AY (2024-2025)

Bachelor of Computer Applications

BCA Programme

Scheme of Instruction and Syllabi for BCA Semesters V & VI Effective from 2024-2025



Faculty of Informatics Osmania University 2024-2025

Dr. L.K. Suresh Kumar Chairperson Board of Studies (Informatics) Osmania University, Hyd-007

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SCHEME OF INSTRUCTION BCA (BACHELOR OF COMPUTER APPLICATIONS) BCA schema with effect from the academic year 2024-2025

SEMESTER V

S. No	Course Code	Course Title	Category	Contact Hour/week		No. of Credits	Scheme of Exam Duration(hrs)		Scheme of Examination (Max Marks)		
THEORY			L	Т	P		SEE	CIE	SEE	CIE	
1	BCA501	Programming using ASP. NET	ETC	4	0	0	4	3	1	70	30
2	BCA502	Unix Programming	ETC	4	0	0	4	3	1	70	30
3	BCA503	Object Oriented Systems Development	ETC	4	0	0	4	3	1	70	30
4	BCA504	Software Quality Testing	ETC	4	0	0	4	3	1	70	30
5.	BCA#	Elective I BCA 510 Mobile Application Development BCA511 Internet Protocols BCA 512 Data Mining	PEC	4	0	0	4	3	1	70	30
PRACTICALS											
6	BCA550	OOSD Lab	LTC	0	0	4	2	3	1	50	25
7	BCA551	Unix Programming Lab	LPC	0	0	4	2	3	1	50	25
8.	BCA552	DOT NET Lab	LCC	0	0	4	2	3	1	50	25
			TOTAL	20	0	12	26			500	225

Abbreviation	Full Form	Abbreviation	Full Form
BSC	Basic Science Course	LTC	Laboratory Technological Course
PCC	Professional Core Course	LPC	Laboratory Professional Course
ETC	Emerging Technological Course	LHC	Laboratory Humanities Course
HSC	Humanities and Social Science	CIE	Continuous Internal Evaluation
	Course		
MGC	Management Course	SEE	Semester End Evaluation
PEC	Professional Elective Course	L	Lecture
LCC	Laboratory Core Course	Р	Practical

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AY (2024-2025)

With effect from the academic year 2024-2025

BCA 501

PROGRAMMING USING ASP DOT NET Credits: 4

Instruction: (4L) hrs per week CIE: 30 marks Duration of SEE: 3 hours SEE: 70 marks

UNIT-I

Asp.Net Overview- Introduction to ASP.Net, Introduction to web Applications with web servers, web server role-IIS,APACHE etc, Web-browsers, web support languages, understanding ,http, TCP/IP role in web development.ASP.Net role:-ASP.Net framework, Name spaces ,New scenario in development process with IDE.

UNIT-II

ASP.Net web forms-Introduction to web forms, page directives and its use, separating code & design, new code behind techniques, ASP.Net server controls-Working with server controls, applying styles to controls, themes, skins etc.

UNIT-III

Web form validation controls-Required field validation Control Computer Validation Control, Custom Validation Control, Group Validation and Accounting Validation.ADO.Net Database Services-Overview of ADO.Net XML, XML to HTML, XML & Databases XML Support in .Net retrieve data with datasets & Data Adapters.

UNIT-IV

Presenting Data Using ASP.Net-Bound Controls- Data Source Controls, Repeater and its uses, Data list control, data grid control view and its importance, form view detail's view, list view. User controls-Adding member to user controls, registering user control ,properties & methods ,Dynamically loading user controls, master pages.

UNIT-V

ASP .Net Error Handling & Debug- Error handling & .Net returns, Structured Error handling, Catching General Exception, Catching Specific Exceptions, Throwing Exception Custom Exceptions ,Page level Error handling, Application level Error Handling. Configuring ASP.Net- Web machine Configuration, Global Assembly cache, working with Assembling information, Managing Application State, Http handlers, Applications & Server Events.

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Suggested Readings:

- 1. C#.NET Black Book by stevenholzner -dreamtech
- 2. ASP.NET Unleashed
- 3. C# programming wrox publication
- 4. C# programming Black Book by Matt telles

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BCA 502

UNIX PROGRAMMING

Credits: 4

Instruction: (4 l) hrs per week CIE: 30 marks

Duration of SEE: 3 hours SEE: 70 marks

UNIT-I

Unix: Introduction, commands, file system, security and file permission, regular expression and grep, shell programming, awk

UNIT-II

The Unix Model, signal, process control, daemon process. Inter process Communication: Introduction, file and record locking, other Unix locking techniques, pipes, FIFOs, streams and messages, namespaces, message queues, semaphores and shared memory.

UNIT-III

Socket programming, Socket address, elementary socket system calls, advanced socket system calls, reserved ports, socked options, asynchronous I/O, Input/ Output Multiplexing, out-off band. data, sockets and signals, Internet super server.

UNIT-IV

Introduction to PHP: Overview, syntactic characteristics, primitives, operations and expressions, output, control statements, arrays, functions. pattern matching, form handling files, cookies and session tracking.

UNIT-V

Python Basics, Python Objects, Numbers, Sequences: Strings, Lists, and Tuples, Mapping and Set Types, Conditionals and Loops, Files and Input/ Output, Errors and Exceptions, Functions and Functional Programming, Modules, Object oriented programming.

Suggested Readings:

1. Behrouz A. Forouzan and Richard F. Gilberg, "Unix and Shell Programming: a Text book" Cengage learning, 2008.

2. W. Richard Stevens, "Unix Network Programming", Pearson Education, 2009.

3. Robert W. Sebesta, "Programming the World Wide Web", Pearson Education, 2008.

4. Wesley J. Chun, "Core Python Programming", Prentice Hall.

5. Sumitabha Das, "Unix concepts & Applications", Fourth Edition, Tata McGraw hill, 2006.

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OBJECT ORIENTED SYSTEMS DEVELOPMENT Credits:4

Instruction: (4L) hrs per week CIE: 30 marks

Duration of SEE: 3 hours SEE:70marks

UNIT-I

UML Introduction : Why we model, Introducing the UML, Hello World. Basic Structural Modeling Classes, Relationships, Common Mechanisms, Diagrams, Class Diagrams. Advanced Structural Modeling: Advanced Classes, Advanced Relationships, Relationships, Interfaces, Types and Roles, Packages, Instances, Object Diagrams, Components.

Unit-II

Basic Behavioral Modeling: Interactions, Use Cases, Use Case Diagrams, Interaction Diagrams, Activity Diagrams. Advanced Behavioral Modeling: Events and signals, State Machines, Processes and Threads, Times and space, State Chart Diagrams.

Unit-III

Architectural Modeling: Artifacts, Deployment Collaborations, Patterns and Frameworks, Artifact diagrams, Deployment diagrams, Systems and models.

Unit-IV

Unified Software Development Process: The Unified Process, The Four Ps, A Use- Case- Driven Process, An Architecture, An Architecture-Centric Process, An Iterative and incremental Process.

Unit-V

Core Workflows: Requirements Capture, Capturing Requirements as Use Cases, Analysis, Design, Implementation, Test.

Suggested Reading:

1. Grady Booch, James Rumbaugh, Ivor Jacbson, The Unified Modeling Language-User Guide, (Covering UML 2.0) 2nd Edition, Pearson Education, India, 2007. 2. Ivor Jacbson, Grady Booch, James Rumbaugh, The Unified Software Development Process, Pearson Education, India, 2008.

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AY (2024-2025)

BCA504

SOFTWARE QUALITY TESTING

Credits: 4

Instruction: (3L) hrs per week CIE: 30 marks

Duration of SEE: 3 hours SEE: 70 marks

UNIT I

INTRODUCTION TO SOFTWARE QUALITY Ethical Basis for Software Quality – Total Quality Management Principles – Software Processes and Methodologies – Quality Standards, Practices & Conventions –Improving Quality with Methodologies – Structured/Information Engineering – Measuring Customer Satisfaction–Software Quality Engineering – Defining Quality.

UNIT II

SOFTWARE QUALITY METRICS AND RELIABILITY Writing Software Requirements and Design Specifications – Analyzing Software Documents using Inspections and Walkthroughs – Software Metrics – Lines of Code, Cyclamate Complexity, Function Points, Feature Points – Software Cost Estimation.

UNIT III

TEST CASE DESIGN Testing as an Engineering Activity – Testing Fundamentals – Defects – Strategies and Methods for Black Box Test Case Design – Strategies and Methods for White-Box Test Case Design – Test Adequacy Criteria – Evaluating Test Adequacy Criteria – Levels of Testing and different Types of Testing.

UNIT IV

TEST MANAGEMENT Testing and Debugging Goals and Policies – Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – Reporting Test Results – The Role of Three Groups in Test Planning and Policy Development – Process and the Engineering.

UNIT V

CONTROLLING AND MONITORING Measurement and Milestones for Controlling and Monitoring – Status Meetings – Reports and Control Issues – Criteria for Test Completion – SCM – Types of Reviews – Developing a Review Program – Components of Review Plans – Reporting Review Results.

Suggested Readings:

1. Ilene Burnstein, Practical Software Testing, Springer International Edition, 2003.

2. Stephen Kan, Metrics and Models in Software Quality, Addison-Wesley, Second Edition, 2004.

3. Milind Limaye, Software Quality Assurance, McGraw Hill, 2011.

4. M G Limaye, Software Testing - Principles, Techniques and Tools, McGraw Hill, 2011

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MOBILE APPLICATION DEVELOPMENT Credits: 4

Instruction: (4L) hrs per week CIE: 30 marks

Duration of SEE: 3 hours SEE: 70 marks

UNIT-I

Applications, history of mobile communications, reference model Wireless transmission - Frequencies, Signals, Antennas, Signal propagation, Multiplexing Modulation, Spread spectrum, cellular systems Medium access layer - Motivation, SOMA, FDMA, COMA Wireless LAN - Infrared vs radio transmission, infrastructure, IEEE802.11. HIPERLAN, Bluetooth

UNIT-II

Key services for mobile internet. Mobile IP - Goals, assumptions, requirements, entities, IP packet delivery. Agent advertisement and discovery, Registration. Tunneling. Optimization, reverse tunneling, DHCP, Adhoc networks, Mobile transport Layer - Traditional TCP, Indirect TCP . Snooping TCP, Mobile TCP, Fast transmit Fast recovery, Transmission timeout freezing, transaction oriented TCP

UNIT-III

Wireless Application Protocol - Overview of WAR WAP architecture, components. Network infrastructure Design principles WML - Document model, Basics, basic content, events, tasks and binding, variables, other content, controls, application security, other data

UNIT-IV

Wireless binary extensible markup language WML Script - language basics, standard libraries, script libraries, script development User interface design - structured usability methods, design guidelines - user interface, selected WML elements

UNIT-V

Tailoring content to client Push messaging Wireless telephony applications Building and deploying End-to-End WAP services

Suggested Reading

- 1. Sundeep Singh etc. Wireless Application Protocal Addison Wesley 2001
- 2. Jochen Schiller Mobile communications, Addison-Wesley 2001

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INTERNET PROTOCOLS

Credits 4

Instruction: (4L) hrs per week CIE: 30 marks Duration of SEE: 3 hours SEE: 70 marks

<u>UNIT-I</u>

Protocols and Standards: Protocols, Standards, TCP/IP- Protocol Suite, Addressing. **IP Addressing -** Decimal Notation, Classes, Special Addresses, Unicast- Multicast and Broadcast Addresses. **Sub Netting and Super Netting** – Sub Netting, Masking, Super Netting.

Delivery and Routing of IP Packets - Connection Oriented Versus Connectionless Services, Direct Versus Indirect Delivery, Routing Methods, Static Versus Dynamic Routing.

UNIT-II

Internet Protocol - Datagram, Fragmentation, Options, Checksum. **ARP and RARP** –ARP, Packet Format, Encapsulation, Operation, Proxy ARP, RARP Packet Format. **Internet Control Message Protocol (ICMP)** - Types of Messages, Message Format, Error

Reporting, Query. Internet Group Management Protocol (IGMP)

UNIT-III

Routing Protocols: OSPF- Areas, Metric, Link State Routing, Types of Links. BGP-Path Vector Routing-Path Vector Messages.

Next Generation Ipv6:Ipv6, Addresses, Packet Format, Comparison between Ipv4 and Ipv6 Headers

UNIT-IV

Transmission Control Protocol (TCP) - Process To Process Communication, Services, Segment, Options, Checksum, Flow Control, Error Control, Timers, Connection, User Datagram Protocol

<u>UNIT-V</u>

Telnet- Concepts, NVT, Options, Escape Character, Mode of Operation, User Interface, Rlogin. File Transfer Protocol (FTP)-Connections, Communication, Command Processing, File Transfer. Simple Mail Transfer Protocol (SMTP) - User Agent, Addresses, Delayed Delivery, Aliases, MTA, Commands and Responses, Mail Transfer Phases, Mime, Pop. Domain Name System (DNS) - Name Space, Domain Name Space, Distribution, DNS in Internet

Suggested Readings:

- 1. Behrouz A. Forouzan TCP/IP Protocol suite, McGraw 2000.
- 2. Douglas E .Comer, TCP/IP Protocol suite, 2004, Prentice Hall India Publications.
- 3. Libor Dostalele, TCP/IP Protocol suite, 2006, Pearson New International Edition.

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AY (2024-2025)

BCA 512

DATA MINING

Credits 4

Instruction: (4L) hrs per week CIE: 30 marks Duration of SEE: 3 hours SEE: 70 marks

UNIT I

INTRODUCTION : Introduction to Data Mining – Kind of Data – Functionalities – Interesting Patterns – Task Primitives – Issues In Data Mining - Data Preprocessing: Why Preprocessing

UNIT II

ASSOCIATION RULES: Mining Frequent Patterns: Associations And Correlations - Basic Concepts – Frequent Item Set Mining Methods – Mining Various Kinds Of Association Rules

UNIT III

CLASSIFICATION AND PREDICTION: Issues Regarding Classification and Prediction – Decision Tree Induction Classification – Bayesian, Rule Based Classification – Support Vector Machine

UNIT IV

CLUSTER ANALYSIS- What Is Cluster Analysis, Types Of Data In Cluster Analysis – A Categorization Of Major Clustering Methods – Hierarchical Methods

UNIT V

APPLICATIONS AND TRENDS IN DATA MINING: Applications and Trends in Data Mining: Data Mining Applications – Products And Research Prototypes – Additional Themes on Data Mining – Social Impacts of Data Mining

Suggested Readings:

- 1. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Second Edition, Morgan Kaufmann Publishers, 2006.
- 2. M. H. Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education. 2001.
- 3. D. Hand, H. Mannila and P. Smyth, "Principles of Data Mining", PrenticeHall. 2001.

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BCA 550

OBJECT ORIENTED SYSTEMS DEVELOPMENT LAB

1

Credits: 2

Instruction: (4 P) hrs per week CIE: 25 marks Duration of SEE: 3 hours SEE: 50 marks

Students have to perform the following OOSD steps for the given List of Programs:

Select one Information System/Approach and device the following using UML tool:

- 1. Structured Diagrams (Data Flow Diagrams, Entity-Relationship Diagrams etc..)
- 2. Preparation of Software Requirement Specification Document for a given Case Study.

UML Diagrams

- 1. Use Case Diagrams
- 2. Class Diagrams
- 3. Object Diagrams
- 4. Sequence Diagrams
- 5. Collaboration Diagrams
- 6. Activity Diagrams
- 7. State Chart Diagrams
- 8. Component Diagrams
- 9. Deployment Diagrams

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BCA 551

UNIX PROGRAMMING LAB

Credits: 2

Instruction: (4 P) hrs per week CIE: 25 marks Duration of SEE: 3 hours SEE: 50 marks

- 1. Examples using Shell scripts.
- 2. Programming using IPC.
- 3. Socket programs.
- 4. PHP Programs using form handling using cookies.
- 5. Develop Python programs for the following: (Prerequisite)
 - a) Demonstrate user-defined functions
 - b) Demonstrate Control Structures
 - c) Demonstrate Caching a Template Fragment
 - d) Programs based on object oriented design.
- 6. Examples using IPC
- 7. Echo Server using TCP (Concurrent or Iterative) and UDP
- 8. Time of the day server
- 9. Talker and Listener
- 10. Ping routine
- 11. Trace route
- 12. Mini DNS

Note: The above experiments [7-12] have to be carried out using socket programming interface. Multi- threading has to be employed wherever it is required.

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BCA 55

DOT NET LAB Credits: 2

Instruction: (4 P) hrs per week CIE: 25 marks Duration of SEE: 3 hours SEE: 50 marks

- 1. Installing .Net Framework
- 2. Installing Visual Studio 2013
- 3. Hello world in Visual Studio
- 4. GUI form Design for student attendance
- 5. GUI form design Form Controls
- 6. For loops Execution for drop Down List
- 7. whie loop execution for pop up menu
- 8. Ado.Net Connecting to Data Source
- 9. ADO.Net connectivity for Accessing MSSQL Table for select and Create
- 10. Ado.Net for Insert and Update using Grid
- 11. Asp.net for student marks using HTML along with Form Cotrols
- 12. Asp.Net displaying Student details with ADO.NET and AJAX Controls

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SCHEME OF INSTRUCTION BCA (BACHELOR OF COMPUTER APPLICATIONS) Proposed scheme with effect from the academic year 2024-2025

SEMESTER - VI

S.No	Course Code	Course Title	Category	Contact Hour/week			Credits	Scheme of Exam Duration(hrs)		Scheme of Examination (Max Marks)	
Theory			L	T	P	SEE		CIE	SEE	CIE	
1	BCA601	Information Security	ETC	4	0	0	4	3	1	70	30
2	BCA602	Advanced JAVA Programming	ETC	4	0	0	4	3	1	70	30
3	BCA	Elective-II BCA 603 Big Data Analytics BCA 604 IOT AND ITS APPLICATIONS BCA 605 Machine Learning	PEC	4	0	0	4	3	1	70	30
k nin St			PRACT	TICA	LS						
4	BCA651	Advanced Java Programming-Lab	LTC	0	0	4	2	3	1	50	25
6	BCA652	Project work	PC	0	0	14	7	100	4	100	50
			TOTAL	16	0	16	21			360	165

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BCA 601

INFORMATION SECURITY

Credits: 4

Instruction: (4L) hrs per week CIE: 30 marks Duration of SEE: 3 hours SEE: 70 marks

UNIT-I

Introduction: History, Critical characteristics of information, NSTISSC security model, Components of an information system, Securing the components, Balancing security and access, The SDLC, The security SDLC. Need for Security: Business needs, Threats, Attacks- secure software development. **UNIT-II**

Legal, Ethical and professional Issues: Law and ethics in information security, Relevant U.S laws international laws and legal bodies, Ethics and information security.

Risk Management: Overview, Risk identification, Risk assessment, Risk control strategies, selecting a risk control strategy, Quantities versus qualitative risk control practices, Risk management discussion points, Recommended risk control practices.

UNIT-III

Planning for Security: Security policy, Standards and practices, Security blue print, Security education, Continuity strategies. Security Technology Firewalls and VPNs: Physicaldesign, Firewalls, Protecting remote connections

UNIT-IV

Security Technology: Intrusion detection, access control and other security tolls: Intrusion detection and prevention systems, Scanning and analysis tools, Access control devices.

Cryptography: Foundations of cryptology, Cipher methods, Cryptographic Algorithms,

Cryptographic tools, Protocols for secure communications, Attacks on cryptosystems.

UNIT- V

Implementing Information Security: Information security project management, Technical topics of implementation, Non technical aspects of implementation, Security certification and accreditation. Security and Personnel: Positioning and staffing security function, Employment policies and practices, Internal control strategies. Information security maintenance : Security management models, The maintenance model, Digital forensics

Suggested Reading:

1. Michel E With man and Herbert J Mattord, Principles and Practices of Information Security, Cengage Learning, 2009.

2. Thomas R Peltier, Justin Peltier, John Blackley, Information Security Fundamentals, Auerbach Publications, 2010.

3. Detmar W Straub, Seymour Goodman, Richard L Baskerville, Information Security, Policy, Processes and Practices, PHI, 2008.

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BCA 602

ADVANCED JAVA PROGRAMMING Credits: 4

Instruction: (4L) hrs per week CIE: 30 marks Duration of SEE: 3 hours SEE: 70 marks

Unit-1

Introducing JDBC: Describing Components of JDBC, Features of JDBC, JDBC Architecture: Types of Divers, Advantages and disadvantages of Drivers, Use of Drivers, JDBC Statement and Methods: Statement, Prepared Statement, Callable Statement, Working with Result set interface, Working with Result set with metadata

Unit-2

Introducing CGI, Introducing Servlet, Advantages of Servlet over CGI, Features of Servlet, Introducing Servlet API:Javax.servlet package, Javax.servlet.http package, Servlet life, Working with GenericServlet and Http Servlet, Request Dispatcher interface, Use of Request Dispatcher, Session in Servlet: Introducing session, Session tracking mechanism, Cookies: Advantages & disadvantages, use of cookies, Hidden form filed, URL rewritten, Http Session.

Unit-3

Introduction to JSP :Advantages of JSP over Servlet, JSP architecture, JSP life cycle, Implicit objects in JSP, JSP tag elements- Declarative, Declaration, scriplet, expression, action. Java Bean- Advantages & Disadvantages, useBean tag- setProperty and getProperty, Bean In Jsp

Unit-4

JSTL core tag: General purpose tag, conditional tag, networking tag ,JSTL SQL tags , JSTL formatting tags , JSTL xml tags ,Custom tag: empty tag, body content tag, iteration tag, simple tag , Introducing internationalization & Java: local class, Recourse Bundle class, web application

Unit – V

Working with JSF, Java Server Faces, Web Design Patterns, Security in web Application, Introduction to Frameworks in java: struts, springs, hibernate.

Suggested Reading:

1. JDBC, Servlets and JSP Black Book, Dreamtech Publication, Santhosh Kumar.k

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BCA 693

BIG DATA ANALYTICS Credits: 4

Instruction: (4L) hrs per week CIE: 30 marks

Duration of SEE: 3 hours SEE: 70 marks

Unit- I

Introduction: What Is Big Data and Why Is It Important? A Flood of Mythic "Start-Up" Proportions, Big Data Is More Than Merely Big Why Now? A Convergence of Key Trends, Relatively Speaking , A Wider Variety of Data, The Expanding Universe of Unstructured Data.

Unit-II

Big Data Technology: The Elephant in the Room: Hadoop's Parallel World. Old vs. New Approaches, Data Discovery: Work the Way People's Minds Work, Open-Source Technology for Big Data Analytics, The Cloud and Big Data, Predictive Analytics Moves into the Limelight.

Unit-III

A Brief History of Hadoop, Apache Hadoop and the Hadoop Ecosystem. MapReduce: Analyzing the Data with Hadoop, Map and Reduce, Java MapReduce, Scaling Out, Data Flow, Combiner Functions, Running a Distributed Map Reduce Job, Hadoop Streaming, The Hadoop Distributed File system, The Design of HDFS, HDFS Concepts, Blocks, Name nodes and Data nodes

Unit-IV

HDFS Federation, HDFS High-Availability, The Command-Line Interface, Basic File system Operations, Hadoop Files stems. Information Management: The Big Data Foundation, Big Data Computing Platforms, Big Data Computation, More on Big Data Storage, Big Data Computational Limitations

Unit-V

Big Data Emerging Technologies, Business Analytics : The Last Mile in Data Analysis, Geospatial Intelligence Will Make Your Life Better, Consumption of Analytics, From Creation to Consumption, Data Privacy and Ethics : The Privacy Landscape, The Great Data Grab Isn't New, Preferences, Personalization, and Relationships, Rights and Responsibility

Suggested Readings:

1. Michael Minelli, Michele Chambers, Big Data, Big Analytics, Wiley Publications, 2013

2. Tom White, Hadoop: The Definitive Guide, 3/e, O'Reilly Publications. (MODULE-III)

3. Bill Franks, Taming The Big Data Tidal Wave, 1/e, Wiley, 2012. 2. Frank J. Ohlhorst, Big Data Analytics, 1/e, Wiley, 2012

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IOT AND ITS APPLICATIONS Credits: 4

Instruction: (4L) hrs per week SEE: 3 hours CIE: 30 marks Duration of

SEE: 70 marks

UNIT – I

IoT & Web Technology, The Internet of Things Today, Time for Convergence, Towards the IoT Universe, Internet of Things Vision, IoT Strategic Research and Innovation Directions, IoT Applications, Future Internet Technologies, Infrastructure, Networks and Communication, Processes, Data Management, Security, Privacy & Trust, Device Level Energy Issues, IoT Related Standardization, Recommendations on Research Topics.

UNIT - II

M2M to IoT – A Basic Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. M2M to IoT-An Architectural Overview– Building an architecture, Main designprinciples and needed capabilities, An IoT architecture outline, standards considerations.

Unit -III

IoT Architecture -State of the Art – Introduction, State of the art, Architecture. Reference Model-Introduction, Reference Model and architecture, IoT reference Model, IoT Reference Architecture-Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views.

UNIT - IV

IoT Applications for Value Creations Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management, eHealth.

UNIT - V

Internet of Things Privacy, Security and Governance Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security

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TEXT BOOK:

1. Vijay Madisetti and ArshdeepBahga, "Internet of Things: (A Hands-on Approach)", UniversitiesPress (INDIA) Private Limited 2014, 1st Edition.

REFERENCE BOOKS:

- 1. Michael Miller, "The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and SmartCities Are Changing the World", Pearson Education 2015.
 - 2. Francis da Costa, "Rethinking the Internet of Things: A Scalable Approach to ConnectingEverything", Apress Publications 2013, 1st Edition.
- 3. Waltenegus Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice", Wiley 2014.

4. CunoPfister, "Getting Started with the Internet of Things", O"Reilly Media 2011.

WEB REFERENCES:

- https://github.com/connectIOT/iottoolkit
- > https://www.arduino.cc/
- <u>http://www.zettajs.org/</u>

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MACHINE LEARNING

Credits: 4

Instruction: (4L) hrs per week CIE: 30 marks Duration of SEE: 3 hours SEE: 70 marks

UNIT I:

BASICS Learning Problems Perspectives and Issues Concept Learning Version Spaces and Candidate eliminations – Inductive bias – Decision Tree learning – Representation – Algorithm –Heuristic Space Search

UNIT II:

NEURAL NETWORKS AND GENETIC ALGORITHMS: Neural Network Representation Problems Perceptions Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms Hypothesis Space Search– Genetic Programming – Models of Evolutions and Learning.

UNIT III:

BAYESIAN AND COMPUTATIONAL LEARNING: Bayes Theorem Concept Learning Maximum Likelihood Minimum Description Length Principal Bayes Optimal Classifier Gibbs Algorithm Naïve Bayes Classifier Bayesian Belief Network EM Algorithm Probability Learning Sample Complexity Finite and Infinite Hypothesis Spaces – Mistake Bound Model.

UNIT IV

INSTANT BASED LEARNING: K- Nearest Neighbor Learning Locally Weighted Regression RadialBases Functions – Case Based Learning.

UNIT V

ADVANCED LEARNING: Learning Sets of Rules Sequential Covering Algorithm Learning Rule Set First Order Rules Sets of First Order Rules Induction on Inverted Deduction Inverting Resolution Analytical Learning Perfect Domain Theories Explanation Base Learning – FOCL Algorithm – Reinforcement Learning Task Learning Temporal Difference Learning

TEXT BOOK:

- 1. Tom M. Mitchell, "Machine Learning", McGraw-Hill, 2010
- 2. Bishop, Christopher. *Neural Networks for Pattern Recognition*. New York, NY: Oxford UniversityPress, 1995

REFERENCES:

- 1. Ethem Alpaydin, (2004) "Introduction to Machine Learning (Adaptive Computation and Machine Learning)", The MIT Press
- 2. T. astie, R. Tibshirani, J. H. Friedman, "The Elements of Statistical Learning", Springer (2nd ed.), 2009

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ADVANCED JAVA PROGRAMMING LAB

Credits:2

Instruction: (4 P) hrs per week CIE: 25 marks Duration of SEE: 3 hours SEE:50marks

- 1. Jdbc Program to connect the Oracle Database
- 2. Create a new Database table using JDBC.
- 3. Jdbc program to insert the records into database.
- 4. Jdbc program to read the data from Database using ResultSet
- 5. Jdbc program to update the records into database
- 6. Jdbc program to delete the records into database
- 7. Jdbc program to demonstrate Prepared Statement
- 8. Jdbc program to demonstrate Prepared Statement
- 9. Instalation and configuring Apache Tomcat Server.
- 10. Instalation and configuring Netbeans, MyEcplice IDEs.
- 11. Servlet Program to demonstrate Life cycle methods using GenericServlet
- 12. Servlet Program to demonstrate RequestDispacher
- 13. Servlet Program to demonstrate Session Tracking
- 14. Servlet Program to demonstrate Cookies
- 15. Servlet Program to demonstrate Filters
- 16. JSP program to demonstrate JSP tag elements
- 17. JSP program to demonstrate implecit objects
- 18. JSP program to demonstrate useBean tag
- 19. JSP program to demonstrate JSTL
- 20. JSP program to Process the Form
- 21. Develop simple application to process the registration form using jsp and jdbc with the help of IDE.(Real time application development using MVC architecture)

Dr. L.K. Suresh Kumar Chairperson Board of Studies (Informatics) Osmania University, Hyd-007

Dean, Faculty of Informatics Osmania University

PROJECT WORK Credits 7

Instruction: (14P) hrs per week CIE: 50 Marks Duration of SEE: 3Hours SEE: 150 Marks

Sixth Semester of the MCA course is exclusively meant for project work. Project has to be carried out by each student individually in a period of 15 weeks of duration. Students should submit a synopsis at the end of 2^{nd} week in consultation with the Project Guide. The synopsis should consist of definition of the problem, scope of the problem and plan of action. After completion of eight weeks students are required to present a Project Seminar on the topic covering the aspects of analysis, design and implementation of the project work.

At the end of the semester the students are required to present themselves for a University Vive-voce examination.

A committee consisting of two faculty members of the respective college along with a guide will evaluate the project and award CIE marks.

Each student will be required to:

- 1. Submit one page of synopsis on the project work for display on notice board.
- 2. Give a 20 minutes presentation followed by 10 minutes discussion.
- 3. Submit a technical write-up on the project.

At least two teachers will be associated with the Project Seminar to evaluate students for the award of CIE marks which will be on the basis of performance in all the 3 items stated above.

The project seminar presentation should include the following components of the project:

- Problem definition and specification.
- Literature survey, familiarity with research journals.
- Broad knowledge of available techniques to solve a particular problem.
- Planning of the work, preparation of bar (activity) charts
- Presentation both oral and written.

Dr. L.K. Suresh Kumar Chairperson Board of Studies (Informatics) Osmania University, Hyd-007

Dean.

Faculty of Informatics Osmania University