

VIVEKANAND COLLEGE, KOLHAPUR (EMPOWERED AUTONOMOUS)

STATEMENT OF SYLLABUS COVERED

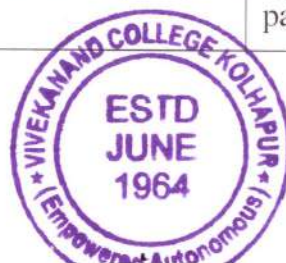
Year- 2025-26

Term- I

Name of teacher- Mr. Vijay Bapuso Pujari

Department- MCA

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to Covered	Remark
M.C.A-I Sem-I	Data Structures Using C++	Unit-I Introduction and meaning of data structure, Linked list-concept of singly, doubly and circular linked list, operations on linked list -Adding and removing nodes, Array implementation of lists, Limitation of the Array.	Unit-I Introduction and meaning of data structure, Linked list-concept of singly, doubly and circular linked list, operations on linked list -Adding and removing nodes, Array implementation of lists, Limitation of the Array.	.....	
		Unit-II STACKS -Definition and Example of stack, Implementation Of Stacks As An Array And Linked List, Operations on stacks, stack stored as a linked list arithmetic expression, converting an expression from Infix To Postfix. QUEUES - Definition And Examples Of Queues, Queues As An Abstract Data Type, Queues Stored As A Linked List, Circular Queue, Implementation Of Queues As An Array And Linked List, Operations On Queues, Priority Queue & Dequeue..	Unit-II STACKS -Definition and Example of stack, Implementation Of Stacks As An Array And Linked List, Operations on stacks, stack stored as a linked list arithmetic expression, converting an expression from Infix To Postfix. QUEUES - Definition And Examples Of Queues, Queues As An Abstract Data Type, Queues Stored As A Linked List, Circular Queue, Implementation Of Queues As An Array And Linked List, Operations On Queues, Priority Queue & Dequeue..	.....	
		Unit- III Trees, General tree, Binary tree, binary search tree, operations on binary search tree, AVL Trees, Single rotation, Double rotation, Red-Black Trees, B-Trees: Definition of B-trees, Basic operations on B-trees, deleting a key from a B-tree. Graphs: Representations of graph, Traversing Graphs, Breadth-first search, Depth-First Search, topological sort, Minimum Spanning trees, Single source shortest path, All pairs shortest path.	Unit- III Trees, General tree, Binary tree, binary search tree, operations on binary search tree, AVL Trees, Single rotation, Double rotation, Red-Black Trees, B-Trees: Definition of B-trees, Basic operations on B-trees, deleting a key from a B-tree. Graphs: Representations of graph, Traversing Graphs, Breadth-first search, Depth-First Search, topological sort, Minimum Spanning trees, Single source shortest path, All pairs shortest path.	.....	



		Unit- IV Recursive Definition and Process, Factorial Function, Multiplication of Natural Numbers, Fibonacci Sequence, Properties of Recursive Definitions, Writing Recursive Programs (The Tower of Hanoi Problem, Converting Prefix to Postfix Using Recursion), Simulating Recursion (Return from A Function, Implementing Recursive Function, Simulation of Factorial)	Unit- IV Recursive Definition and Process, Factorial Function, Multiplication of Natural Numbers, Fibonacci Sequence, Properties of Recursive Definitions, Writing Recursive Programs (The Tower of Hanoi Problem, Converting Prefix to Postfix Using Recursion), Simulating Recursion (Return from A Function, Implementing Recursive Function, Simulation of Factorial)	.....	
M.C.A-I Sem-III	Blockchain	Unit1 :Introduction to Blockchain:Evolution: From Web1.0 to Web3.0 What is blockchain? The need for blockchain Centralized vs Decentralized vs Distributed Systems Blockchain Architecture: Blocks, Headers, Timestamps, Nonce, Hash Structure of a blockchain transaction Chain validation and consensus Roles: Miners, Full nodes, Light nodes Cryptography in Blockchain: Hash Functions: SHA-256, RIPEMD Digital Signature (ECDSA) Public and Private Key Cryptography Merkle Trees and Proof of Inclusion	Unit1 :Introduction to Blockchain:Evolution: From Web1.0 to Web3.0 What is blockchain? The need for blockchain Centralized vs Decentralized vs Distributed Systems Blockchain Architecture: Blocks, Headers, Timestamps, Nonce, Hash Structure of a blockchain transaction Chain validation and consensus Roles: Miners, Full nodes, Light nodes Cryptography in Blockchain: Hash Functions: SHA-256, RIPEMD Digital Signature (ECDSA) Public and Private Key Cryptography Merkle Trees and Proof of Inclusion	.....	
		Unit2: Consensus Mechanisms:Proof of Work (PoW), Proof of Stake (PoS), Delegated PoS Proof of Authority, Proof of History (Solana), BFT models Energy efficiency and alternatives Types of Blockchain: Public, Private, Consortium, Hybrid Permissioned vs Permissionless Networks Blockchain Trilemma: Security, Scalability, Decentralization	Unit2: Consensus Mechanisms:Proof of Work (PoW), Proof of Stake (PoS), Delegated PoS Proof of Authority, Proof of History (Solana), BFT models Energy efficiency and alternatives Types of Blockchain: Public, Private, Consortium, Hybrid Permissioned vs Permissionless Networks Blockchain Trilemma: Security, Scalability, Decentralization	.....	


(Signature of the Teacher)




(Signature of the Head of Department)

Name of teacher- Mr. Mehul Arun Jadhav

Department- MCA

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to Covered	Remark
M.C.A I Sem-I	Advanced Operating System	Unit-I System Structure, User Perspective, Operating System Services Assumption about Hardware, the Kernel and Buffer Cache Architecture of UNIX Operating System, System Concepts, Buffer Headers, Structure of the Buffer Pool, Scenarios for Retrieval of the Buffer, Reading and Writing Disk Blocks, Advantages and Disadvantages of Buffer Cache, Operating system services and systems calls, system programs, operating system structure, operating systems generations.	Unit-I System Structure, User Perspective, Operating System Services Assumption about Hardware, the Kernel and Buffer Cache Architecture of UNIX Operating System, System Concepts, Buffer Headers, Structure of the Buffer Pool, Scenarios for Retrieval of the Buffer, Reading and Writing Disk Blocks, Advantages and Disadvantages of Buffer Cache, Operating system services and systems calls, system programs, operating system structure, operating systems generations.	.....	
		Unit-II Concept of a file, access methods, directory structure, file system mounting, file sharing, protection. File system implementation: file system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, comparison of UNIX and windows.	Unit-II Concept of a file, access methods, directory structure, file system mounting, file sharing, protection. File system implementation: file system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, comparison of UNIX and windows.	.....	
		Unit- III Process States and Transitions Layout of System Memory, The Context of a Process, Manipulation of the Process Address Space, Sleep Process Creation/Termination, The User ID of a Process, Changing the Size of a Process. CONCURRENCY AND SYNCHRONIZATION: Process synchronization, critical section problem, Peterson's solution, synchronization hardware, semaphores, classic problems of synchronization, readers and writers problem, dining philosophers problem, monitors, synchronization examples(Solaris), atomic transactions	Unit- III Process States and Transitions Layout of System Memory, The Context of a Process, Manipulation of the Process Address Space, Sleep Process Creation/Termination, The User ID of a Process, Changing the Size of a Process. CONCURRENCY AND SYNCHRONIZATION: Process synchronization, critical section problem, Peterson's solution, synchronization hardware, semaphores, classic problems of synchronization, readers and writers problem, dining philosophers problem, monitors, synchronization examples(Solaris), atomic transactions	.....	



		Unit4: Ensemble Learning: AdaBoost, Gradient Boosting, XGBoost (intro),Neural Networks: Perceptron, MLP, DBSCAN clustering algorithm, Dimensionality reduction using t-SNE, Model Evaluation: Accuracy, Precision, Recall, F1-score, ROC-AUC Algorithms: AdaBoost, Gradient Boosting, DBSCAN, Multilayer Perceptron (MLP),t-SNE	Unit4: Ensemble Learning: AdaBoost, Gradient Boosting, XGBoost (intro),Neural Networks: Perceptron, MLP, DBSCAN clustering algorithm, Dimensionality reduction using t-SNE, Model Evaluation: Accuracy, Precision, Recall, F1-score, ROC-AUC Algorithms: AdaBoost, Gradient Boosting, DBSCAN, Multilayer Perceptron (MLP),t-SNE	.....	
M.C.A I Sem-III	Introduction to Artificial Intelligence and Machine learning	Unit1: Definition and Scope of AI and ML, Types of Machine Learning: Supervised, Unsupervised, Reinforcement Learning, Applications of AI in real-world domains, Key concepts in ML: Features, Labels, Model, Training, Testing, Understanding Overfitting, Underfitting, Generalization Steps to build a Machine Learning model: Data Collection → Pre-processing → Model Building → Evaluation → Deployment, Algorithms: Linear Regression, Logistic Regression, Perceptron (introductory NN).	Unit1: Definition and Scope of AI and ML, Types of Machine Learning: Supervised, Unsupervised, Reinforcement Learning, Applications of AI in real-world domains, Key concepts in ML: Features, Labels, Model, Training, Testing, Understanding Overfitting, Underfitting, Generalization Steps to build a Machine Learning model: Data Collection → Pre-processing → Model Building → Evaluation → Deployment, Algorithms: Linear Regression, Logistic Regression, Perceptron (introductory NN).	.....	
		Unit2: Classification and Regression tasks, k-Nearest Neighbours (k-NN), Decision Trees – ID3, Gini, Entropy, Random Forest – Bagging and Ensemble Concept, Support Vector Machines (SVM),Model persistence: Saving and loading models, Data scaling and normalization Algorithms: k-NN, Decision Tree (ID3, CART),Random Forest, Support Vector Machine (SVM)	Unit2: Classification and Regression tasks, k-Nearest Neighbours (k-NN), Decision Trees – ID3, Gini, Entropy, Random Forest – Bagging and Ensemble Concept, Support Vector Machines (SVM),Model persistence: Saving and loading models, Data scaling and normalization Algorithms: k-NN, Decision Tree (ID3, CART),Random Forest, Support Vector Machine (SVM)	.....	
		Unit3: Naïve Bayes: Gaussian, Multinomial, Bernoulli models, Bayes' Theorem and conditional independence, Text pre-processing: Tokenization, Stop words, TF-IDF, Clustering: K-Means, Algorithm, Evaluation with inertia and silhouette score .Dimensionality Reduction: PCA concepts and projection, Hierarchical Clustering overview Algorithms: Naïve Bayes, K-Means Clustering, Principal Component Analysis (PCA),Hierarchical Clustering	Unit3: Naïve Bayes: Gaussian, Multinomial, Bernoulli models, Bayes' Theorem and conditional independence, Text pre-processing: Tokenization, Stop words, TF-IDF, Clustering: K-Means, Algorithm, Evaluation with inertia and silhouette score .Dimensionality Reduction: PCA concepts and projection, Hierarchical Clustering overview Algorithms: Naïve Bayes, K-Means Clustering, Principal Component Analysis (PCA),Hierarchical Clustering	.....	



	Unit4:Ensemble Learning: AdaBoost, Gradient Boosting, XGBoost (intro),Neural Networks: Perceptron, MLP, DBSCAN clustering algorithm, Dimensionality reduction using t-SNE, Model Evaluation: Accuracy, Precision, Recall, F1-score, ROC-AUC Algorithms: AdaBoost, Gradient Boosting, DBSCAN, Multilayer Perceptron (MLP),t-SNE	Unit4:Ensemble Learning: AdaBoost, Gradient Boosting, XGBoost (intro),Neural Networks: Perceptron, MLP, DBSCAN clustering algorithm, Dimensionality reduction using t-SNE, Model Evaluation: Accuracy, Precision, Recall, F1-score, ROC-AUC Algorithms: AdaBoost, Gradient Boosting, DBSCAN, Multilayer Perceptron (MLP),t-SNE	
--	--	--	--

(Signature of the Teacher)



(Signature of the Head of Department)

Name of teacher- Mr. S.M. Gaikwad

Department- MCA

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to Covered	Remark
M.C.A I Sem-I	Computer Networks	Unit-I Networking Devices, Classification of Computer Networks, Network Protocol Stack (TCP/IP and ISO-OSI), Network Standardization and Examples of Networks. Data Transmission Concepts, Analog and Digital Data Transmission, Communication media, Digital modulation techniques (FDMA, TDMA, CDMA), components of computer networks-files server, workstation, network interface unit, transmission media, hub, repeater, bridge, router, gateway, mode. Case study- Prepare/ present report on network components used in any selected organization/Institute/Company.	Unit-I Networking Devices, Classification of Computer Networks, Network Protocol Stack (TCP/IP and ISO-OSI), Network Standardization and Examples of Networks. Data Transmission Concepts, Analog and Digital Data Transmission, Communication media, Digital modulation techniques (FDMA, TDMA, CDMA), components of computer networks-files server, workstation, network interface unit, transmission media, hub, repeater, bridge, router, gateway, mode. Case study- Prepare/ present report on network components used in any selected organization/Institute/Company.	.....	
		Unit-II Data link layer design issues, Error Detection and Correction Codes, Data Link Protocols (Simplex Stop-and-wait protocol for Error free and noisy channel) and Sliding window protocols. The Transport Layer The Transport Service, Elements of Transport Protocols, Congestion Control, The Internet Transport Protocol: UDP, The Internet Transport Protocols – TCP.	Unit-II Data link layer design issues, Error Detection and Correction Codes, Data Link Protocols (Simplex Stop-and-wait protocol for Error free and noisy channel) and Sliding window protocols. The Transport Layer The Transport Service, Elements of Transport Protocols, Congestion Control, The Internet Transport Protocol: UDP, The Internet Transport Protocols – TCP.	.....	
		Unit-III Network Layer Design issues, Routing algorithms, Congestion Control Algorithms, Quality of Service, Internetworking and The Network Layer in the Internet, Store-and-forward packet switching, Services Provided to the Transport Layer, Implementation of Connectionless and Connection Oriented	Unit-III Network Layer Design issues, Routing algorithms, Congestion Control Algorithms, Quality of Service, Internetworking and The Network Layer in the Internet, Store-and-forward packet switching, Services Provided to the Transport Layer, Implementation of Connectionless and Connection Oriented	.....	
		Unit-IV DNS: Domain Name Space, Domain Resource Records, Domain Name Servers. Electronic mail: SMTP, The World Wide Web: Static and dynamic web pages, web applications, HTTP, mobile web. Streaming audio and Video: Digital audio and video, streaming stored and live media, Content delivery: Content and internet traffic, content delivery networks, peer-to-peer	Unit-IV DNS: Domain Name Space, Domain Resource Records, Domain Name Servers. Electronic mail: SMTP, The World Wide Web: Static and dynamic web pages, web applications, HTTP, mobile web. Streaming audio and Video: Digital audio and video, streaming stored and live media, Content delivery: Content and internet traffic, content delivery networks, peer-to-peer networks.	.....	

M.C.A II Sem-III	DATA ANALYTICS USING PYTHON	Unit-I Understanding Modules in Python, Working with Python Modules, Built-in Python Modules, Concept of Libraries and Packages, What is a Library and How Does It Work? , Essential Python Libraries for Data Science: NumPy, Pandas, Matplotlib, Seaborn, OpenCV.	Unit-I Understanding Modules in Python, Working with Python Modules, Built-in Python Modules, Concept of Libraries and Packages, What is a Library and How Does It Work? , Essential Python Libraries for Data Science: NumPy, Pandas, Matplotlib, Seaborn, OpenCV.	.....	
		Unit-II Introduction to NumPy, NumPy Array Object, Creating a Multidimensional Array, NumPy Numerical Types and Data Type Objects, One-Dimensional Slicing and Indexing, Manipulating Array Shapes, NumPy Array Attributes, Broadcasting NumPy Arrays.	Unit-II Introduction to NumPy, NumPy Array Object, Creating a Multidimensional Array, NumPy Numerical Types and Data Type Objects, One-Dimensional Slicing and Indexing, Manipulating Array Shapes, NumPy Array Attributes, Broadcasting NumPy Arrays.	.....	
		Unit-III Introduction to Pandas DataFrames, Introduction to Pandas DataFrames, Creating DataFrames from Lists of Tuples, Data Aggregation in Pandas: Statistical functions, Data Visualization: Using Matplotlib, Using Pandas' Built-in Plotting, Using Seaborn for Advanced Visualizations.	Unit-III Introduction to Pandas DataFrames, Introduction to Pandas DataFrames, Creating DataFrames from Lists of Tuples, Data Aggregation in Pandas: Statistical functions, Data Visualization: Using Matplotlib, Using Pandas' Built-in Plotting, Using Seaborn for Advanced Visualizations.	.....	
		Unit-IV Introduction to Computer Vision, OpenCV Library in Python, Working with Images Getting Started with Images, Basic Operations on Images, Arithmetic Operations on Images, Image Pre-processing Techniques, Edge Detection and Segmentation, Feature Detection and Recognition: Feature Detection and Description, Image Detection and Recognition Examples	Unit-IV Introduction to Computer Vision, OpenCV Library in Python, Working with Images Getting Started with Images, Basic Operations on Images, Arithmetic Operations on Images, Image Pre-processing Techniques, Edge Detection and Segmentation, Feature Detection and Recognition: Feature Detection and Description, Image Detection and Recognition Examples	.....	



(Signature of the Teacher)




(Signature of the Head of Department)

Name of teacher- Miss. Poonam S. Hire-Deore

Department- MCA

Department Name					
Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to Covered	Remark
M.C.A I Sem-I	Database Management System	Unit-I Introduction, Data, Information Metadata, Terminology Of File, Association Between Fields, Entities And Their Attributes, Relationship Record And Files, Abstraction And Data Integration, Association Between Files (Record Types), Conventional File Processing System, Database System, Components Of Database Management System – (Classification Of DBMS Users, The Tree-Level Architecture, Mapping Between View, Data Independence.)	Unit-I Introduction, Data, Information Metadata, Terminology Of File, Association Between Fields, Entities And Their Attributes, Relationship Record And Files, Abstraction And Data Integration, Association Between Files (Record Types), Conventional File Processing System, Database System, Components Of Database Management System – (Classification Of DBMS Users, The Tree-Level Architecture, Mapping Between View, Data Independence.)	.....	
		Unit-II Introduction, Data Association-(Entities, Attributes And Associations, Relationship Among Entities, Representation Of Association And Relationship), Concept Of File Organization – Sequential Files, Index-Sequential Files, Direct Files. Relational Algebra: Basic Operations, Relational Algebra Queries, Relational Calculus: Tuple Calculus, Domain Calculus.	Unit-II Introduction, Data Association-(Entities, Attributes And Associations, Relationship Among Entities, Representation Of Association And Relationship), Concept Of File Organization – Sequential Files, Index-Sequential Files, Direct Files. Relational Algebra: Basic Operations, Relational Algebra Queries, Relational Calculus: Tuple Calculus, Domain Calculus.	.....	
		Unit-III Entity introduction, characteristics, Comparison between DBMS, RDBMS, Generalization and Aggregation Normalization-Functional dependency, types of normalization (1NF,2NF,3NF, BCNF), Data constraint- primary key, foreign key, unique key, null, not null, default key etc.	Unit-III Entity introduction, characteristics, Comparison between DBMS, RDBMS, Generalization and Aggregation Normalization- Functional dependency, types of normalization (1NF,2NF,3NF, BCNF), Data constraint- primary key, foreign key, unique key, null, not null, default key etc.	.....	
		Unit-IV Transaction processing Concurrency - Concept of transaction processing, ACID properties, States of transaction, Serializability, Concurrency control, schemes, Locking techniques, Timestamp based protocols, Granularity of data items, Deadlocks. Database recovery and Backup.	Unit-IV Transaction processing Concurrency - Concept of transaction processing, ACID properties, States of transaction, Serializability, Concurrency control, schemes, Locking techniques, Timestamp based protocols, Granularity of data items, Deadlocks. Database recovery and Backup	.....	

M.C.A II Sem-III	Natural Language Processing	Unit-I History of NLP, Generic NLP system, levels of NLP , Knowledge in language processing , Ambiguity in Natural language , stages in NLP, challenges of NLP ,Applications of NLP Self-learning topics: Empirical laws Morphology analysis – survey of English morphology, Inflectional morphology & Derivational Morphology, Lemmatization, Regular expression, finite automata, finite state transducers (FST), Morphological parsing with FST, Lexicon free FST Porter stemmer. N – Grams- N-gram language model, Self-learning topics: N-gram for spelling	Unit-I History of NLP, Generic NLP system, levels of NLP , Knowledge in language processing , Ambiguity in Natural language , stages in NLP, challenges of NLP ,Applications of NLP Self-learning topics: Empirical laws Morphology analysis – survey of English morphology, Inflectional morphology & Derivational Morphology, Lemmatization, Regular expression, finite automata, finite state transducers (FST), Morphological parsing with FST, Lexicon free FST Porter stemmer. N –Grams- N-gram language model, Self-learning topics: N-gram for spelling	.....	
		Unit-II Syntax analysis : Part-Of-Speech tagging(POS)- Tag set for English (Penn Treebank) , Rule based POS tagging, Stochastic POS tagging, Issues – Multiple tags & words, Unknown words. Introduction to CFG, Sequence labeling: Hidden Markov Model (HMM), Maximum Entropy Self-learning topics: Conditional Random Field (CRF). Module:Semantic Analysis Lexical Semantics, Attachment for fragment of English- sentences, noun phrases, Verb phrases, prepositional phrases, Relations among lexemes & their senses – Homonymy, Polysemy, Synonymy, Hyponymy, Robust Word Sense Disambiguation (WSD),Dictionary based approach Self learning topics:WordNet	Unit-II Syntax analysis : Part-Of-Speech tagging(POS)- Tag set for English (Penn Treebank) , Rule based POS tagging, Stochastic POS tagging, Issues – Multiple tags & words, Unknown words. Introduction to CFG, Sequence labeling: Hidden Markov Model (HMM), Maximum Entropy Self-learning topics: Conditional Random Field (CRF). Module:Semantic Analysis Lexical Semantics, Attachment for fragment of English- sentences, noun phrases, Verb phrases, prepositional phrases, Relations among lexemes & their senses –Homonymy, Polysemy, Synonymy, Hyponymy, Robust Word Sense Disambiguation (WSD),Dictionary based approach Self learning topics:WordNet	.....	
		Unit-III Text Summarization, Text Classification Text summarization- LEXRANK , Optimization based approaches for summarization , Summarization evaluation, Text classification Self-learning topics: NLKT , Naïve Bayes Theorem	Unit-III Text Summarization, Text Classification Text summarization- LEXRANK , Optimization based approaches for summarization , Summarization evaluation, Text classification Self-learning topics: NLKT , Naïve Bayes Theorem	.....	
		Unit-IV Sentiment Analysis and Opinion Mining Sentiment Analysis introduction , Sentiment Analysis - Affective lexicons, Learning affective lexicons, Computing with affective lexicons, Aspect based sentiment analysis Self-learning topics: Named Entity Recognition	Unit-IV Sentiment Analysis and Opinion Mining Sentiment Analysis introduction , Sentiment Analysis - Affective lexicons, Learning affective lexicons, Computing with affective lexicons, Aspect based sentiment analysis Self-learning topics: Named Entity Recognition	.....	



Omish

(Signature of the Teacher)

Vijay

(Signature of the Head of Department)

Name of teacher- Mr. V.V.Shegale

Department- MCA

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to Covered	Remark
M.C.A I Sem-I	Cyber Security	Unit-I Introduction to Cyber security, Defining Cyberspace and Overview of Computer and Web-technology, Architecture of cyberspace, Communication and web technology, Internet, World wide web, Advent of internet, Internet infrastructure for data transfer and governance, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security	Unit-I Introduction to Cyber security, Defining Cyberspace and Overview of Computer and Web-technology, Architecture of cyberspace, Communication and web technology, Internet, World wide web, Advent of internet, Internet infrastructure for data transfer and governance, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security	.....	
		Unit-II Cybercrime and Cyber law, Classification of cybercrimes, Common cybercrimes- cybercrime targeting computers and mobiles, cybercrime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks, Cybercriminals modus-operandi , Reporting of cybercrimes, Remedial and mitigation measures, Legal perspective of cybercrime, IT Act 2000 and its amendments, Cybercrime and offences, Organisations dealing with Cybercrime and Cyber security in India, Case studies : Demonstration of email phishing attack and preventive measures.	Unit-II Cybercrime and Cyber law, Classification of cybercrimes, Common cybercrimes- cybercrime targeting computers and mobiles, cybercrime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks, Cybercriminals modus-operandi , Reporting of cybercrimes, Remedial and mitigation measures, Legal perspective of cybercrime, IT Act 2000 and its amendments, Cybercrime and offences, Organisations dealing with Cybercrime and Cyber security in India, Case studies : Demonstration of email phishing attack and preventive measures.	.....	
M.C.A-I Sem-III	Ethical Hacking	Unit-I What is ethical Hacking? Types of ethical hacking, advantages ,disadvantages and purpose of hacking, types of hackers, code of ethics, Types of attacks and attack vector types, prevention from hackers, The Indian IT Act 2000 and Amendments to the Indian IT Act(2008),phases of hacking.	Unit-I What is ethical Hacking? Types of ethical hacking, advantages ,disadvantages and purpose of hacking, types of hackers, code of ethics, Types of attacks and attack vector types, prevention from hackers, The Indian IT Act 2000 and Amendments to the Indian IT Act(2008),phases of hacking.	.....	
		Unit-II Footprinting and Reconnaissance. What is footprinting? Active and passive footprinting, purpose of footprinting objectives of footprinting, footprinting threats, Types of footprinting, footprinting countenmeasures. Self-Learning Topics: footprinting tools-Learning Topics: footprinting tools.	Unit-II Footprinting and Reconnaissance. What is footprinting? Active and passive footprinting, purpose of footprinting objectives of footprinting, footprinting threats, Types of footprinting, footprinting countenmeasures. Self-Learning Topics: footprinting tools-Learning Topics: footprinting tools.	.....	



		Unit-III Module: Scanning networks, Enumeration and sniffing: Scanning networks: Network scanning and its types, objectives of network scanning, scanning live systems, scanning techniques-TCP Connect Full Open Scan, Types of Stealth scans, Port scanning countermeasures, IDS evasion techniques, Banner grabbing and its tools, vulnerability scanning, proxy servers, anonymizes, IP spoofing and its countermeasures. Enumeration and Sniffing: What is Enumeration? Enumeration techniques, Enumeration types, Enumeration countermeasures, what is sniffing? Wiretapping and its types, packet sniffing, sniffing threats, how sniffers work?, sniffing methods-ARP spoofing and MAC flooding, active and passive sniffing, types of sniffing attacks, sniffing countermeasures, sniffing detection techniques.	Unit-III Module: Scanning networks, Enumeration and sniffing: Scanning networks: Network scanning and its types, objectives of network scanning, scanning live systems, scanning techniques-TCP Connect Full Open Scan, Types of Stealth scans, Port scanning countermeasures, IDS evasion techniques, Banner grabbing and its tools, vulnerability scanning, proxy servers, anonymizes, IP spoofing and its countermeasures. Enumeration and Sniffing: What is Enumeration? Enumeration techniques, Enumeration types, Enumeration countermeasures, what is sniffing? Wiretapping and its types, packet sniffing, sniffing threats, how sniffers work?, sniffing methods-ARP spoofing and MAC flooding, active and passive sniffing, types of sniffing attacks, sniffing countermeasures, sniffing detection techniques.	.....	
		Unit-IV Worms, viruses, Trojans, Types of worms, viruses and worms, Preventing malware attacks, types of attacks: (DOS /DDoS), Waterhole attack, brute force, phishing and fake WAP, Eavesdropping, Man-in-the-Middle, buffer overflow, DNS poisoning, ARP poisoning, Identity Theft, 10T Attacks, BOTs and BOTNETs, Steganography - text, image and audio and video, types of Social Engineering: Physical social engineering, Remote social engineering and hybrid social engineering.	Unit-IV Worms, viruses, Trojans, Types of worms, viruses and worms, Preventing malware attacks, types of attacks: (DOS /DDoS), Waterhole attack, brute force, phishing and fake WAP, Eavesdropping, Man-in-the-Middle, buffer overflow, DNS poisoning, ARP poisoning, Identity Theft, 10T Attacks, BOTs and BOTNETs, Steganography - text, image and audio and video, types of Social Engineering: Physical social engineering, Remote social engineering and hybrid social engineering.	.....	
M.C.A-I Sem-III	User Interface	Unit-I Introduction: Usability of Interactive Systems: Introduction, Usability Goals and Measures, Usability Motivation, Universal Usability, Goals for our profession. Guideline, principles, and theories: Introduction, Guidelines, principles, Theory Development Processes: Managing Design Processes: Introduction, Organizational Design to support Usability, The Four Pillars of Design, Development methodologies: Ethnographic Observation, Participatory Design, Scenario Development, Social Impact statement for Early Design Review, Legal Issues.	Unit-I Introduction: Usability of Interactive Systems: Introduction, Usability Goals and Measures, Usability Motivation, Universal Usability, Goals for our profession. Guideline, principles, and theories: Introduction, Guidelines, principles, Theory Development Processes: Managing Design Processes: Introduction, Organizational Design to support Usability, The Four Pillars of Design, Development methodologies: Ethnographic Observation, Participatory Design, Scenario Development, Social Impact statement for Early Design Review, Legal Issues.	.....	



	Unit-II Evaluating Interface: Design Introduction, Expert Reviews, Usability Testing and Laboratories, Survey Instruments, Acceptance tests, Evaluation during Active Use, Controlled Psychologically Oriented Experiments. Direct Manipulation and Virtual Environments: Introduction, Examples of Direct Manipulation, Discussion of direct manipulation, 3D Interfaces, Tele-operation, Virtual and Augmented Reality Menu Selection, Form Filling and Dialog Boxes: Introduction, Task-Related Menu Organization, Single Menus, Combination of Multiple Menus, Content Organization, Fast Movement Through Menus, Data Entry With Menus, Form Filling, Dialog Boxes and Alternatives, Audio Menus and Menus for Small Displays	Unit-II Evaluating Interface: Design Introduction, Expert Reviews, Usability Testing and Laboratories, Survey Instruments, Acceptance tests, Evaluation during Active Use, Controlled Psychologically Oriented Experiments. Direct Manipulation and Virtual Environments: Introduction, Examples of Direct Manipulation, Discussion of direct manipulation, 3D Interfaces, Tele-operation, Virtual and Augmented Reality Menu Selection, Form Filling and Dialog Boxes: Introduction, Task-Related Menu Organization, Single Menus, Combination of Multiple Menus, Content Organization, Fast Movement Through Menus, Data Entry With Menus, Form Filling, Dialog Boxes and Alternatives, Audio Menus and Menus for Small Displays		
--	--	--	-------	--

(Signature of the Teacher)

(Signature of the Head of Department)

VIVEKANAND COLLEGE, KOLHAPUR (EMPOWERED AUTONOMOUS)

STATEMENT OF SYLLABUS COVERED

Year- 2025-26

Term- II

Name of teacher- Mr. Vijay Bapuso Pujari

Department- MCA

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to Covered	Remark
M.C.A I Sem-II	Advance Java	Unit-1 Applet Fundamentals: Applets: Applet Fundamentals – Applet Class – Applet Life Cycle – Steps for developing an Applet Program – Passing values through Parameters – Graphics in an Applet – Event handling. GUI Applications: Graphical User Interface – Creating Windows – Dialog Boxes – Layout Managers – AWT Component classes – Swing Component classes – Event handling – Other AWT Components – AWT graphics classes – Other Swing controls. Java Database Connectivity: Types of drivers – JDBC Architecture – JDBC Classes and Interfaces – Basic steps in developing JDBC application – Creating a new database and table with JDBC – Working with Database metadata. Servlets: Basics – Advantages – Servlet alternatives – strengths – Architectures – Servlet Life Cycle – Generic Servlet – HTTP Servlet – Passing parameters – Retrieving parameters – server side include – Cookies – Filters.	Unit-1 Applet Fundamentals: Applets: Applet Fundamentals – Applet Class – Applet Life Cycle – Steps for developing an Applet Program – Passing values through Parameters – Graphics in an Applet – Event handling. GUI Applications: Graphical User Interface – Creating Windows – Dialog Boxes – Layout Managers – AWT Component classes – Swing Component classes – Event handling – Other AWT Components – AWT graphics classes – Other Swing controls. Java Database Connectivity: Types of drivers – JDBC Architecture – JDBC Classes and Interfaces – Basic steps in developing JDBC application – Creating a new database and table with JDBC – Working with Database metadata. Servlets: Basics – Advantages – Servlet alternatives – strengths – Architectures – Servlet Life Cycle – Generic Servlet – HTTP Servlet – Passing parameters – Retrieving parameters – server side include – Cookies – Filters.	.....	
		Unit2: Java Server Pages: Java Server Pages: Overview – JSP and HTTP – JSP Engines – Working of JSP – Anatomy of JSP – JSP Syntax – Creating simple JSP page – Components of JSP – Implicit Objects. Web Programming – Client Side Programming: Client Side Programming technologies – form design with HTML and CSS – Client side	Unit2: Java Server Pages: Java Server Pages: Overview – JSP and HTTP – JSP Engines – Working of JSP – Anatomy of JSP – JSP Syntax – Creating simple JSP page – Components of JSP – Implicit Objects. Web Programming – Client Side Programming: Client Side Programming technologies – form design with HTML and CSS – Client side	.....	



		Validation using JavaScript – Content Structuring using XML – Adding interactivity with AJAX. Web Programming – Server Side Programming: Web Servers – Handling Request and Response – Database Access – Session Management	Validation using JavaScript – Content Structuring using XML – Adding interactivity with AJAX. Web Programming – Server Side Programming: Web Servers – Handling Request and Response – Database Access – Session Management		
--	--	---	---	--	--

(Signature of the Teacher)



(Signature of the Head of Department)

Name of teacher- Mr. M.A.Jadhav

Department- MCA

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to Covered	Remark
M.C.A I Sem-II	Object Oriented Programming with Python	Unit I: Introduction to Python – Advantages of using Python – Executing Python Programs – Python's Core data types – Numeric Types – String Fundamentals, Operators and Operands in Python. (Arithmetic, relational and logical operators), Operator precedence .Expressions and Statements (Assignment statement); Taking input (using raw_input() and input()) and displaying output - print statement , Comments in Python. Conditional and Looping Construct if - else statement and nested if – else while, for, use of range function in for, Nested loops , break, continue.	Unit I: Introduction to Python – Advantages of using Python – Executing Python Programs – Python's Core data types – Numeric Types – String Fundamentals, Operators and Operands in Python. (Arithmetic, relational and logical operators), Operator precedence .Expressions and Statements (Assignment statement); Taking input (using raw_input() and input()) and displaying output - print statement , Comments in Python. Conditional and Looping Construct if - else statement and nested if – else while, for, use of range function in for, Nested loops , break, continue.	.....	
		Unit-II: Classes and Object Oriented programming with Python - Modules and Packages: Purpose, using packages– Exception Handling with Python, Built-In Function, invoking built in functions , Functions from math, random, time & date, User Define Function . Strings:, Creating, initializing and accessing the elements; String operators: +, *, in, not in, range, slice [n:m] , String built in functions & methods ,Strings constants defined in string module, Regular Expression and Pattern Matching.	Unit-II: Classes and Object Oriented programming with Python - Modules and Packages: Purpose, using packages– Exception Handling with Python, Built-In Function, invoking built in functions , Functions from math, random, time & date, User Define Function . Strings:, Creating, initializing and accessing the elements; String operators: +, *, in, not in, range, slice [n:m] , String built in functions & methods ,Strings constants defined in string module, Regular Expression and Pattern Matching	.....	
		Unit III: Database Handling using Python – NumPy – Pandas – Machine learning with Python – Data Visualization in Python. Lists : Concept of mutable lists, creating, initializing and accessing the elements of list ,List operations. Tuples : Immutable concept, creating, initializing and accessing the elements in a tuple; Tuple functions: cmp(), len(), max(), min(), tuple() .Sets :Concept of Sets , creating, initializing and accessing the elements of ,Sets operation(Membership, union, intersection, difference, and symmetric difference. Dictionaries :Concept of key-value pair, creating, initializing and accessing the elements in a dictionary, Traversing, Dictionary functions & Methods.	Unit III: Database Handling using Python – NumPy – Pandas – Machine learning with Python – Data Visualization in Python. Lists : Concept of mutable lists, creating, initializing and accessing the elements of list ,List operations. Tuples : Immutable concept, creating, initializing and accessing the elements in a tuple; Tuple functions: cmp(), len(), max(), min(), tuple() .Sets :Concept of Sets , creating, initializing and accessing the elements of ,Sets operation(Membership, union, intersection, difference, and symmetric difference. Dictionaries :Concept of key-value pair, creating, initializing and accessing the elements in a dictionary, Traversing, Dictionary functions & Methods.	.....	



		Unit IV: Concept of class, object and instances Constructor, class attributes and destructors Real time use of class in live projects Inheritance , overlapping and overloading operators Adding and retrieving dynamic attributes of classes Programming using Oops support Python Exceptions Handling What is Exception? Handling various exceptions using try....except...else ,Try-finally clause,Argument of an Exception and create self exception class,Python Standard Exceptions Raising an exceptions, User-Defined Exceptions	Unit IV: Concept of class, object and instances Constructor, class attributes and destructors Real time use of class in live projects Inheritance , overlapping and overloading operators Adding and retrieving dynamic attributes of classes Programming using Oops support Python Exceptions Handling What is Exception? Handling various exceptions using try....except...else ,Try-finally clause,Argument of an Exception and create self exception class,Python Standard Exceptions Raising an exceptions, User-Defined Exceptions		
--	--	--	---	-------	--

(Signature of the Teacher)



(Signature of the Head of Department)

Name of teacher- Mr. S.M.Gaikwad

Department- MCA

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to Covered	Remark
M.C.A I Sem-II	Software Engineering	Unit I: Software and Software Engineering: The nature of Software, The unique nature of WebApps, Software Engineering, The software Process, Software Engineering Practice, Software Myths. Process Models: A generic process model, Process assessment and improvement, Prescriptive process models: Waterfall model, Incremental process models, Evolutionary process models, Concurrent models, Specialized process models. Unified Process , Personal and Team process models	Unit I: Software and Software Engineering: The nature of Software, The unique nature of WebApps, Software Engineering, The software Process, Software Engineering Practice, Software Myths. Process Models: A generic process model, Process assessment and improvement, Prescriptive process models: Waterfall model, Incremental process models, Evolutionary process models, Concurrent models, Specialized process models. Unified Process , Personal and Team process models	.....	
		Unit II: Groundwork for Understanding of Software, Requirements; Overview of Eliciting Requirements, Developing Use Cases, Building the Requirements Model; Negotiating Requirements; Validating Requirements; Requirement Modelling Strategies; Overview of Flow Oriented Modelling, Behavioural Modelling	Unit II: Groundwork for Understanding of Software, Requirements; Overview of Eliciting Requirements, Developing Use Cases, Building the Requirements Model; Negotiating Requirements; Validating Requirements; Requirement Modelling Strategies; Overview of Flow Oriented Modelling, Behavioural Modelling	.....	
		Unit III: Design Model; Architectural Styles, Architectural Design, Assessing Alternative architectural Designs, Architectural mapping Using Data Flow, User Interface Design: Golden Rules of User Interface Design; User Interface Analysis and Design; Interface Analysis; Interface Design steps	Unit III: Design Model; Architectural Styles, Architectural Design, Assessing Alternative architectural Designs, Architectural mapping Using Data Flow, User Interface Design: Golden Rules of User Interface Design; User Interface Analysis and Design; Interface Analysis; Interface Design steps	.....	



	Unit IV:Introduction, The place of software quality in project planning, Importance of software quality, Defining software quality, Software quality models, product versus process quality management. Software Project Estimation: Observations on Estimation, Decomposition Techniques, Empirical Estimation Models.	Unit IV:Introduction, The place of software quality in project planning, Importance of software quality, Defining software quality, Software quality models, product versus process quality management. Software Project Estimation: Observations on Estimation, Decomposition Techniques, Empirical Estimation Models.		
--	---	---	-------	--

(Signature of the Teacher)

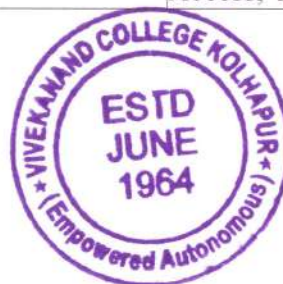


(Signature of the Head of Department)

Name of teacher- Miss. P.S.Hire-Deore

Department- MCA

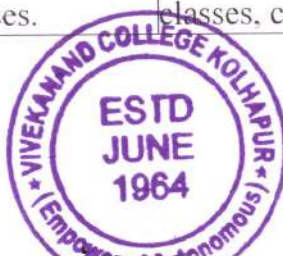
Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to Covered	Remark
M.C.A I Sem-II	Cloud Computing	Unit I: Cloud Computing: Definition, roots of cloud computing, characteristics, cloud architecture, Computing Introduction to Cloud Computing, History and Evolution of Cloud Computing, Types of clouds, Private Public and hybrid clouds, Cloud Computing architecture, Cloud computing infrastructure	Unit I: Cloud Computing: Definition, roots of cloud computing, characteristics, cloud architecture, Computing Introduction to Cloud Computing, History and Evolution of Cloud Computing, Types of clouds, Private Public and hybrid clouds, Cloud Computing architecture, Cloud computing infrastructure	.....	
		Unit II: Cloud Computing Service Platforms – compute services, storage services, database services, application services, queuing services, e-mail services, notification services, media services, content delivery services, analytics services, deployment & management services, Security in cloud computing: issues, threats, data security and information security Cloud Computing Companies and Migrating to Cloud Web-based business services. Virtualization: benefits & drawbacks of virtualization, server virtualization, virtualization of – operating system, platform, CPU, network, application, memory and I/O devices etc	Unit II: Cloud Computing Service Platforms – compute services, storage services, database services, application services, queuing services, e-mail services, notification services, media services, content delivery services, analytics services, deployment & management services, Security in cloud computing: issues, threats, data security and information security Cloud Computing Companies and Migrating to Cloud Web-based business services. Virtualization: benefits & drawbacks of virtualization, server virtualization, virtualization of – operating system, platform, CPU, network, application, memory and I/O devices etc	.....	
	Information Security	Unit I: Introduction, Definition of security, Assessing security, Security terminology , Historical developments, Structure of security, Introduction to Information Security, The Need for Security , Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The Security SDLC	Unit I: Introduction, Definition of security, Assessing security, Security terminology , Historical developments, Structure of security, Introduction to Information Security, The Need for Security , Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The Security SDLC	.....	



	Unit II: Risk Management and Special requirements such as Emanation Security/TEMPEST Standards, Planning for Security, Rainbow Series Reports for DOD; DHS and CNSS guidance: Firewalls & VPNs, Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues - An Overview of Computer Security - Access Control Matrix, Policy-Security policies, Confidentiality policies, Integrity policies and Hybrid policies	Unit II: Risk Management and Special requirements such as Emanation Security/TEMPEST Standards, Planning for Security, Rainbow Series Reports for DOD; DHS and CNSS guidance: Firewalls & VPNs, Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues - An Overview of Computer Security - Access Control Matrix, Policy-Security policies, Confidentiality policies, Integrity policies and Hybrid policies	.....	
	Unit III: Applications of cryptography, Terminology, Evolution of cryptography, Caesar ciphers, one-time pads, Operation of DES, AES, Public-key cryptosystems, Topics in Information Systems Security :- Minimum privilege, Compartmentalization, Dual controls, Security perimeters, Single-points-of-failure, Covert channels, Inference, Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk - Systems: Access Control Mechanisms, Information Flow and Confinement Problem.	Unit III: Applications of cryptography, Terminology, Evolution of cryptography, Caesar ciphers, one-time pads, Operation of DES, AES, Public-key cryptosystems, Topics in Information Systems Security :- Minimum privilege, Compartmentalization, Dual controls, Security perimeters, Single-points-of-failure, Covert channels, Inference, Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk - Systems: Access Control Mechanisms, Information Flow and Confinement Problem.	.....	
	Unit IV: Technology: Blueprint for Security, IDS and Access Control Cryptography, Physical Security including Emanations Security, Handling, labelling and destruction of Sensitive information) Implementing Security, Security and Personnel, Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel, Secure programming languages-concepts structured multiprogramming, shared classes, cooperating sequential processes.	Unit IV: Technology: Blueprint for Security, IDS and Access Control Cryptography, Physical Security including Emanations Security, Handling, labelling and destruction of Sensitive information) Implementing Security, Security and Personnel, Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel, Secure programming languages-concepts structured multiprogramming, shared classes, cooperating sequential processes.	.....	

Delia

(Signature of the Teacher)



Vivekanand

(Signature of the Head of Department)

Name of teacher- Mr. V.V.Shegale

Department- MCA

Class	Subject	Syllabus assigned	Syllabus Covered	Syllabus not to Covered	Remark
M.C.A I Sem-II	Advanced Web Technology	Unit I: Introduction, Common Infrastructure, Semantics, structure, and APIs of HTML documents, Elements, links, Tabular data, Forms & Script elements, Web Application APIs, The XHTML syntax, User Interaction & Loading web pages.	Unit I: Introduction, Common Infrastructure, Semantics, structure, and APIs of HTML documents, Elements, links, Tabular data, Forms & Script elements, Web Application APIs, The XHTML syntax, User Interaction & Loading web pages.	.....	
		Unit II: PHP Basics Introduction to Server-side programming, PHP variables, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, String, Form processing, File uploads, Dates and time zone, Working with Regular Expressions, Exception Handling, Working with JSON data, Object Oriented Programming with PHP	Unit II: PHP Basics Introduction to Server-side programming, PHP variables, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, String, Form processing, File uploads, Dates and time zone, Working with Regular Expressions, Exception Handling, Working with JSON data, Object Oriented Programming with PHP	.....	
		Unit III: Laravel Introduction to Laravel and MVC, Environment Setup, Routes, Namespaces, Controllers, Views, Request Response, Redirections, Forms, Session, Cookies, Database connectivity and CRUD Operations.	Unit III: Laravel Introduction to Laravel and MVC, Environment Setup, Routes, Namespaces, Controllers, Views, Request Response, Redirections, Forms, Session, Cookies, Database connectivity and CRUD Operations.	.....	
		Unit IV: Introduction to AngularJS: Expressions, Modules, Directives, Directive, Data Binding, Controllers, Scope, Filters, Services, AngularJS AJAX, Tables, Select Boxes.Introduction to Node JS: Advantages of Node JS, Setup Development Environment, Functions, Buffer, Module, Modules Types, Node Package Manager, Creating Web Server, File System, Debugging Node JS Application, Events.	Unit IV: Introduction to AngularJS: Expressions, Modules, Directives, Directive, Data Binding, Controllers, Scope, Filters, Services, AngularJS AJAX, Tables, Select Boxes.Introduction to Node JS: Advantages of Node JS, Setup Development Environment, Functions, Buffer, Module, Modules Types, Node Package Manager, Creating Web Server, File System, Debugging Node JS Application, Events.	.....	


(Signature of the Teacher)




(Signature of the Head of Department)