Processing with Java and LingPipe Cookbook		Atlantic Publisher
Richard M Reese	Natural Language Processing with Java		OReilly Media

University of Engineering and Management
Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur
Syllabus for MCA Admission Batch 2024, 4th Semester

Subject Name: Values and Ethics **Credit: 03**

Subject Code: MCA403 **Lecture Hours: 40 Hrs.**

Name of the Course: Values and Ethics		
Course Code: MCACC403		**Semester: 4th**
Duration: 40 Hrs.		**Maximum Marks: 100**
Teaching Scheme		**Examination Scheme**
Theory: 1		End Semester Exam: 100
Tutorial: 1		Continuous Assessment: 100
Credit: 1		
Aim:		
Sl. No.		
1	To gain knowledge of various aspects general ethics and energy in life.	
2	To get ability to identify relations among technology, engineering and human aspects	
3	To implement values in various aspects of life with morality.	

Objective:	
Sl. No.	
1	An ability to analyze a problem, then identify and formulate the computing requirements appropriate to its solution
2	Development of Solutions- An ability to design, implement and evaluate a Computer based problems with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
3	Conduct investigations of complex problem – An ability to design and conduct experiments, as well as to analyze and interpret data to reach valid conclusions.
Pre-Requisite:	
Sl. No.	
1.	Knowledge in General Studies, Fundamentals of Computers, Proficiency in Communication Skills.
Course Outcome:	
1.	Understanding the importance and role of science, technology and engineering as knowledge and social-professional world, know the technological growth
2.	To realize the importance of energy as resource and crisis in energy, understand the effect of degradation and pollution of environment, introduce eco-friendly technology.
3.	To choose the appropriate technology for development, understand the transfer, assessment and impact of technology, learn the role of human resource in engineering , man-machine interaction, impact of automation, introduce human-centric technology..
4.	To determine the relation between profession and human values like value crisis in society, life, personality and mental health. know the role/importance of values in law, justice in Indian perspective, know the aesthetic values, learning the relation between morality and ethics and virtue ethics.
Relevant Links:	
VE Study Material	VE NPTEL LINK VE Coursera Link VE LinkedIn Learning Link

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1	0											
CO2	1	1	1	2	1										
CO3	1	2	1	1	1										
CO4	3	1	1	1											

Module number	Topic	Subtopics	Mapping withIndustry and International Academia	Lecture Hours
1	**Introduction and Relation with Energy**	. Science, Technology and Engineering as Knowledge and as Social and Professional Activities Effects of Technological Growth Rapid Technological growth and depletion of resources. Reports of the Club of Rome. Limits of growth. Energy Crisis; Renewable Energy Resources Environmental degradation.	***International Academia:*** (https://ocw.mit.edu/courses/211-450-literature-and-ethical-values-fall-2002/pages/syllabus/) ***AICTE-prescribed syllabus:*** (https://www.aicte-india.org/downloads/mcadegree.pdf) ***Industry Mapping: Case Studies, Fieldwork***	12
2	**Human, Technology and Engineering Ethics**	Technologies. Environmental Regulations. Environmental Ethics Appropriate Technology Movement of Schumacher Human Operator in Engineering projects and industries. Problems of man machine interaction. Impact of assembly line and automation. Engineering profession: Ethical issues in engineering practice.	International Standards (https://ocw.mit.edu/courses/211-450-literature-and-ethical-values-fall-2002/pages/syllabus/) AICTE prescribed syllabus: (https://www.aicte-	12

		Conflicts between business demands and professional ideals. Social and ethical Responsibilities of Technologists	india.org/downloads/mcadegree.pdf) Industry Mapping: Case Study based, Field analysis, CSR	
3	**General Values**	Nature of values: Value Spectrum of a 'good' life Psychological values: Integrated personality; mental health	International Standards : (https://ocw.mit.edu/courses/211-450-literature-and-ethical-values-fall-2002/pages/syllabus/) AICTE prescribed syllabus: (https://www.aicte-india.org/downloads/mcadegree.pdf) Industry Mapping: Case studies, GAP analysis, Ethical audit	8
4	**Other Types of Values and Morality**	The modern search for a 'good' society, Moral and ethical values: Nature of moral judgments; canons of ethics; Ethics of virtue; ethics of duty; ethics of responsibility	International Standards: (https://ocw.mit.edu/courses/211-450-literature-and-ethical-values-fall-2002/pages/syllabus/) AICTE prescribed syllabus: (https://www.aicte-india.org/downloads/mcadegree.pdf) Industry Mapping: Case study, organization visits, HR Policies.	8

List of Books Text Books:			
Name of Author	**Title of the Book**	**Edition**	**Name of the Publisher**
S.K. Sarangi	Values & Ethics of Profession & Business(Chapter No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 16)	2nd edn	Asian Books
Reference Books:			
Manna, Chakraborti	Values and Ethics in Business and Profession (Chapter No. 4, 5, 6)	1st edn	PHI
Chattopadhyay, Singh	Ethics & Values for Engineers & Managers (Chapter No. 3, 4)	1st edn	HPH

University of Engineering and Management
Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur
Syllabus for MCA Admission Batch 2024, 4th Semester

Subject Name: Management and Accounting **Credit: 03**

Subject Code: MCA405 **Lecture Hours: 21 Hrs.**

Name of the Course: Management and Accounting	
Course Code: MCA405	**Semester:**
Duration: 21	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 2	End Semester Exam: 100
Tutorial:	Continuous Assessment: 100
Credit: 2	

Aim:	
Sl. No.	
1	To gain Knowledge of basic aspects of Management
2	To enhance Ability to identify qualities of a good Management Control and Strategy
3	To implement learned Concept of Financial and Cost Accounting to solve problems

Objective:	
Sl. No.	
1	The fundamental in basic in Management
2	Basic concepts in the Management control and strategy
3	Principles of Financial Accounting
4	Significance of Cost Accounting in the Accounting field
Pre-Requisite:	
Sl. No.	
1.	Proficiency in Basic of Management and Accounting
Course Outcome:	
1.	On completion of this course students are expected to learn various Concept of Planning, scheduling, organizing, staffing, directing, controlling Managerial economics
2.	On completion of this course students are expected to design Management Control system.
3.	On completion of this course students are expected to do a comparative analysis among different Financial statement and Financial accounting used in a given scenario.
4.	On completion of this course students are expected to acquire adequate knowledge and skills to solve a real-life Cost Volume Profit analysis and budgeting
Relevant Links:	
MA Study Material	MA NPTEL LINK MA Coursera Link MA LinkedIn Learning Link

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-
CO3		-	-	3	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	2	3	-	-	-	-	-	-	-	-	-	-

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	Basics of management	Planning, scheduling, organizing, staffing, directing, controlling Managerial economics and financial management, productivity management Human resource development and management, selection, training and role of IT	***AICTE-prescribed syllabus:*** https://makautexam.net/aicte_details/Syllabus/MCA/sem221.pdf ***Industry Mapping:*** The concepts delivered are in sync with the industry standards	4
2	Management Control Systems	Introduction to management control systems: goals, strategies; Performance measures	***AICTE-prescribed syllabus:*** https://makautexam.net/aicte_details/Syllabus/MCA/sem221.pdf ***Industry Mapping:*** The concepts delivered are in sync with the industry standards	3
3	Strategy	Firm and its environment, strategies and resources, industry structure and analysis, corporate strategies and its evaluation, strategies for growth and diversification, strategic planning	***AICTE-prescribed syllabus:*** https://makautexam.net/aicte_details/Syllabus/MCA/sem221.pdf ***Industry Mapping:*** The concepts delivered are in sync with the industry standards	4
4	Financial Accounting	Financial statements and analysis Conceptual framework of cost accounting. Financial accounting computer packages.	***AICTE-prescribed syllabus:*** ***https://makautexam.net/aicte_details/Syllabus/MCA/sem221.pdf*** ***Industry Mapping: The concepts delivered are in sync with the industry standards***	5
5	Cost Accounting	Cost-volume profit (CVP) relationship, budgeting, cost accumulation system, variable and absorption costing system	***AICTE-prescribed syllabus:*** ***https://makautexam.net/aicte_details/Syllabus/MCA/sem221.pdf*** ***Industry Mapping: The concepts delivered are in sync with the industry standards***	5

List of Books Text Books:			
Name of Author	**Title of the Book with Book Chapter**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Khan & Jain	Management Accounting	8th Edition	Mc Graw Hill
Harold Koontz	Essentials of Management	11th Edition	Mc Graw Hill
Reference Books:			
Ramchandran	Accounting for Management (Management Accounting)	2nd Edition	Scitech Publications

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Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur
Syllabus for MCA Admission Batch 2024, 4th Semester

Subject Name: General Studies & Current Affairs - IV **Credit: 0.5**

Subject Code: MCA(GS)401 **Lecture Hours: 48 Hrs.**

Module number	Topic	Sub-topics	Mapping with International/National/ State Level Exams	Lecture Hours	Corresponding Assignment
1	**GK, Current Affairs and Economics**	**Textbook: IGNOU** **1. Balance of Payment**(BECC-106, Block-3, Unit-8) http://egyankosh.ac.in//handle/123456789/75074 **2. Poverty (BECC-112, Block-3, Unit-9)** http://egyankosh.ac.in//handle/123456789/83224 **3. Unemployment-(related to schemes) (BECC-106, Block-2,**	***International Exams*** ***1.GRE (https://www.ets.org/pdfs/gre/gre-math-review.pdf)*** ***2.GMAT (https://downloads.mba.com/downloads/gmat-handbook.pdf)*** ***National Exams:*** ***1. UPSC Civil Services Exam*** (**https://upsc.gov.in/sites/default/files/Notif-CSP-23-engl- 010223.pdf**), pg 25-26 ***UPSC Combined Defence Services (https://upsc.gov.in/sites/def***	48	1. **Balance of Payments**: Write a case study on the BoP crisis India faced in 1991.. 2. **Poverty and Unemployment-** Compare and contrast two major poverty alleviation schemes in India. Discuss their methodologies, target groups, and effectiveness in addressing poverty. 3. **Different types of Goods** Write an essay on the role of different types of goods in daily life. **4. Fiscal Policy of India.** Research the fiscal policy measures taken by the Indian government during recent economic crises, such

		Unit-6) http://egyankosh.ac.in//handle/123456789/75067 **4. Different types of Goods (BECC-101, Block-6, Unit-16)** http://egyankosh.ac.in//handle/123456789/67496 **5. Fiscal Policy of India.(BECC-109, Block-3, Unit-9)** http://egyankosh.ac.in//handle/123456789/76562 **GK and Current Affairs** – Based on Monthly Magazines provided and recentnews of national and international importance. **Newspaper Reading:** The Economic Times.**Traditional GK and CA**: Capitals of countries, currency of countries, important dates,	***ault/files/Notif-CDS-I- Exam-2023-Engl-211222.pdf), pg 20-21*** ***2. RBI Grade B (https://rbidocs.rbi.org.in/rdocs/Content/PDFs/DADVTGRB09052023FA65E4FB1C2CF473396B4FD7E5F69CDDE.PDF), pg 22-23*** ***3. IBPS Probationary officer(https://www.ibps.in/wp-content/uploads/Detailed-Advt.-CRP-PO-XII.pdf) , Pg 7.*** ***4. Combined Graduate Level conducted by SSC (https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_03042023.pdf) pg. 20-22*** ***5. Intelligence Bureau ACIO (https://www.pw.live/exams/wp-content/uploads/2023/11/IB-ACIO-Recruitment-2023-Notification-Emp-News.pdf)*** ***6. XAT (https://xat.org.in/xat-syllabus/)***		as the 2008 global financial crisis or the COVID-19 pandemic. Analyze their effectiveness and impact on the economy. ** All the assignments are in line with entrance exams for premier B-Schools and GS Paper-I of UPSC CSE.

		Sports football, hockey, recent events & awards etc. Important books & authors, Important Hydropower dams, atomic power plant s, important national parks,Minister & portfolio & constituencies, Population census, Persons in news -most famous,popular recent only, Important dances & festivals of Indian states,International Head Quarters & world organization, Important president & pm elected from various countries, Important about banks like payment banks, small banks& license system, Awards, Sports, Books & author, National & International affairs	***7. GATE (https://gate2024.iisc.ac.in/papers-and-syllabus/)*** ***8. CAT https://iimcat.ac.in/per/g01/pub/756/ASM/WebPortal/1/index.html?756@@1@@1*** ***State Level Exams:*** ***9. Civil Services Executive Exam (WBCS) (https://wbpsc.gov.in/Download?param1=20230225142430_Syllabus.pdf&param2=advertisement, pg 1*** ***10.* Miscellaneous Services Recruitment Examination (*file:///C:/Users/UEMK/Downloads/2707970_2019.pdf*), *pg 1***		

References

1. Indian Economy-Ramesh Singh

University of Engineering and Management
Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur
Syllabus for MCA Admission Batch 2024, 4th Semester

Subject Name: Competitive Aptitude Training - IV **Credit: 0.5**

Subject Code: MCA(GS)481 **Lecture Hours: 48 Hrs.**

Module number	Topic	Sub-topics	Mapping with International/National/ State Level Exams	Lecture Hours	Corresponding Assignment
1	**Quantitative Aptitude**	**Textbook:** Quantitative Aptitude for Competitive Examination **Author:** R.S Agarwal **Publishing House:** S.Chand Permutation & Combination: Numbers, Alphabets, Linear arrangement, Circular arrangement, Repetition, Selection based Probability: Coins, Dices, Drawing of balls, Cards, Numbers, Miscellaneous.	***International Exams*** ***1. GRE (https://www.ets.org/pdfs/gre/gre-math-review.pdf)*** ***2. GMAT (https://downloads.mba.com/downloads/gmat-handbook.pdf)*** ***National Exams:*** ***1. UPSC Civil Services Exam*** (https://upsc.gov.in/sites/default/files/Notif-CSP-23-engl-010223.pdf), pg 25-26 ***2. UPSC Combined Defence Services***	12	1. Permutation & Combination a. How to arrange different numbers in different sequences. b. Questions based on Alphabet arrangements. c. Problems based on linear and circular arrangements. d. Problems based on garlands and Necklaces. e. Problems based on selection of things and persons. 2. Probability a. Problems based on different numbers of coin tossed. b. Problems based on rolling dices.

		Mensuration – Rectangle, Square, Triangle, Rhombus, Parallelogram, Cylinder, Cone, Sphere, Hemisphere Geometry-. Lines, Angles, Triangles, Quadrilateral and circles.	***(https://upsc.gov.in/sites/default/files/Notif-CDS-I-Exam-2023-Engl-211222.pdf), pg 20-21*** ***3. RBI Grade B (https://rbidocs.rbi.org.in/rdocs/Content/PDFs/DADVTGRB09052023EA65E4FB1C2CF473396B4FD7E5F69CDDE.PDF), pg 22-23*** ***4. IBPS Probationary officer(https://www.ibps.in/wp-ontent/uploads/Detailed-Advt.-CRP-PO-XII.pdf) , Pg7.*** ***5. Combined Graduate Level conducted by SSC (https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_03042023.pdf) pg. 20-22*** ***Intelligence Bureau ACIO (https://www.pw.live/exams/wp-ontent/uploads/2023/11/IB-ACIO-Recruitment-2023-Notification-Emp-News.pdf)*** ***7. XAT (https://xat.org.in/xat-syllabus/)*** ***8. GATE***		c. Problems based on forming of committees based on selection. 3. Problems based on drawing of cardsMensuration. a. Problems based on 2D and 3D shapes. b. Finding area based on mixed shapes. c. Finding the volume based on different shapes. d. Problems based on Prism Pyramid. 4. Geometry: a. Problems based on Lines and Angles. b. Problems based on complementary, supplementary, corresponding, alternative angles. c. Problems based on acute, right, obtuse, scalene, equilateral, isosceles triangles. d. Basis problems based on Quadrilaterals. e. Basic Problems based on chords and tangents. d. ** All the assignments are in line of GSPaper I of UPSC CSE Mains Examination

			(https://gate2024.iisc.ac.in/papers-and-syllabus/) ***CAT*** ***https://iimcat.ac.in/per/g01/pub/756/ASM/WebPortal/1/index.html?756@@1@@1*** ***State Level Exams:*** ***1. Civil Services Executive Exam (WBCS)*** ***(https://wbpsc.gov.in/Download?param1=20230225142430_Syllabus.pdf&param2=advertisement, pg 1*** ***2.* Miscellaneous Services Recruitment Examination** ***(file:///C:/Users/UEMK/Downl'.oads/2707970_2019.pdf), pg 1***		
2	**Logical Reasoning**	**Textbook: Verbal and Non Verbal reasoning** **Author: R.S Agarwal** **Publishing House: S.Chand** **1) Calendar** **2) Analogy & Classification** **3) Dice & Cube, Puzzles and Sitting Arrangement**	***National Exams:*** ***1. UPSC Civil Services Exam (https://upsc.gov.in/sites/default/files/Notif-CSP-23-engl-010223.pdf), pg 25-26*** ***2. UPSC Combined Defence Services (https://upsc.gov.in/sites/default/files/Notif-CDS-I-Exam-2023-Engl-211222.pdf , pg 20-21)***	12	**1.** Calendar a. Problems based basic structure of a calendar and a concept of an odd day. b. Problems based on leap year in centuries. c. Problems based on exact day and comparison of day. d. Finding the day when another day is given or not given.

			3. Combined Graduate Level conducted by SSC (https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_03042023.pdf) pg. 20-22 ***4. Intelligence Bureau ACIO (https://www.pw.live/exams/wp-content/uploads/2023/11/IB- ACIO-Recruitment-2023-Notification-Emp-News.pdf*** ***State Level Exams:*** ***1.Civil Services Executive Exam (WBCS)*** ***(https://wbpsc.gov.in/Download?param1=20230225142430_Syllabus.pdf&param2=advertisement, pg 1*** ***2. Miscellaneous Services Recruitment Examination (file:///C:/Users/UEM***		**2.** Analogy & Classification a. Problems based on letter or word based analogy. b. Problems based on Number based analogy. c. Problems based on Mixed analogy. d. Problems based on image analogy. **3.** Dice & Cube a. Problems based on standard dice and ordinary dice. b. Problems based on single dice. c. Problems based on two or more dices.

			K/Downloads/2707970_2019.pdf), *pg 1*		
3	**Verbal English- 2**	**Textbook: Objective General English** **Author: R.S Agarwal** **Publishing house: S.Chand** **1) Application of Adverbs** **2) Active Passive Voice** **3) Direct and Indirect Speech** **4) Reading Comprehension** **5) Email Blogs**	***International Exams*** ***1. GRE (https://www.ets.org/gre/test-takers/general-test/prepare/content/verbal-reasoning.html#accordion-9f58105fc6-item-88093eca37)*** ***National Exams:*** ***1. UPSC Civil Services Exam (https://upsc.gov.in/sites/default/files/Notif-CSP-23-engl-010223.pdf), pg 25-26*** ***2. UPSC Combined Defence Services (https://upsc.gov.in/sites/default/files/Notif-CDS-I-Exam-2023-Engl-211222.pdf), pg 20-21*** ***3. Combined Graduate Level conducted by SSC (https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_03042023.pdf) pg. 20-22*** ***4. Intelligence Bureau ACIO***	12	**1.** Application of Adverbs Practice set based on Spotting the Error. **2.** Active Passive Voice Practice set based on conversion of active sentences to passive and vice-versa **3.** Direct and Indirect Speech Practice set based on conversion of direct speech to indirect speech and vice-versa **4.** Reading Comprehension Reading unseen passages and answering questions based on the same **5.** Technical Report Writing Need to submit assignment with one report written on each type of technical report namely White paper,

			(https://www.pw.live/exams/wp-content/uploads/2023/11/IB- ACIO-Recruitment-2023-Notification-Emp-News.pdf) ***State Level Exams:*** ***1. Civil Services Executive Exam (WBCS)*** ***(https://wbpsc.gov.in/Download?param1=20230225142430_Syllabus.pdf&param2=advertisement, pg 1*** ***2. Miscellaneous Services Recruitment Examination (file:///C:/Users/UEMK/Downloads/2707970_2019.pdf) pg1***		Case Studies, Technical Proposals, SDK Documentation