Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Computer Applications
Name of Program: MCA (Banking Technology)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCBT301	DCC	Biometric Systems in Banking	3	1	0	4	60	20	20	0	0

Legends: L – Lecture; T – Tutorial/Teacher Guided Student Activity; P – Practical; Q/A – Quiz/Assignment/Attendance; MST – Mid Semester Test.

*Teacher Assessment shall be based on following components: Quiz/Assignment/Project/Participation in class activities, given that no component shall exceed more than 10 marks

Course Education Objectives (CEOs):

- To introduce biometric traits and its aim, image processing basics, basic image operations.
- Understand the various methods of password management and protocols to maintain system security.

Course Outcomes (COs):

After the successful completion of this course students will be able to: -

- Elaborate the security aspects in biometrics.

- Explore biometric application areas.

- Understand the various methods of password management and protocols to maintain system security.

- Describe different concepts related to the biometrics and image processing.

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MCBT301	DCC	Biometric Systems in Banking	3	1	0	4	60	20	20	0	0

Unit-I

BIOMETRIC FUNDAMENTALS AND STANDARDS:

Definition, Biometrics versus traditional techniques, Characteristics, Key biometric processes: Verification, Identification, Biometric matching, Performance measures in biometric systems, Assessing the privacy risks of biometrics, Designing privacy sympathetic biometric systems, Different biometric standards, Application properties.

Unit-II

PHYSIOLOGICAL BIOMETRICS:

Facial scan, Ear scan, Retina scan, Iris scan, Finger scan, Automated finger-print identification system, Palm print, Hand vascular geometry analysis, DNA, Dental.

Unit-III

BEHAVIOURAL BIOMETRICS:

Signature scan, Keystroke scan, Voice scan, Gait recognition, Gesture recognition, Video face, Mapping the body technology.

Unit-IV

USER INTERFACES:

Biometric interfaces: Human machine interface BHMI structure, Human side interface: Iris image interface, Hand geometry and fingerprint sensor, Machine side interface: Parallel port, Serial port, Network topologies, Case study: Palm scanner interface.

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							THEORY			PRACTICAL	
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MCBT301	DCC	Biometric Systems in Banking	3	1	0	4	60	20	20	0	0

Unit-V

BIOMETRIC APPLICATIONS:

Categorizing biometric applications, Application areas: Criminal and citizen identification, Surveillance PC/network access, Ecommerce and retail/ATM, Costs to deploy, Issues in deployment, Biometrics in medicine, cancellable biometrics.

Text Books:

1. Paul Reid, "Biometrics for Network Security", First Edition, Prentice Hall, 2004.
2. Nalini Ratha, Ruud Bolle, "Automatic Fingerprint Recognition System", Springer, 2004.
3. Laxmi C. Jain, U. Halici, I. Hayashi, S. B. Lee, S. Tsutsui, "Intelligent Biometric Techniques in Fingerprint and Face Recognition", First Edition, Routledge, 1999.
4. S. Y. Kung, M.W. Mak, S. H. Lin, "Biometric Authentication: A Machine Learning Approach", First Edition, Prentice Hall, 2010.

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MCA302	DCC	Software Engineering	3	0	0	3	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical;   C - Credit;
Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.
*Teacher Assessment shall be based on following components: Quiz / Assignment / Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Education Objectives (CEOs):

- To provide knowledge about system development.
- To impart knowledge about software process models.
- To provide detailed knowledge about software design.
- To acquaint students with software quality and testing.
- To provide study of MIS.

Course Outcomes (COs): Students will be having:

- An ability to understand system design and its constraints.
- An ability to apply knowledge of software engineering.
- An ability to design a system, a component or process to meet desired needs.
- An ability to identify, formulate and solve engineering Problems
- An ability to measure and to understand quality issues.
- An ability to understand MIS and DSS.

UNIT -I

Introduction to Software Engineering: Software problem, Software engineering problem, Software engineering approach, Software characteristics and Applications. System's concept, characteristics of system, elements of system, The System Development Life Cycle, The Role of System Analyst.

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCA302	DCC	Software Engineering	3	0	0	3	60	20	20	0	0

UNIT -II

Software Processes: Software processes and its components, characteristics of software processes, Software development processes: Linear Sequential model, Prototyping model, RAD model, Iterative Enhancement model, Spiral model, Component based development, Comparative study of various development models.

UNIT-III

Software Project Planning: Project planning objectives, Decomposition Techniques, Empirical estimation models, The Make/Buy Decision., Risk analysis. Software Design: Design Principles, Cohesion & Coupling.

UNIT-IV

Software Quality Assurance: Quality Concepts, The Quality Movement. Software Reviews: Formal Technical Reviews. Statistical Software Quality Assurance, Software Reliability. **Software Testing Techniques:** Testing fundamentals, White box testing, Black box testing. Testing Strategies: A strategic approach of software testing strategic issues, unit testing, integration testing, validation testing, system testing.

UNIT-V

MIS & DSS: Introduction to MIS, long range planning, development and implementation of an MIS, Applications of MIS in manufacturing sector and service sector. Decision Support System concepts, types of DSS.

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MCA302	DCC	Software Engineering	3	0	0	3	60	20	20	0	0

Text Books:

1. R. S. Pressman, "Software Engineering – A practitioner's approach", 6th ed., McGraw Hill Int.
2. Pankaj Jalote "Software Engineering", Kindle Edition, Wiley Publications.
3. Ian Sommerville : Software Engineering 6thedition (Addison-Wesley).
4. Richard Fairley : Software Engineering Concepts (TMH).
5. Elis Awad, "System Analysis & Design", Galgotia publications.
6. W.S. Jawadekar: Management Information Systems, TMH Publication, India.

Practical List:

1. To study the Software Development Life Cycle.
2. To understand and apply good Software Analysis and Design practices
3. To study Data Flow Diagrams (DFDs) and levels in DFDs.
4. To create Data Dictionary for some applications
5. To use various information gathering tools (Questionnaire, Interview, On Site Survey)
6. To choose suitable software development process models for developing different applications.
7. Perform Feasibility Study and to create Feasibility Report for applications.
8. To make decision whether to buy/lease/ develop the software.
9. To understand and create Use Case Diagram.
10. To study Functional Point Analysis.
11. To devise Test Cases for software testing, black-box, white-box testing and different types of testing.
12. To study the Risk Management during the software development.
13. To assure Quality of Software, Statistical Software Quality Assurance, Reliability of Software.
14. To understand and apply concepts of Project Management
15. Case study (MIS and DSS)

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCA311	DEC	Cloud Computing	3	0	0	3	60	20	20	0	0

Legends: L – Lecture; T – Tutorial/Teacher Guided Student Activity; P – Practical; Q/A – Quiz/Assignment/Attendance. MST – Mid Semester Test.
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Course Education Objectives (CEOs):

The goal of this course is to provide students with an understanding of basic concepts of cloud computing along with cloud computing architecture, cloud management and cloud security.

Course Outcomes (COs): After course completion Students will be able to understand:

- Concept of cloud computing with broader perspective of cloud architecture and reference models.

- Theory of cloud Management and its security.

- Virtualization Technology Management.

- Applications of cloud computing with the help of some important commercial systems like Google App Engine, Microsoft Azure and Amazon.

Unit-I

Cloud Computing: Introduction, Historical development, principles and vision, Cloud services requirements, Types of Clouds, Advantages and disadvantages of cloud computing, effect of cloud computing on human lives, Characteristics of Cloud Computing, Cloud and dynamic infrastructure, key elements in adopting cloud, Cloud adoption rudiments.

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							\multicolumn TEACHING & EVALUATION SCHEME				
MCA311	DEC	Cloud Computing	3	0	0	3	60	20	20	0	0

Unit-II

Architecture for Cloud Computing: Cloud Computing Environments, Characteristics of cloud computing as per NIST, Concepts of Deployment Models and Service Models, Cloud Interoperability &Standards, Scalability and Fault Tolerance.

Cloud Solutions: Cloud Ecosystem and its benefits, Cloud Business Process Management, Cloud Service Management.

Cloud Offerings: Cloud Analytics, Testing Under Control.

Unit-III

Cloud Management: Resiliency, Provisioning, Asset management, Concepts of Map reduce, Cloud Governance, High Availability and Disaster Recovery. Market Based Management of Clouds, Federated Clouds/Inter Cloud: Characterization & Definition.

Unit-IV

Virtualization Technology: Introduction, working process of virtualization and benefits of virtualization. **Type of virtualization:** Hardware Virtualization, Software Virtualization, Memory Virtualization, Storage Virtualization, Data and Network Virtualization, Desktop and Application virtualization. Technology used for virtualization, Hypervisor Virtualization Software, Virtual LAN (VLAN) and Virtual SAN(VSAN) with their benefits.

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MCA311	DEC	Cloud Computing	3	0	0	3	60	20	20	0	0

Unit-V

Cloud Security: Introduction of cloud Information security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, and Security Challenges. Introduction of cloud applications: ECG Analysis in the cloud. CRM and ERP, Social networking.

Case study of cloud computing platforms: Google App Engine, Microsoft Azure, Hadoop. Amazon.

Textbooks:

1. Judith S. Hurwitz, Daniel Kirsch" Cloud Computing For Dummies, 2nd Edition,John Wiley and Sons inc., New Jersey, 2000.
2. Hashmi, Tahir, Landreau, Jean-Francois" Cloud Strategy: A Decision-based Approach to cloud migration" GregorHohpe:An architect Elevator Guide,2019-2020.
3. Kavis, Michael J. "Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, and IaaS) John Wiley and Sons inc., Hoboken, New Jersey, 2000.
4. Mr. Ray J Rafaels "Cloud Computing: From Beginning to End" Second edition, paperback,2018.

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							THEORY			PRACTICAL	
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MCA321	DEC	Internet of Things	3	0	0	3	60	20	20	0	0

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Course Education Objectives (CEOs):

- Vision and Introduction to IoT.
- Understand IoT Market perspective.
- Data and Knowledge Management and use of Devices in IoT Technology.
- Understand State of the Art – IoT Architecture.
- Real World IoT Design Constraints, Industrial Automation and Commercial Building Automation in IoT.

Course Outcomes (COs):

At the end of the course the student will be able to:

- Understand the vision of IoT from a global context.
- Determine the Market perspective of IoT.
- Use of Devices, Gateways and Data Management in IoT.
- Building state of the art architecture in IoT.
- Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints

Unit-I

Introduction to the internet of things – origins, early concepts and products, Examples of current products and value propositions, Architectures and design patterns, Analysis of a full connected- object experience. State of the Art, challenges and future directions. Role of Cloud in IoT, Security aspects in IoT.

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCA321	DEC	Internet of Things	3	0	0	3	60	20	20	0	0

Unit-II

Elements of IoT: Hardware Components- Computing (Arduino, Raspberry Pi), Communication, Sensing, Actuation, I/O interfaces. Software Components- Programming API's (using Python/Node.js/Arduino) for Communication Protocols-MQTT, ZigBee, Bluetooth, CoAP, UDP, TCP.

Unit-III

IoT Application Development: Solution framework for IoT applications- Implementation of Device integration, Data acquisition and integration.

Unit-IV

Device data storage: Unstructured data storage on cloud/local server, Authentication, authorization of devices.

Unit-V

IoT Case Studies: IoT case studies and mini projects based on Industrial automation,Home Automation.

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MCA321	DEC	Internet of Things	3	0	0	3	60	20	20	0	0

Text Books:

1. Vijay Madisetti, ArshdeepBahga, Ïnternet of Things, "A Hands on Approach", University Press.
2. Dr. SRN Reddy, Rachit Thukral and Manasi Mishra, "Introduction to Internet of Things: Apractical Approach", ETILabs.
3. Jeeva Jose, "Internet of Things", Edition 2018, Khanna Publishing House, Delhi.
4. Adrian McEwen, "Designing the Internet of Things", Edition 2013, Wiley.
5. Raj Kamal, "Internet of Things: Architecture and Design", Edition 2017, McGrawHill.

Reference Books:

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press,2014.
2. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications,2013

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							TEACHING & EVALUATION SCHEME				
MCA331	DEC	Distributed Systems	3	0	0	3	60	20	20	0	0

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Course Education Objectives (CEOs):

- Understand foundations of Distributed Systems
- Understand the network virtualization, remote method invocation and objects and RPC.
- Introduce the idea of peer to peer services and file system
- Methods of understanding clock synchronization protocols &replication
- Understand the issues involved in studying process and resource management

Course Outcomes (COs):

- Discuss trends in Distributed Systems
- Demonstrate an understanding of the challenges faced by future distributed systems
- Learn and apply the concept of network virtualization and remote method invocation
- Apply network virtualization in Real time systems like
- Analyze the mechanism of peer to peer systems, DFS and DNS.
- Understand key mechanisms and models for distributed systems including logical clocks,
- Causality, distributed mutual exclusion, distributed deadlocks.
- Design process and resource management systems.

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							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCA331	DEC	Distributed Systems	3	0	0	3	60	20	20	0	0

UNIT-I

Concepts of Distributed Systems: Introduction, Goals of Distributed Systems, Examples of distributed Systems Distributed

Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks,Lamport's& vectors logical clocks.

UNIT-II

Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and Non Token based algorithms.

Distributed Deadlock Detection: system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms, edge chasing algorithms.

UNIT-III

Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem.

Distributed Objects and Remote Invocation: Communication between distributed objects, Remote procedure call, Events and notifications.

UNIT-IV

Distributed File Systems: File service architecture, Sun Network File System, The Andrew File System.
Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery

Chairperson	Chairperson	Controller of Examination	Joint Registrar
Board of Studies	Faculty of Studies	Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth
Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth	Vishwavidyalaya, Indore	Vishwavidyalaya, Indore
Vishwavidyalaya, Indore	Vishwavidyalaya, Indore		

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MCA331	DEC	Distributed Systems	3	0	0	3	60	20	20	0	0

UNIT-V

Replication: System model and group communication, Fault-tolerant services, Transactions with replicated data. Distributed Algorithms: Destination based routing, APP (assignment problem in parallel), Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Election algorithm.

Text Books:

1. Sinha P. K., "Distributed operating systems; Concepts and design", PHI Learning.
2. Mahajan S. & Shah, Distributed Computing, Oxford Press
3. Singhal&Shivaratri, "Advanced Concept in Operating Systems", McGraw Hill.
4. Tanenbaum and Steen, "Distributed systems: Principles and paradigms", 2nd edition, PHI Learning.
5. Coulouris, Dollimore, Kindberg, "Distributed System: Concepts and Design", Pearson Ed.
6. Gerald Tel, "Distributed Algorithms", Cambridge University Press.

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MCA312	DEC	Data Mining and Warehousing	3	0	0	3	60	20	20	0	0

Legends: L -Lecture; T -Tutorial/Teacher Guided Student Activity; P –Practical; C -Credit; Q/A – Quiz/Assignment/Attendance, MST -Mid Sem Test.
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Course Educational Objectives (CEOs):
- To familiarize the students with the need and scope of the subject.
- To build the mental makeup of the students for the field of data mining
- To develop a better understanding of the recent techniques like Support Vector Machine, Rough Set Theory etc as the tools of data mining.
- Using simple and well drawn illustrations develop students skills to discover knowledge to support the decision making process.
- To make the students well versed with the latest trends in data warehousing and data mining.

Course Outcomes (Cos): The student will be able to
- Understand the basic principles, concepts and applications of data warehousing and data mining
- introduce the task of data mining as an important phase of knowledge recovery process
- Ability to do Conceptual, Logical and Physical design of Data Ware houses, OLAP applications and OLAP deployment
- Have a good knowledge of the fundamental concepts that provide the foundation of data mining
- Design and implement adata warehouse or data mart to present information needed by management in a form that is usable for management client
- Design and implement the data pre-processing solutions for different applications
- Identify and use suitable data mining techniques for Knowledge Discovery
- Develop dashboard solutions for presentation of knowledge
- Explore the subject to start as a researcher

UNIT –I
Motivation, importance, Data types for Data Mining: Relation Databases, Data Warehouses, Transactional databases, Advanced Database System and its applications, Data mining functionalities: Concept/Class description, Association Analysis, Classification & Prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis, Classification of Data Mining Systems, Major Issues in Data Mining.

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MCA312	DEC	Data Mining and Warehousing	3	0	0	3	60	20	20	0	0

UNIT –II

Data Warehouse and OLAP Technology for Data Mining: Differences between Operational Database Systems and Data Warehouse, a multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Servers, Implementation of Data Warehouse, Data Cube Technology.

UNIT-III

Data Pre-processing: Problems with real world data, data pre-processing as a process, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation. Data Mining Primitives, Languages and System Architectures, Concept Description: Characterization and Comparison, Analytical Characterization.

UNIT –IV

Mining Association Rules in Large Databases: Association Rule Mining: Market Basket Analysis, Basic Concepts, Mining Single-Dimensional Boolean Association Rules from Transactional Databases: different algorithms, the Apriori, Partition, Dynamic Itemset Counting, pincer search, FP tree Growth, Generating Association rules from Frequent items, Improving the efficiency of Apriory, Mining Multilevel Association Rules, Multidimensional Association Rules, Constraint-Based Association Mining.

UNIT –V

Classification, Prediction and Cluster Analysis: Issues regarding classification and prediction, Different Classification and Clustering Methods, Cluster Analysis, Applications and Trends in Data Mining: Data Mining Applications, currently available tools.

Text Books:
1. J. Han and M. Kamber, 'Data Mining: Concepts and Techniques', Morgan Kaufmann Pub.
2. Berson, 'Data Warehousing, Data Mining and OLAP', TMH.
3. W.H. Inmon, 'Building the Data Warehouse', Wiley India.
4. Anahory, 'Data Warehousing in Real World', Pearson Education.
5. Adriaans, 'Data Mining', Pearson Education.
6. A.K. Pujari, 'Data Mining Techniques', University Press, Hyderabad.

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							TEACHING & EVALUATION SCHEME				
MCA322	DEC	Cryptography and Information Security	3	0	0	3	60	20	20	0	0

Legends: L – Lecture; T – Tutorial/Teacher Guided Student Activity; P – Practical; Q/A – Quiz/Assignment/Attendance; MST – Mid Semester Test.

*Teacher Assessment shall be based on following components: Quiz/Assignment/Project/Participation in class activities, given that no component shall exceed more than 10 marks

Course Education Objectives (CEOs):

- To learn about different Cryptography Encryption and Decryption Technique.
- To understand the concepts of various asymmetric and symmetric algorithms.
- To understand the different aspects of Information Security and other security areas.

Course Outcomes (COs): Upon completion of the subject, students will be able to:

- Explain concepts of cryptography and ciphers.
- Describe advance encryption techniques and algorithms.
- Understand the key exchange protocols.
- Define information systems and its related security aspects.
- Explore different types of security including network, computer, internet security.

Unit-I

Cryptography: Concepts & Techniques: Introduction, Plaintext & Cipher text, Creaser Cipher, Substitution Techniques, Substitution Boxes (SBoxes), Permutation Cipher, Transposition Techniques, Encryption & Decryption, Symmetric and Asymmetric key Cryptography, Key Range & Key Size.

Unit-II

Symmetric Key Algorithm: Introduction of Block Ciphers, Overview of Symmetric Key Cryptography, DES (Data Encryption Standard) algorithm, Double DES Triple DES, AES, IDEA (International Data Encryption Algorithm) algorithm.

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
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MCA322	DEC	Cryptography and Information Security	3	0	0	3	60	20	20	0	0

Unit-III

Asymmetric Key Algorithm: Overview of Asymmetric key Cryptography, RSA algorithm, Symmetric & Asymmetric key Cryptography together, Diffie-Hellman Key Exchange, Digital Signature, Basic concepts of Message Digest and Hash Function. Man in Middle Attack, DoS and DDoS Attacks.

Unit-IV

Information Security: Introduction of Information System, Functions and Types of Information System, Information System Threats and Attacks Defined, Security Services, Information System Security and control, Cyber Crime and Information Security

Unit-V

Other Security: Threats in Network, Network Security, Attacks on Computer, Computer Security, Network Access Control and Cloud Security, Transport- Level Security, Wireless Network Security, Electronic Mail Security, IP Security.

Text Books:

1. William Stallings, "Cryptography and Network Security: Principles and Practice", Sixth Edition, Pearson Education, 2013.
2. C. Kaufman, R. Perlman and M. Speciner, "Network Security: Private Communication in a Public World", Second Edition, Pearson, 2016.
3. AtulKahate, "Cryptography & Network Security", Third Edition, McGraw Hill Education, 2017.
4. Gaurav Gupta, Sarika Gupta "Information Security and Cyber Laws", First Edition, Khanna Publishing, 2019

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCA322	DEC	Cryptography and Information Security	3	0	0	3	60	20	20	0	0

References:

1. Wenbo Mao, "Modern Cryptography: Theory and Practice", First Edition, Prentice Hall, 2003.
2. William Stallings, "Network Security Essentials: Applications and Standards", Sixth Edition, Pearson Education, 2018.
3. Douglas R. Stinson, M. Paterson, "Cryptography: Theory and Practice", Fourth Edition, CRC Press, 2018.
4. Elizabeth D. Zwicky, Simon Cooper, D. Brent Chapman, "Building Internet Firewalls", Second Edition, O'Reilly, 2000.
5. http://nptel.ac.in/

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MCA332	DEC	Big Data Analytics	3	0	0	3	60	20	20	0	0

Legends: L – Lecture; T – Tutorial/Teacher Guided Student Activity; P – Practical; Q/A – Quiz/Assignment/Attendance; MST – Mid Semester Test.

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Course Education Objectives (CEOs): The objective of this course is to teach students about:
1. To familiarize the students with the need and scope of the subject.
2. Provide an exposure giving a strong foundation to the data analytics practices.
3. Big data computing technologies, Watson studio
4. Understand the challenges posed by distributed applications and how ZooKeeper is designed to Handle.
5. create a basis for the use of advanced investigative and computational methods to convert information to useful knowledge.
6. Develop an understanding of how business analytics is actually performed
7. Develop an understanding of the complete open-source Hadoop ecosystem and its near term future direction
8. Covers foundational techniques and tools required for data science and big data analytics like Hadoop, NoSQLMapReduce, BIGSQL, Watson studio.

Course Outcomes (COs): After the completion of the course the student will be able to:

1. understanding importance and scope of the subject
2. understand the technological foundations of the Big Data
3. differentiate the structured and unstructured data and different databases to store structured and unstructured data like Mongo DB, HBase etc.
4. store and manipulate the different types of data
5. have a knowledge of HADOOP andHadoop ecosystem and its uses in Big Data
6. understand and apply the Big Data Analytics.
7. Understand the functions and features of HDP.

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MCA332	DEC	Big Data Analytics	3	0	0	3	60	20	20	0	0

Syllabus

Unit I

Big Data: Introduction and basics, Evolution of Data Management, Definition, Importance, Big Data Types, Structured and unstructured Data, Sources of bigstructured data and unstructured data, Architecture of Big Data Management System, Stages of Big Data Management,

Big Data Technology Foundations: Technology Components, virtualization, distributed computing, Cloud and Big Data, Integration of data types into a big data environment.

Unit II

Big Data and operational Databases: relational, non relational, key-value pair, document, column oriented, graph, spatial databases, MapReduce, Hadoop, Hadoop Foundation and Ecosystem, Appliances and Big Data Warehouse, Big data Implementation, Big Data Applications. roles in building a complete big data, solution to common business problems.

Hadoop and HDFS: need for a big data strategy in terms of parallel reading of large data files and internode network speed in a cluster, Hadoop Distributed File System (HDFS), function of the NameNode and DataNodes in a Hadoop cluster, files are stored and blocks ("splits") are replicated. Hive, Sqoop.

Unit III

Big Data Analytics: Introduction, Basic and Advanced Analytics, Drivers, Pillars of Analytics: descriptive, predictive and prescriptive. Core Components of analytical data architecture, Performance issues, Parallel vs. distributed processing, Shared nothing data architecture and Massive parallel processing, Elastic scalability, Data loading patterns.

Data Analytics lifecycle: Discovery, Data Preparation, Model Planning, Model Building, Communicating results and findings.

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Unit IV

Apache Ambari: The purpose of Apache Ambari in the HDP stack, architecture of Ambari and Ambari' relation to other services and components of a Hadoop cluster, components of Ambari and their functions, initiating start and stop services from Ambari Web Console.

Introduction of Hortonworks Data Platform – HDP: functions and features of HDP, the IBM value-add components, basics of IBM Watson Studio, description of the purpose of the value-add components

Unit V

MapReduce and YARN: MapReduce model v1, the limitations of Hadoop 1 and MapReduce, handling the Mapper class with Java, Reducer class and the program driver needed to access MapReduce, the YARN model, Hadoop 2/YARN versus Hadoop 1

ZooKeeper, Slider, and Knox: The challenges with distributed applications and how ZooKeeper is designed to handle them, ZooKeeper: role within the Apache Hadoop infrastructure, the realm of Big Data management, real-world applications, services to manage distributed systems, ZooKeeper CLI and ZooKeeper services.

TEXT BOOKS:
1. "Introduction to InfosphereBigInsights", IBM Career Education
2. "Changing Business with Data Insight", IBM Career Education
3. "Big Insights Analytics for Business Analysts", IBM Career Education
4. "Hadoop: The Definitive Guide Paperback – 2015" by Tom White, Shroff Publishers & Distributers Private Limited - Mumbai; Fourth edition (2015).
5. "Big Data and Hadoop" by V. K. Jain, Khanna Publishers; 1 edition (1 June 2015)
6. "Big Data for Dummies" by Judith Hurwitz, Alan Nugent, Dr. Fern Halper and Marcia Kaufman Wiley, ISBN: 978-1- 118-50422-2, 2013
7. "Data Analytics, Models, Algorithms for Intelligent Data Analysis by Thomas A., Springer Vieweg , ISBN 978-3-8348-2589-6, 2013

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MCA332	DEC	Big Data Analytics	3	0	0	3	60	20	20	0	0

REFERENCE BOOKS:

1. "Big Data: A Revolution That Will Transform How We Live, Work, and Think" by Kenneth Cukier, Viktor Mayer-Schönberger; Mariner Books; Edition (2014)
2. "Big Data: Using Smart Big Data, Analytics and Metrics to Make Better" by Bernard Marr; Wiley; Edition 1st (2015)
3. "Mining of Massive Datasets, Chapter 2", by Ullman, Rajaraman,
4. "MapReduce and Parallel DBMS" by Stonebrakeret al.,: Friends or Foes?, Communications of the ACM, January 2010.
5. "MapReduce: A Flexible Data Processing Tool" by Dean and Ghemawat, Communications of the ACM, January 2010.

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCA305	SEC	Python Programming	3	0	2	4	60	20	20	30	20

Legends: L – Lecture; T – Tutorial/Teacher Guided Student Activity; P – Practical; Q/A – Quiz/Assignment/Attendance; MST – Mid Semester Test.

*Teacher Assessment shall be based on following components: Quiz/Assignment/Project/Participation in class activities, given that no component shall exceed more than 10 marks.

Course Education Objectives (CEOs):

The goal of this course is to provide students with an understanding of basic concepts of Python Programming Language along with its features and application areas, cloud management and cloud security.

Course Outcomes (COs): After completion of this syllabus students will be able to

- Apply the principles python programming.
- Write clear and effective python code.
- Create applications using python programming.
- Implementing database using SQL.
- Access database using python programming.

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MCA305	SEC	Python Programming	3	0	2	4	60	20	20	30	20

Unit-I

Introduction To Python: Basic Concept, characteristics, Features, various flavours of python, limitations of python, versions of python, Python-2 and Python-3 differences, python installation on windows, Identifiers, keywords, data types, type casting, use of comments in python, variables and constants, various operators used in python.

Unit-II

Input-output, Conditional, Iterative and TransferStatements: Basic simple programs using input and output statements.Decision Making statements: if statement, if-else statement and nested if statement.Iterative statements: For Loop, While loop, nested loops.Transfer statement: break, continue and pass statement.

Unit-III

Python Strings, List, Tuplesand Functions: Definition, accessingcharacters or values of a String, Updating Strings, String Special Operators, String Formatting Operator, Triple Quotes, Python Lists, python Tuples, list Vs tuples, python functions, python dictionary.

Unit-IV

Python File Handling: types of files, opening and closing a file with various modes, deleting a file.

Python exceptions and Assertions: exception handling, Exception Handling Vs Assertions:

Python OOPs Concepts: Introduction of Class and Object, creating class and its instance, constructor (Parameterized Constructor and Non-Parameterized Constructor), destructors, polymorphism, inheritance (Multilevel and multiple), data abstraction.

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MCA305	SEC	Python Programming	3	0	2	4	60	20	20	30	20

Unit-V

Using Databases in Python: Python MySQL Database Connectivity. Create database, create table, insert data into table, inserting multiple records into table, extracting data from the table, updating table record and delete table data.

Introduction to Real-world Applications of Python: Artificial Intelligence and Machine Learning, Scientific and Numeric Applications, Desktop GUI, Enterprise-level/Business Applications, Image Processing and Graphic Design Applications, Web Development, software development, Language development, game development etc.

Text Books:

1. Pratiyush Guleria," Basics of Python Programming, BPB Publications, March 2020.
2. Jason Cannon" Python programming for beginners, Kindle book, 2020
3. Paul Deitel and Harvey Deitel, "Python for Programmers with Big Data and Artificial Intelligence Case Studies" Deitel Developer Series, April 2019.
4. Ryan Turner, "Python Programming: 3 Books in 1: Ultimate Beginner's, Intermediate & Advanced Guide to Learn Python Step-by-Step", Kindle Edition, 2018.
5. Martin Brown, "Python: The Complete Reference", Mc-Graw-Hill, 2018.

List of Practical:

1. Write python program to print Hello World.

2. Write a program to perform different Arithmetic Operations on numbers in Python.

3. Write python program to Hello World using string variable.

4. Write python program to show use of conditional statement.

5. Write a python program to find largest of three numbers.

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							THEORY			PRACTICAL	
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MCA305	SEC	Python Programming	3	0	2	4	60	20	20	30	20

6. Write a Python program to convert temperatures to and from Celsius, Fahrenheit.

[Formula : c = (f-32)/1.8]

7.Write python program to store data in list and then try to print them.

8.Write python program to print list of numbers using for loop.

9. Write a python program to find factorial of a number using loop.

10.Write python program to store strings in list and then print them.

11.Write a program to create, append, and remove lists in python.

12. Write a program to demonstrate working with tuples in python.

13.Write a program to demonstrate working with dictionaries in python.

14.Write python program to let user enter some data in string and then verify data and print welcome to user.

15. Write python program in which a function is defined and calling that function prints Hello World.

16. Write python program in which a function(with single string parameter) is defined and calling that function prints the string parameters given to function.

17. Write python program in which a class is define, then create object of that class and call simple print function define in class.

| COURSE CODE | CATEGORY | COURSE NAME | L | T | P | CREDITS | THEORY | | | PRACTICAL | |
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCA305	SEC	Python Programming	3	0	4	5	3	0	2	4	60

18. Write a python program to define a module to find Fibonacci Numbers and import the module to another program.

19. Write a python program to define a module and import a specific function in that module to another program.

20. Write a script named copyfile.py. This script should prompt the user for the names of two text files. The contents of the first file should be input and written to the second file.

21. Write a program that inputs a text file. The program should print all of the unique words in the file in alphabetical order.

MBAI301C ADVANCEDHUMAN VALUES AND PROFESSIONAL ETHICS

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME							
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MBAI301C	AECC	Advanced Human Values and Professional Ethics	60	20	20	-	-	3	-	-	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical: C - Credit; AECC- Ability Enhancement Compulsory Course

*Teacher Assessment shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective

The objective of the course is to disseminate the theory and practice of moral code of conduct and familiarize the students with the concepts of "right" and "good" in individual, social and professional context

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes

1. Help the students to understand right conduct in life.
2. To equip students with understanding of the ethical philosophies, principles, models that directly and indirectly affect personal and professional life.

COURSE CONTENT

Unit I: Inculcating Values at Workplace

1. Values: Concept, Sources, Essence
2. Classification of Values.
3. Values in Indian Culture and Management: Four False Views, Value Tree
4. Eastern and Western Values; Values for Global Managers

MBA-INTERNATIONAL BUSINESS - III SEMESTER (2022-2024)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MBAI301C	AECC	Advanced Human Values and Professional Ethics	60	20	20	-	-	3	-	-	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; **P** – Practical: **C** - Credit; **AECC**- Ability Enhancement Compulsory Course

*Teacher Assessment shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Unit II: Professional Ethics
1. Ethics: Concept, Five P's of Ethical Power, Organisational Tools to Cultivate Ethics
2. Theories of Ethics: Teleological and Deontological
3. Benefits of Managing Ethics in an Organisation
4. Ethical Leadership

Unit III: Indian Ethos and Management Style
1. Indian Ethos and Workplace
2. Emerging Managerial Practices
3. Ethical Considerations in Decision Making and Indian Management Model
4. Core Strategies in Indian Wisdom and Ethical Constraints

Unit IV: Human Behavior – Indian Thoughts
1. Guna Theory
2. Sanskara Theory
3. Nishkama Karma
4. Yoga: Types, Gains; Stress and Yoga

Unit V: Spirituality and Corporate World
1. Spirituality: Concept, Paths to Spirituality
2. Instruments to achieve spirituality
3. Vedantic Approach to Spiritual and Ethical Development
4. Indian Spiritual Tradition.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	CREDITS
MBAI301C	AECC	Advanced Human Values and Professional Ethics	60	20	20	-	-	3	-	-	3

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Suggested Readings
1. Kausahl, Shyam L. (2006). *Business Ethics – Concepts, Crisis and Solutions*. New Delhi: Deep and Deep Publications Pvt. Limited
2. Murthy, C.S.V. (2012). *Business Ethics –Text and Cases.* Himalaya Publishing House: Mumbai
3. Chakraborty, S. K. (1999). *Values and Ethics for Organizations*. Oxford university press
4. D.Senthil Kumar and A. Senthil Rajan (2008). *Business Ethics and Values.* Himalaya Publishing House: Mumbai

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