SRI SIDDHARTHA ACADEMY OF HIGHER EDUCATION, TUMKUR

Sri Siddhartha Institute of Technology

Master of Computer Applications

SCHEME OF TEACHING AND EXAMINATION

(2022-23 onwards)

III SEMESTER

Sl.No.	Subject Code	Title	L - T - P - C	CIE	SEE	Total
1.	**22MCA301**	Mobile Applications	3 - 1 - 0 - 4	50	100	150
2.	**22MCA302**	Big Data and Analytics	3 - 1 - 0 - 4	50	100	150
3.	**22MCA303**	Internet of Things	3- 1 - 0 - 4	50	100	150
4.	**22MCA3PE4X**	Professional Elective-III	3 - 0 - 0 - 3	50	100	150
5.	**22MCA3PE5X**	Professional Elective-IV	3 - 0 - 0 - 3	50	100	150
6.	**22MCA3LB1**	Mobile Applications Lab	0 - 0 - 2 - 1	50	50	100
7.	**22MCA3LB2**	Big Data Lab	0 - 0 - 2 - 1	50	50	100
8.	**22MCA3MP1**	Mini Project Lab	0 - 0 - 4 - 2	50	50	100
Total			**Credits: 22**	**400**	**650**	**1050**

Elective-III		**Elective-IV**	
22MCA3PE41	Block Chain Technology	**22MCA3PE51**	Deep Learning
22MCA3PE42	Cloud Computing	**22MCA3PE52**	Pattern Recognition
22MCA3PE43	Natural Language Processing	**22MCA3PE53**	Object Oriented Programming in C#
22MCA3PE44	Software Testing	**22MCA3PE54**	Artificial Intelligence
22MCA3PE45	Web Services	**22MCA3PE55**	Ethical Hacking

SRI SIDDHARTHA ACADEMY OF HIGHER EDUCATION, TUMKUR
Sri Siddhartha Institute of Technology

Master of Computer Applications

SCHEME OF TEACHING AND EXAMINATION

(2022-23 onwards)

IV SEMESTER

Sl.No	Subject Code	TITLE	L - T - P - C	CIE	SEE		Total
					Dissertation	Viva	
1.	**22MCA4TS1**	Research/Technical Seminar	0 - 0 - 0 - 2	50	-		50
2.	**22MCA4II1**	Industry Internship (3 weeks)	0 - 0 - 0 - 2	50	-		50
3.	**22MCA4PW1**	Project Work (During 4th Semester- 16 weeks)	0 - 0 - 0 - 18	50	**125**	**75**	250
Total			**Credits:22**	**150**	**-**		**350**

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: MOBILE APPLICATIONS

Subject Code: 22MCA301 **L-T-P-C: 3 - 1 - 0 - 4**

Course Objectives:

Sl.No	Course Objectives
1	Teach various App development approaches and Android architecture.
2	Introduce App development environment and Android app project structure.
3	Introduce various UI resources, elements and event handling and illustrate the working aspects of android logical components.
4	Familiarize with various types of data persistence and access and demonstrate Android graphics, animation and multimedia.

Course Outcomes:

Course Outcome	Descriptions
CO1	Setup Android App Development Environment and traverse Android Project Structure.
CO2	Design UI and implement the logical components: Activity, Service, Broadcast Receiver and Content Provider.
CO3	Deal with various types of data persistence and access methods
CO4	Design Apps using Graphics, Animation, Multimedia, Location Services, Maps and Sensor Services.

UNIT	Description	Hours
I	Mobility and Android: Introduction, Mobility Panorama, Mobile Platforms, App Development Approaches, Android Overview. Getting Started with Android: Introduction, Setting up Development Environment, Saying Hello to Android, Traversing an Android App Project Structure, Logical Components of an Android App, Android Tool Repository, Installing and Running App Devices. Learning with an Application - 3 Cheers Cable: Introduction, 3Cheers Cable App, Mobile App Development Challenges, Tenets of a Winning App.	11
II	Building Blocks: App User Interface, Introduction, Activity, UI Resources, UI Elements and Events, Interaction among Activities, Let's Apply, Fragments, Action Bar. App Functionality – Beyond UI: Introduction, Threads, AsyncTask, Service, Notifications, Intents and Intent Resolution, Broadcast Receivers, Telephony and SMS.	11
III	App Data-Persistence and Access: Introduction, Flat Files, Shared Preferences, Relational Data, Data Sharing Across Apps, Enterprise Data. Sprucing up Graphics and Animation: Graphics and Animation, Introduction, Android Graphics, Android Animation.	10
IV	Multimedia: Introduction, Audio, Video and Images, Playback, Capture and Storage. Location Services & Maps: Introduction, Google Play Services, Location Services, Maps.	10
V	Sensors: Introduction, Sensors in Android, Android Sensor Framework, Motion Sensors, Position Sensors, Environment Sensors. Testing Android Apps: Introduction, Testing Android App Components, App Testing Landscape Overview. Publishing Apps: Introduction, Groundwork, Configuring, Packaging, Distributing.	10

Question paper Pattern:

The question paper will have eight questions.

- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	AnubhavPradhan Anil V. Deshpande	Composing Mobile Apps using Android: Learn| Explore| Apply	Wiley	First Edition	2014

Reference Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Barry Burd	Android Application Development All in one for Dummies	-	Edition: 1	-
2	SAMS	Teach Yourself Android Application Development In 24Hours		Edition: 1	-

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: BIG DATA AND ANALYTICS

Subject Code: 22MCA302 **L-T-P-C: 3 -1 -0- 4**

Course Objectives:

Sl.No	Course Objectives
1	Understand the Big Data Platform and its Use cases
2	Introduce students the concept and challenge of big data
3	Provide HDFS Concepts and Interfacing with HDFS
4	Teach students in applying skills and tools to manage and analyze the big data.

Course outcomes:

Course Outcome	Descriptions
CO1	Identify the characteristics of datasets and compare the trivial data and big data for various applications.
CO2	Demonstrate an open source software framework called Hadoop and supported tool to empower any meaningful conversation on Big data and analytics.
CO3	Compare and Contrast different Hadoop supporting tools with traditional tool
CO4	How Big Data can be analyzed to extract knowledge and apply tools for bigdata analytics

UNIT	Description	Hours
I	**Getting an Overview of Big Data:** What is Big Data? History of Data Management-Evolution of Big Data, Structuring Big Data-Types of Data, Elements of Data, Advantages of Big Data Analytics Introducing Technologies for Handling Big Data Distributed and Parallel Computing for Big Data, Introducing Hadoop, Cloud Computing and Big Data: Cloud Delivery Models, Cloud Services for Big Data, Cloud Providers in Big Data Market, In-Memory Computing Technology for Big Data.	11
II	**Understanding Hadoop** Ecosystem :Hadoop Ecosystem, Hadoop Distributed File System: HDFS Architecture, Concept of Blocks in HDFS in HDFS Architecture, NameNodes and DataNodes, The Command-line Interface, Using HDFS Files, HDFS High Availability, Features of HDFS, MapReduce, Hadoop YARN, Introducing HBase: HBase Architecture, Regions, Storing Big Data with Hbase, Interacting with Hadoop Ecosystem, Hbase in Operation – Programming with HBase, Combining HBase and HDFS: REST and Thrift, Data Integrity in HDFS, Features of HBase, Hive, Pig and Pig Latin, Sqoop, Zookeeper, Flume, Oozie	11
III	**Understanding MapReduce** Fundamentals and HBasE:The MapReduce Framework: Exploring the Features of MapReduce , working of MapReduce, Exploring Map and Reduce functions. Techniques to Optimize MapReduce Jobs: Harware / Network Topology, Synchronization, File System. Uses of MapReduce, Role of HBase in Big data Processing: Characteristics of HBase, Installation of HBase.	10
IV	**Introduction to MongoDB and Cassandra**: Introduction to MongoDB: What is and Why MongoDB? Terms used in RDBMS and MongoDB, Data types in MongoDB,MongoDB Query language. Apache Cassandra, features, CQL data types, CQLSH, key spaces, CRUD, collections, TTL, using a counter, ALTER commands, import and export, query system tables.	10
V	**Introduction to Hive and Pig:**what is Hive? , Hive Architecture, Hive Data Types, Hive File Format, Hive Query Language (HQL), RCFile Implementation, SerDe, User-defined Function (UDF). What is Pig? The Anatomy of Pig, Pig on Hadoop , Pig Philosophy, Use Case for Pig: ETL Processing, Pig Latin Overview , Data Types in Pig ,Running Pig , Execution Modes of Pig ,HDFS Commands ,Relational Operators, Eval Function, Complex Data Types ,Piggy Bank, User- Defined Functions (UDF) ,Parameter Substitution , Diagnostic Operator , Word Count Example using Pig ,When to use Pig? When not to use Pig? Pig at Yahoo!, Pig versus Hive.	10

Question paper Pattern:

The question paper will have eight questions.

- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl. No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Big Data: Black Book	Dt Editorial Services	Dreamtech Press,	978- 93-5119-931-1	2019
2	Big Data and Analytics	Seema Acharya, Subhashini Chellappan	1st Edition, Wiley India	ISBN:978-81-265-5478-2	2015

Reference Books:

Sl.No	Author	Text Book title	Publisher, Year,	Volume / Issue	Year of Edition
1	Hadoop in Practice	Alex Holmes	Manning Publications Co.,	ISBN-13:978-9351197423	2nd Edition, 2015
2	Programming Pig	Alan Gates	O'Reilly Media	ISBN-978-1-491-93709-9	2nd Edition, 2017
3	Programming Hive	Dean Wampler	O'Reilly Media,	ISBN:978-1-449-31933-5	1st Edition, 2012

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: INTERNET OF THINGS

Subject Code: 22MCA303 **L-T-P-C: 3 -1 -0- 4**

Course Objectives:

Sl.No	Course Objectives
1	Analyse the IoT architecture and design along with functional/compute stack and data management and apply IOT architecture for a given problem.
2	Analyse the application protocol, transport layer methods for the given business case.
3	Analyse the application of data analytics for IOT for a given.
4	Analyse the architecture and develop programming using modern tools for the given use case.

Course Outcomes:

Course Outcome	Descriptions
CO1	Interpret the impact and challenges posed by IoT networks leading to new architectural models
CO2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
CO3	Appraise the role of IoT protocols for efficient network communication and elaborate the need for data analytics and security in IoT.
CO4	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.

UNIT	Description	Hours
I	What is IoT?, Genesis of IoT, IoT and Digitization, IoT Impact, Convergence of IT and IoT, IoT Challenges, IoT Network Architecture and Design, Drivers Behind New Network Architectures, Comparing IoT Architectures, A Simplified IoT Architecture, The Core IoT, Functional Stack, IoT Data Management and Compute Stack.	11
II	Smart Objects: The "Things" in IoT, Sensors, Actuators, and Smart Objects, Sensor Networks, Connecting Smart Objects, Communications Criteria, IoT Access Technologies.	11
III	IP as the IoT Network Layer, The Business Case for IP, The need for Optimization, Optimizing IP for IoT, Profiles and Compliances, Application Protocols for IoT, The Transport Layer, IoT Application Transport Methods.	10
IV	Data and Analytics for IoT, An Introduction to Data Analytics for IoT, Machine Learning, Big Data Analytics Tools and Technology, Edge Streaming Analytics, Network Analytics, Securing IoT, A Brief History of OT Security, Common Challenges in OT Security, How IT and OT Security Practices and Systems Vary, Formal Risk Analysis Structures: OCTAVE and FAIR.	10
V	IoT Physical Devices and Endpoints - Arduino UNO: Introduction to Arduino, Arduino UNO, Installing the Software, Fundamentals of Arduino Programming. IoT Physical Devices and Endpoints - RaspberryPi: Introduction to RaspberryPi, About the RaspberryPi Board: Hardware Layout, Operating Systems on RaspberryPi, Configuring RaspberryPi, Programming RaspberryPi with Python, Smart City Use-Case Examples.	10

Question paper Pattern:

The question paper will have eight questions.

- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry	IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things	Pearson Education Cisco Press Indian Reprint	1	_
2	Srinivasa K G	Internet of Things	ENGAGE Leaning India	_	2007

Reference Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Vijay Madisetti and ArshdeepBahga	Internet of Things (A Hands-on-Approach)	_	1	2014
2	Raj Kamal	Internet of Things: Architecture and Design Principles	McGraw Hill Education	1	2017

SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY- TUMAKURU
(A constituent College of Siddhartha Academy of Higher Education, Tumakuru)

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: BLOCK CHAIN TECHNOLOGY

Subject Code: 22MCA3PE41 **L-T-P-C: 3 - 0 - 0 - 3**

Course Objectives:

Sl.No	Course Objectives
1	Understand the building blocks of Block chain.
2	Analyze the importance of block chain applications.
3	Evaluate the usage of Block chain features.
4	Exemplify the usage of bit coins and analyze the application specific block chain architecture for a given problem.

Course Outcomes:

Course Outcome	Descriptions
CO1	Illustrate the technologies of blockchain.
CO2	Describe the models of blockchain.
CO3	Analyze and demonstrate the Ethereum.
CO4	Analyze and demonstrate Hyperledger fabric.

NIT	Description	Hours
I	Introduction to Block chain, How Block chain works, Block chain Vs Bit coin, Practical applications, public and private key basics, pros and cons of Block chain, Myths about Bit coin.	8
II	Block chain Architecture, versions, variants, use cases, Life use cases of block chain, Block chain Vs shared Database, Introduction to crypto currencies, Types, Applications.	8
III	Concept of double spending, Hashing, Mining, Proof of work. Introduction to Merkel tree, Privacy, payment verification, Resolving Conflicts, Creation of Blocks.	8
IV	Introduction to Bit coin, key concepts of Bit coin, Merits and De Merits Fork and Segwits, Sending and Receiving bit coins, choosing bit coin wallet, Converting Bit coins to Fiat Currency.	8
V	Introduction to Ethereum, Advantages and Disadvantages, Ethereum Vs Bitcoin, Introduction to Smart contracts, usage, application, working principle, Law and Regulations. Case Study.	8

Question paper Pattern:

The question paper will have eight questions.
- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Arshdeep Bikram aditya Signal, GautamDhameja	Beginning Block chain: A Beginner's Guide to Building Block chain Solutions	APress	-	-
2	Bahga, VijayMadisetti	Block chain Applications: A Hands-On Approach	-	-	-

Reference Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Melanie Swan	Block chain	OReilly	-	-
2	Aravind Narayan. Joseph Bonneau	Bitcoin and Cryptocurrency Technologies	-	-	-

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: CLOUD COMPUTING

ubject Code: 22MCA3PE42 **L-T-P-C: 3 - 0 - 0 - 3**

Course Objectives:

Sl.No	Course Objectives
1	Demonstrate the system & software models and mechanisms that support cloud computing.
2	Classify various cloud services and their providers.
3	Compare various cloud deployment models.
4	Differentiate various types of computing environments and Identify enabling technologies of cloud computing.

Course Outcomes:

Course Outcome	Descriptions
CO1	Compare the strengths and limitations of cloud computing.
CO2	Identify the architecture, infrastructure and delivery models of cloud computing.
CO3	Apply suitable virtualization concept.
CO4	Choose the appropriate cloud player.

UNIT	Description	Hours
I	Introduction to Cloud Computing: Eras of computing, The vision of Cloud Computing, Defining a cloud, A closer look, Cloud computing reference model, Historical developments: Distributed systems, Virtualization, Web 2.0; Service oriented computing; Utility oriented computing.	8
II	Architectures for parallel and distributed computing: Parallel Vs Distributed computing, Elements of distributed computing, Technologies for distributed computing.	8
III	Virtualization: Introduction, Characteristics of virtualized environments, Taxonomy of virtualization techniques, Virtualization and cloud computing, Pros and cons of virtualization, Technology examples: Xen: Para virtualization, VmWare: Full virtualization, Microsoft Hyper – V.	8
IV	Cloud computing architecture: Introduction, Cloud reference model: Architecture, IaaS, PaaS, SaaS, Types of Clouds: Public, Private, Hybrid and Community clouds, Economics of the cloud, Open challenges.	8
V	Cloud Tools and Applications: Aneka PaaS; Open stack: Introduction to open stack; Components of open stack; Amazon web services; Google AppEngine; Microsoft Azure; Scientific applications: Healthcare; Biology; Geo-Science, Business and Consumer applications: ARM & ERP; Productivity; Social networking.	8

Question paper Pattern:

The question paper will have eight questions.
- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Rjkumar Buyya, Christian Vecchiola, ThamaraiSelci	Mastering Cloud Computing	Tata McGraw Hill, New Delhi, India	-	2013

Reference Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Judith Hurwitz, R.Bloor, M. Kanfman, F.Halper	Cloud Computing for Dummies	Wiley India Edition	--	-
2	J.Vette, Toby J. Vette, Robert Elsenpeter	Cloud Computing: A Practical Approach	Tata McGraw Hill	-	-

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: NATURAL LANGUAGE PROCESSING

Subject Code: 33MCA3PE43 **L-T-P-C: 3- 0 - 0 - 3**

Course Objectives:

Sl.No	Course Objectives
1	Teach students the leading trends and systems in natural language processing.
2	Make them understand the concepts of morphology, syntax, semantics and pragmatics of the language and that they are able to give the appropriate examples that will illustrate the above mentioned concepts.
3	Teach them to recognize the significance of pragmatics for natural language understanding.
4	Enable students to be capable to describe the application based on natural language processing and to show the points of syntactic, semantic and pragmatic processing.

Course Outcomes:

Course Outcome	Descriptions
CO1	Understand approaches to syntax and semantics in NLP.
CO2	Understand approaches to discourse, generation, dialogue and summarization within NLP.
CO3	Understand current methods for statistical approaches to machine translation.
CO4	Apply parsing technique to the given problem and verify the output and give valid conclusions.

UNIT	Description	Hours
I	Introduction, Morphology: Knowledge in Speech & Lang Processing, Ambiguity, Models & Algorithms, Language, Thought & Understanding, Some Brief History, The State of the Art & Near-Term Future, Summary Morphology and Finite State Transducers: Survey of English Morphology, Finite state Morphological Parsing, Lexicon-Free FST: The Porter Stemmer, Human Morphological Parsing, Summary, Combining FST Lexicon and Rules.	8
II	N-Grams: Counting Words in Corpora, Simple N-Grams, Smoothing, Back off, Deleted Interpolation, N-Grams for Spelling and Pronunciation, Entropy, Summary. Word Classes and Part-of- Speech Tagging: English Word Classes, Tag sets for English, Part- of-Speech Tagging.	8
III	Context-Free Grammars and Predicate Calculus for English: Constituency, Context-Free Rules and Trees, Sentence Level Constructions, Coordination, Agreement, The Verb Phrase Sub Categorization, Auxiliaries, Spoken Language Syntax, Grammar Equivalence and Normal Form, Finite –State and Context- Free Grammars, Grammars and Human Processing, The Early Algorithm, Finite-State Parsing Method, Summary Representing Meaning:	8
IV	Semantic Analysis: Syntax-Driven Semantic Analysis, Attachments for a Fragment of English, Integrating Semantic Analysis into the Earley Parser, Idioms and Compositionality, Robust Semantic Analysis, Summary. Lexical Semantics: Relations Among Lexemes and Their Senses, WordNet: A Database of Lexical Relations, The Internal Structure of Words, Creativity and the Lexicon, Summary Word Sense Disambiguation and Information.	8
V	Retrieval: Selection Restriction Based Disambiguation, Robust Word Sense Disambiguation, Information Retrieval, Other Retrieval Tasks, and Summary. Case Study of Simple Text Recognition or Content Based Text Extraction System. Evolving Explanatory Novel Patterns for Semantically-Based Text Mining: Related Work, A Semantically Guided Model for Effective TextMining.	8

Question paper Pattern:

The question paper will have eight questions.

- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Daniel Jurafsky, James H Martin	Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition.	Prentice Hall	2009	2nd Edition
2	ChristopherD.Manning, HinrichSchutze	Foundations of Statistical Natural Language Processing	MIT Press		1999

Reference Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	TanveerSiddiqui, U.S. Tiwary	Natural Language Processing and Information Retrieval	Oxford University Press	-	2008
2	AnneKaoand Stephen R. Poteet (Eds),	Natural Language Processing and Text Mining	Springer Verlag London Limited	-	2007

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: SOFTWARE TESTING

Subject Code: 22MCA3PE44 **L-T-P-C: 3 - 0 - 0 - 3**

Course Objectives:

Sl.No	Course Objectives
1	Acquire knowledge of basic principles and knowledge of software testing and debugging and test cases.
2	Will be able to understand the perceptions on testing like levels of testing, generalized pseudo code and with related examples and to study the various types of testing.
3	Differentiate between functional testing and structural testing.
4	Analyze the performance of fault based testing, planning and Monitoring the process, Documentation testing.

Course Outcomes:

Course Outcome	Descriptions
CO1	Various test processes and continuous quality improvement.
CO2	Types of errors and fault models.
CO3	Methods of test generation from requirements.
CO4	Behavior modeling using UML

UNIT	Description	Hours
I	Basics of Software Testing, Basic Principles, Test case selection and Adequac: Humans, Errors and Testing, Software Quality; Requirements, Behavior and Correctness, Correctness Vs Reliability; Testing and Debugging; Test Metrics; Software and Hardware Testing; Testing and Verification; Defect Management; Execution History; Test Generation Strategies; Static Testing; Test Generation from Predicates. Sensitivity, Redundancy, Restriction, Partition, Visibility and Feedback, Test Specification and cases, Adequacy Criteria, Comparing Criteria.	8
II	A perspective on Testing: Basic definitions, Test cases, Insights from a Venn diagram, Identifying test cases, Error and fault taxonomies, Level of testing, Examples: Generalized pseudo code, The triangle problem, the Next Date function, The commission problem, The SATM (Simple Automation Teller Machine) problem, The currency converter, Saturn windshield wiper.	8
III	Boundary value testing, Equivalence class testing, Decision table based testing: Boundary value analysis, Robustness testing, Worst-case testing, special value testing, Examples, Random testing, Equivalence classes, Equivalence test cases for triangle problem, Next Date function and commission problem, Guidelines and observations, Decision tables, Test cases for triangle problem.	8
IV	Path Testing, Data flow testing, Levels of Testing, Integration Testing: DD Paths, Test coverage metrics, Basis path testing, guidelines and observations, Definition Use testing, Slice based testing, Guidelines and observations. Traditional view of testing levels, Alternative life cycle models, the SATM systems, separating integration and system testing, guidelines and observations.	8
V	Fault Based Testing, Planning and Monitoring the Process, Documenting Analysis and Test: Assumptions in fault-based testing, Mutation Analysis, Fault-based Adequacy Criteria; Variations on mutation Analysis; From Test case specification to Test Cases, Scaffolding, Generic vs. specific Scaffolding, Test Oracles, Self checks as oracles, Capture and Replay.	8

Question paper Pattern:

The question paper will have eight questions.

- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Adithya P. Mathur	Foundations of Software Testing – Fundamental Algorithms and Techniques	Pearson Education India	-	2011
2	Mauro Pezze, Michael Young	Software testing and Analysis- Process, Principles and Techniques	Wiley India	-	2012

Reference Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Paul C Jorgensen	Software Testing A Craftsman's Approach", Auerbach publications	3rd edition	-	2011
2	KshirasagaraNaik, PriyadarshiTripathy	Software Testing and Quality Assurance	Wiley India	-	2012
3	M.G.Limaye	Software Testing- Principles, Techniques and Tools	McGraw Hill	-	2009

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: WEB SERVICES

Subject Code: 22MCA3PE45 **L-T-P-C: 3 - 0 - 0 - 3**

Course Objectives:

Sl.No	Course Objectives
1	To learn the Principles of Web & Web Services
2	To learn XML Document in both DTD and XML Schema Language.
3	To design Web Services and its Infrastructure, Use of SOAP, Building a Web Service, Deploying and Publishing Web Service
4	To Design Web Services Architecture, UDDI Registry

Course Outcomes:

Course Outcome	Descriptions
CO1	To Design Web & Web Services
CO2	To Design the schema for the given XML documents in both DTD and XML Schema languages
CO3	To Building a Web Service, SOAP, Deploying and Publishing Web Service
CO4	Analyze Web Services Architecture, UDDI Registry.

UNIT	Description	Hours
I	**Introduction to Web Services :** The definition of web services, basic operational model of web services benefits and challenges of using web services,Core distributed computing technologies – client/server, CORBA, JAVA RMI, Micro Soft DCOM, MOM, Challenges in distributed computing role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA)	8
II	**Xml Technology:**Role Of XML, XML - Name Spaces - Structuring With Schemas and DTD, Presentation Techniques - Transformation - XML Infrastructure	8
III	**SOAP:** Core fundamentals of SOAP – SOAP Messages Structure, SOAP encoding SOAP message exchange models SOAP communication and messaging SOAP security, Developing Web Services using SOAP- Building SOAP Web Services, developing SOAP Web Services using Java, limitations Of SOAP	8
IV	**Web Services: Overview** - Architecture - Key Technologies - WSDL, ebXML - SOAP And Web Services In E-Com - Overview Of .NET And J2EE. – WSDL in the world of Web Services, Web Services life cycle, anatomy of WSDL definition document, WSDL bindings	8
V	**Discovering Web Services** : Service discovery, role of service discovery in a SOA service discovery mechanisms, UDDI-UDDI Registries, uses of UDDI Registry, Programming with UDDI, UDDI data structures, support for categorization in UDDI registries publishing API Publishing information to a UDDI Registry searching information in UDDI Registry deleting information in a UDDI	8

Question paper Pattern:

The question paper will have eight questions.
- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Adithya P. Mathur	Foundations of Software Testing – Fundamental Algorithms and Techniques	Pearson Education India	-	2011
2	Mauro Pezze, Michael Young	Software testing and Analysis- Process, Principles and Techniques	Wiley India	-	2012

Reference Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Paul C Jorgensen	Software Testing A Craftsman's Approach", Auerbach publications	3rd edition	-	2011
2	KshirasagaraNaik, PriyadarshiTripathy	Software Testing and Quality Assurance	Wiley India	-	2012
3	M.G.Limaye	Software Testing- Principles, Techniques and Tools	McGraw Hill	-	2009

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: DEEP LEARNING

Subject Code: 22MCA3PE51 **L-T-P-C: 3 - 0 - 0 - 3**

Course Objectives:

Sl.No	Course Objectives
1	Demonstrate the basics of deep learning and Implement various deep learning models.
2	Realign high dimensional data using reduction techniques.
3	Analyze optimization and generalization in deep learning.
4	Analyse the deep learning applications.

Course Outcomes:

Course Outcome	Descriptions
CO1	Identify the deep learning algorithms which are more appropriate for various types of learning tasks in various domains.
CO2	Implement deep learning algorithms and solve real-world problems.
CO3	Execute performance metrics of Deep Learning Techniques.

UNIT	Description	Hours
I	Introduction to machine learning- Linear models (SVMs and Perceptron's, logistic regression) - Intro to Neural Nets: What a shallow network computes- Training a network: loss functions, back propagation and stochastic gradient descent- Neural networks as universal function approximates.	8
II	Deep networks: History of Deep Learning- A Probabilistic Theory of Deep Learning- Back propagation and regularization, batch normalization- VC Dimension and Neural Nets- Deep Vs Shallow Networks Convolutional Networks- Generative Adversarial Networks. (GAN), Semi- supervised Learning.	8
III	Dimensionality reduction: Linear (PCA, LDA) and manifolds, metric learning - Auto encoders and dimensionality reduction in networks - Introduction to Convnet - Architectures – AlexNet, VGG, Inception, ResNet - Training a Convnet: weights initialization, batch normalization, hyper parameter optimization.	8
IV	Optimization and generalization: Optimization in deep learning– Non-convex optimization for deep networks- Stochastic Optimization Generalization in neural networks- Spatial Transformer Networks- Recurrent networks, LSTM - Recurrent Neural Network Language Models- Word-Level RNNs & Deep Reinforcement Learning - Computational & Artificial Neuroscience.	8
V	Case study and applications: Imagenet- Detection-Audio Wave Net-Natural Language Processing Word2Vec - Joint Detection Bio Informatics- Face Recognition- Scene Understanding- Gathering Image Captions.	8

Question paper Pattern:

The question paper will have eight questions.

- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Cosma Rohilla Shalizi	Advanced Data Analysis from an Elementary Point of View	-	-	2015

Reference Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Deng & Yu	Deep Learning: Methods and Applications	Now Publishers	-	2013
2	Ian oodfellow, YoshuaBengio, Aaron ourville	Deep Learning	MIT Press	-	2016
3	Michael Nielsen	Neural Networks and Deep Learning	Determination Press	-	2015

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: PATTERN RECOGNITION

Subject Code: 22MCA3PE52 **L-T-P-C: 3 - 0 - 0 - 3**

Course Objectives:

Sl.No	Course Objectives
1	Understand the concept of a pattern and the basic approach to the development of pattern recognition and machine intelligence algorithms.
2	Understand the basic methods of feature extraction, feature evaluation, and data mining.
3	Understand and apply both supervised and unsupervised classification methods to detect and characterize patterns in real-world data.
4	Develop prototype pattern recognition algorithms that can be used to study algorithm behavior and performance against real-world multivariate data.

Course Outcomes:

Course Outcome	Descriptions
CO1	Familiar with general approaches such as Bayes Classification, Nearest Neighbor Rule, Neural Networks and more often used modern classification techniques such as Support Vector Machines and Multiclassifiers for solving Bio'Medical problems.
CO2	Design systems and algorithms for pattern recognition (signal classification), with focus on sequences of patterns that are analyzed using, e.g., hidden Markov models (HMM)
CO3	Analyse classification problems probabilistically and estimate classifier performance and Apply Maximum-likelihood parameter estimation in relatively complex probabilistic models, such as mixture density models and hidden Markov models,
CO4	Understand the principles of Bayesian parameter estimation and apply them in relatively simple probabilistic models

UNIT	Description	Hours
I	Introduction, Machine perception, pattern recognition systems, design cycle, learning and adaptation, Applications of pattern recognition. Probability, Introduction, probability of events, random variables, Joint distributions and densities, moments of random variables, estimation of parameters from samples, minimum risk estimators.	8
II	Statistical Decision Making, Introduction, Baye's Theorem, multiple features, conditionally independent features, decision boundaries, unequal costs of error, estimation of error rates, the leaving one- out technique. Characteristic curves, estimating the composition of populations.	8
III	Nonparametric Decision Making, Introduction, histograms, Kernel and window estimators, nearest neighbor classification techniques, adaptive decision boundaries, adaptive discriminate Functions, minimum squared error discriminate functions, choosing a decision making technique.	8
IV	Unsupervised Learning and Clustering, Unsupervised Bayesian learning, data decryption and clustering, criterion functions and clustering, Hierarchical clustering, Online clustering, component analysis.	8
V	Artificial Neural Networks: Introduction, nets without hidden layers. Nets with hidden layers, the back Propagation algorithms, Hopfield nets, an application.	8

Question paper Pattern:

The question paper will have eight questions.
- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Duda R. O., and Hart P E., and Stork D G	Pattern Classification	Wiley Publishers	_	_
2	Earl Gose, Richard J and Steve J	Pattern Recognition and Image Analysis	PHI	_	_

Reference Books:

Sl No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Robert Schalkoff	Pattern recognition (Statistical, structural and Neural Approaches),	_	_	_
2	Sergios The doridis & KonstantinosKoutrumbas,	Pattern Recognition,	Elsevier Academic Press	4	_

SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY- TUMAKURU
(A constituent College of Siddhartha Academy of Higher Education, Tumakuru)

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: Object Oriented Programming in C#

Subject Code: 22MCA3PE53 **L-T-P-C: 3 - 0 - 0 - 3**

Course Objectives:

Sl.No	Course Objectives
1	Familiarize .NET Framework
2	Programming in C # programming language
3	Knowledge of object-oriented paradigm in the C # programming language
4	Familiarize with various concepts like delegates, events, exception handling and Windows forms components.

Course Outcomes:

Course Outcome	Descriptions
CO1	Knowledge of the structure and model of the programming language C #
CO2	Use the programming language C # for various programming technologies (understanding)
CO3	Develop software in C # (application)
CO4	Evaluate user requirements for software functionality required to decide whether the programming language C # can meet user requirements (analysis)

UNIT	Description	Hours
I	Getting started with .NET Framework 4.0 and C# Understanding Previous Technologies, Benefits of .NET Framework, Architecture of .NET Framework 4.0, .NET Execution Engine, Components of .NET Framework 4.0: CLR, CTS, Metadata and Assemblies, .NET Framework Class Library, Windows Forms, ASP .NET and ASP .NET AJAX, ADO .NET, Windows workflow Foundation, Windows Presentation Foundation, Windows Communication Foundation, Widows Card Space and LINQ. Introducing C# Creating a Simple C# Console Application, Identifiers and Keywords. System Data Types, Variables and Constants: Value Types, Reference Types, Understanding Type Conversions, Boxing and UnBoxing. Namespaces, The System namespace, .NET Array Types.	8
II	Classes, Objects and Object Oriented Programming Classes and Objects: Creating a Class, Creating an Object, Using this Keyword, Creating an Array of Objects, Using the Nested Classes, Defining Partial Classes and Method, Returning a Value from a Method and Describing Access Modifiers. Static Classes and Static Members, Properties: Read-only Property, Static Property, Indexers, Structs: Syntax of a struct and Access Modifiers for structs, System. Object Class.	8
III	Encapsulation: Encapsulation using accessors and mutators, Encapsulation using Properties. Inheritance: Inheritance and Constructors, Sealed Classes and Sealed Methods, Extension methods. Polymorphism: Compile time Polymorphism/ Overloading, Runtime Polymorphism/ Overriding. Abstraction: Abstract classes, Abstract methods. Interfaces: Syntax of Interfaces, Implementation of Interfaces and Inheritance.	8
IV	Delegates, Events, Exception Handling: Delegates: Creating and using Delegates, Muticasting with Delegates. Events: Event Sources, Event Handlers, Events and Delegates, Multiple Event Handlers. Exception Handling: The try/catch/throw/finally statement, Custom Exception. System Exception, Handling Multiple Exceptions.	8
V	Graphical User Interface with Windows Forms: A Simple Event- Driven GUI, Control Properties and Layout, Labels, TextBoxes and Buttons, GroupBoxes and Panels, CheckBoxes and RadioButtons, ToolTips Mouse-Event Handling, Keyboard-Event Handling. Menus, Month Calendar Control, LinkLabel Control, ListBox Control, ComboBox Control, TreeView Control, ListView Control, TabControl and Multiple Document Interface (MDI).	8

Question paper Pattern:

The question paper will have eight questions.

- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Master of Computer Applications

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Black Book	.NET 4.0 Programming (6-in-1), Black Book	Wiley- Dream Tech Press	-	-
2	Paul Deitel and Harvey Deitel	C# 2010 for Programmers	Pearson Education	4th Edition	-

Reference Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Andrew Trolsen	Pro C# 5.0 and the .NET 4.5 Framework	Wiley-Appress	6th Edition	-
2	Bart De Smet	C# 4.0 Unleashed	Pearson Education-SAMS Series	-	-
3	Herbert Schildt	Complete Reference C# 4.0	Tata McGraw Hill	-	2010

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: ARTIFICIAL INTELLIGENCE

Subject Code: 22MCA3PE54 **L-T-P-C: 3 -0 -0- 3**

Course Objectives:

Sl.No	Course Objectives
1	Identify problems that are amenable to solution by AI methods.
2	Identify appropriate AI methods to solve a given problem.
3	Formalize a given problem in the language/framework of different AI methods.
4	Design and carry out an empirical evaluation of different algorithms on problem formalization, and state the conclusions that the evaluation supports.

Course Outcomes:

Course Outcome	Descriptions
CO1	Acquire knowledge of Uncertainty and Problem solving techniques, Symbolic knowledge representation to specify domains and Reasoning tasks of a situated software agent
CO2	Comprehend on different logical systems for inference over formal domain representations and trace on particular inference algorithm working on a given problem specification
CO3	Apply and Analyse AI technique to any given concrete problem
CO4	Interpret and Implement non-trivial AI techniques in a relatively large system

UNIT	Description	Hours
I	Introduction to AI and production systems: Introduction to AI-Problem formulation, Problem Definition -Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics -Specialized productions system- Problem solving methods – Problem graphs, Matching, Indexing and Heuristic functions -Hill Climbing-Depth first and Breath first, Constraints satisfaction – Related algorithms, Measure of performance and analysis of search algorithms.	8
II	Representation of knowledge: Game playing – Knowledge representation, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic-Structured representation of knowledge.	8
III	Knowledge inference: Knowledge representation -Production based system, Frame based system. Inference – Backward chaining, Forward chaining, Rule value approach, Fuzzy reasoning – Certainty factors, Bayesian Theory-Bayesian Network-Dempster – Shafer theory.	8
IV	Planning and machine learning: Basic plan generation systems – Strips -Advanced plan generation systems – K strips - Strategic explanations -Why, Why not and how explanations. Learning- Machine learning, adaptive Learning.	8
V	Expert systems: Architecture of expert systems, Roles of expert systems – Knowledge Acquisition – Meta knowledge, Heuristics. Typical expert systems – MYCIN, DART, XOON, Expert systems shells.	8

Question paper Pattern:

The question paper will have eight questions.

- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Kevin Nightand Elaine Rich, NairB	Artificial Intelligence (SIE) Chapters: I, II, VI & V	McGrawHil	_	2008
2	Dan W. Patterson	Introduction to AI and ES Chapters:III	Pearson Education	_	2007

Reference Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Peter Jackson	Introduction to Expert Systems	Pearson Education	3	2007
2	Stuart Russel and Peter Norvig	AI – A Modern Approach	Pearson Education	2	2007
3	Deepak Khemani	Artificial Intelligence	Tata McGraw Hill Education	_	2013

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: ETHICAL HACKING

Subject Code: 22MCA3PE55 **L-T-P-C: 3 -0 -0- 3**

Course Objectives:

Sl.No	Course Objectives
1	Teach students to think like an ethical hacker and at the same time follow the code of professional ethics and the prescribed cyber laws.
2	Make oneself aware of the cybercrimes that are taking place in the real world.
3	Learn about the different hacking tools and techniques and practically use these tools to gain better understanding of the ethical hacking concepts.
4	Provide a deep understanding of security issues, threats and concerns in the cyber world and provide countermeasures to curb hacking.

Course Outcomes:

Course Outcome	Descriptions
CO1	Recall the networking, sql, and encryption algorithm concepts to further study ethical hacking techniques, threats, tools and prevention against attacks.
CO2	Understand ethical hacking concepts, cases, ethics and cyberlaws.
CO3	Apply available hacking tools to find a solution to a given hacking issue.
CO4	Analyze and classify the real-world hacking cases and situations.

UNIT	Description	Hours
I	**Introduction to ethical Hacking:** What is ethical hacking? Types of 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.	8
II	**Footprinting and Reconnaissance:** What is footprinting? Active and passive footprinting, purpose of footprinting , objectives of footprinting, footprinting threats, Types of footprinting, footprinting countermeasures.	8
III	**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, anonymizers, IP spoofing and its countermeasures. **Enumeration and Sniffing:** What is Enumeration? Enumeration techniques, Enumeration types, Enumeration countermeasures, what is sniffing? Wiretrapping 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.	8
IV	**Trojans and other Attacks:** 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, IoT 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.	8
V	**Hacking web servers, web applications** **Session hijacking:** What is session hijacking? , why session hijacking is successful? Session hijacking techniques, session hijacking process, Types of session hijacking, session hijacking countermeasures: protecting and preventing, **Hacking web servers and web applications:** Causes of webservers being compromised, web server attacks, stages of web server attacks, defending against web server attacks, web application components, its working, architecture, web server attack vectors, web application threats and counter measures.	8

Question paper Pattern:

The question paper will have eight questions.

- **Each full question consists of 20 marks.**
- **Each full question will have sub questions covering all the topics under a unit.**
- **The students will have to answer 5 full questions.**

Text Books:

Sl.No	Author	Text Book title	Publisher	Volume / Issue	Year of Edition
1	Manthan Desai	Basics of ethical hacking for beginners.			
2	SunitBelapure and Nina Godbole,	Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives.			
3	Srinivasan, J. Suresh	Cloud Computing: A practical approach for learning and implementation	Pearson.		
4	Sean-Philip Oriyano, Sybex	Certified Ethical Hacker Study Guide v9		, Study Guide Edition,	2016.
5	Emmett Duley and Chuck Easttom			Comptia Security+ Study Guide.	
	Alana Maurushat	Ethical Hacking.			

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: MOBILE APPLICATIONS LAB

Subject Code: 22MCA3LB1 **L-T-P-C: 0 - 0 - 2 - 1**

Course Objectives:

Sl.No	Course Objectives
1	Teach various App development approaches and Android Architecture.
2	Introduce App Development environment and Android App Project Structure.
3	Introduce various UI resources, elements and event handling.
4	Illustrate the working aspects of android logical components

Course Outcomes:

Course Outcome	Descriptions
CO1	Setup Android App Development Environment and traverse Android Project Structure.
CO2	Design UI and implement the logical components: Activity, Service, Broadcast Receiver and Content Provider.
CO3	Deal with various types of data persistence and access methods
CO4	Design Apps using Graphics, Animation, Multimedia, Location Services, Maps and Sensor Services.

Sl.No	Description
1.	Android App that displays Hello World in a TextView.
2.	Android App that demonstrates event handling on EditText.
3.	Android App that uses RadioGroup and demonstrates event handling on Button.
4.	Android App that uses Check Boxes and demonstrates event handling on Button.
5.	Android App that validates the entered Phone number.
6.	Android App that performs read and writes operations on a Flat File.
7.	Android App that demonstrates creation of Custom view using Canvas to draw an image and to perform Touch event.
8.	Android App that implements a Counter using IntentService.

Question paper Pattern:

- **In the practical Examination student has to execute one program from a lot of all the 8 questions.**
- **Change of program is not permitted in the Practical Examination.**

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: BIG DATA LAB

Subject Code: 22MCA3LB2 **L-T-P-C: 0 - 0 - 2 - 1**

Course Objectives:

Sl.No	Course Objectives
1	Practice advance database programming concepts
2	Practice programming tools PIG in Hadoop eco system.
3	Practice programming tools HIVE in Hadoop eco system.
4	Implement best practices for Hadoop development.

Course Outcomes:

Course Outcome	Descriptions
CO1	Installation of Hadoop Ecosystem.
CO2	Implement the Pig latin scripts
CO3	Implementation of HADOOP in Ubuntu14.0 platform
CO4	Implementation of HIVE Programming

Sl.No	Description
1	**PART - A** Write a program to implement database triggers in PL/SQL by using following schema -employee(e_id, e_name, e_doj, e_salary, e_age, primary key(e_id)) i. Create an employee table and insert any five records. ii.Write row-level trigger for salary changes, Display the relevant message(insert / update / delete operations on employee)
2	Write a program to implement database triggers in PL/SQL by using following schema – employee(e_id,e_name,e_age, primary key(e_id)) i. Create an employee table and insert any five records. ii. Write a trigger to check the age of an employee is between 18 to 58, ifnot raise an error. (during insert / update / delete operations on employee)
3	Write a program to implement cursor in PL/SQL to display the employee details from the following table. emp (eno,ename,designation,doj,salary, primary key(eno))
4	Write a program to implement Procedure in PL/SQL to display the employee detailsfrom the following table. employee(eno, ename, designation, doj, salary , primary key(eno))
5	Write a program to implement packages in PL/SQL by using following schema. employee (id, name, age, address, salary, primary key (id)); i. Create the package for adding, removing and listing a Employee. ii. Display suitable output
I	**PART - B** Installation of HADOOP in Ubuntu14.0 platform Installation of HIVE Installation of PIG
II	**Execute the following commands in HIVE** A. To create a database named “STUDENTS” with comments and database pro B. To display the list of all databases C. To describe the database D. To describe the extended database E. To alter the database properties F. To make the database as current working database G. To drop database H. To create managed table named ‘STUDENT’. I. To describe the “STUDENT” table J. To create external table name “EXT_STUDENT”. K. To load data into the table from file named student.tsv

III	**Execute the following commands in PIG using the table** **Input :Student (rollno:int, name:chararray, gpa:float);** **Department(rollno:int, deptno:int, deptname:chararray);** A. Find the tuples of those student where the GPA is greater than 4.0 B. Display the name of all students in uppercase C. Group tuples of students based on gpa D. To remove duplicate tuples of students. E. Display the first 3 tuples from the "student" relation. F. Display the name of students in Ascending order G. To Join two relations namely "student" and "department " based on the value in the "rollno" column H. To merge the contents of relations namely "student" and "department"

Question paper Pattern:

- **In the practical Examination student has to execute one program from a lot of PART A AND PART B.**
- **Change of program is not permitted in the Practical Examination.**

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: III**

Subject Name: MINI PROJECT LAB

Subject Code: 22MCA3MP1 **L-T-P-C: 0 - 0 - 4 - 2**

Course Objectives:

Sl.No	Course Objectives
1	It provides application knowledge and techniques learnt in various aspects for developing the software for real problems.
2	Gives an insight into the working of the real organizations/companies.
3	Gaining deeper understanding in specific functional areas.
4	Helps in exploring career opportunities in their areas of interest.

Course Outcomes:

Course Outcome	Descriptions
CO1	Discover potential research areas in the field of IT.
CO2	Conduct a survey of several available literatures in the preferred field of study.
CO3	Compare and contrast the several existing solutions for research challenge.
CO4	Demonstrate an ability to work in teams and manage the conduct of the research study.

Sl.No	Description
1.	A team of only two students must develop the mini project. However during the examination, each student must demonstrate the project individually.
2.	The team may implement project of their choice using any one of the technologies learnt in current Semester like IoT, Machine learning, Android or any other technology along with designing of database (mandatory).
3.	The team must submit a brief project report (25-30 pages) that must include the following: • Introduction • Literature survey • Hardware & Software Requirements • System Design Architecture • Implementation (screenshots to be included) • Testing • Conclusion • Future enhancements. • Bibliography
4.	• The report must be evaluated for 10 Marks. • Demonstration for 30 Marks and Viva for10 Marks.

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: IV**

Subject Name: RESEARCH / TECHNICAL SEMINAR

Subject Code: 22MCA4TS1 **L-T-P-C: 0 - 0 - 0 - 2**

Course Objectives:

Sl.No	Course Objectives
1	Understand professional ethics, cyber regulations, and responsibilities.
2	Engage and learn independently for continual development as an IT professional.
3	Comprehend, write effective reports and make quality presentations.
4	Understand the impact of IT solutions on socio-environmental issues.

Course Outcomes:

Course Outcome	Descriptions
CO1	Analyse relevant topic in computing sciences and make valid conclusions on industry/society/environment using fundamental/ research based knowledge.
CO2	Demonstrate self-learning by making effective presentation and report writing.
CO3	Understand ethics, cyber regulations / responsibilities and demonstrate the same by using relevant / modern tool.
CO4	Exhibit leadership skills and advance in their chosen career.

Sl.No	Guidelines
1	CIE marks shall be awarded by a committee comprising of HoD as Chairman, Guide/co-guide, if any, and a senior faculty of the department.
2	Participation in the seminar by all the students of the programme shall be mandatory.
3	The CIE marks awarded for Technical Seminar shall be based on the evaluation of Seminar Report, Presentation skill and performance in Question and Answer session in the ratio 10:30:10.
4	Students may be assigned to do literature survey of existing work on contemporary topics and present in front of the research committee (compulsory).
5	Student shall highlight on the research gap and propose solution.

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: IV**

Subject Name: INDUSTRY INTERNSHIP (3 weeks)
Subject Code: 22MCA4II1 **L-T-P-C: 0 - 0 - 0 - 2**

Course Objectives:

Sl.No	Course Objectives
1	Develop innovative IT applications to meet industrial and societal needs.
2	Adapt themselves to changing IT requirements through life-long learning.
3	Exhibit leadership skills and advance in their chosen career.
4	To develop quality professionals in Computer Applications who can provide sustainable solutions to the societal and industrial needs.

Course Outcomes:

Course Outcome	Descriptions
CO1	Analyse the real-time industry/research work environment with emphasis on organizational structure/job process/different departments and functions / tools /technology.
CO2	Develop applications using modern tools and technologies.
CO3	Demonstrate self-learning capabilities with an effective report and detailed presentation.
CO4	Identify potential business opportunities and innovate to create value to the society and seize that opportunity.

Sl.No	Guidelines
1	The students shall undergo internship in the industry for a period of 3 weeks during the vacation immediately after the 3rd semester examination.
2	The internship shall be carried out in industry / R&D labs or institutions.
3	Internship should be presented along with the report by the end of 3 weeks.
4	There shall be at least one review conducted to find the status of the internship progress. This will carry 20 marks for presentation and 10 marks for question / answer.
5	The student shall prepare a report and submit the same to the guide allotted by the institute. This carries 20 marks.
6	The student shall present the progress about the internship to the panel of members constituted by the Head of the Department (HoD).

Syllabus for the Academic Year – 2023 - 2024

Department: MCA **Semester: IV**

Subject Name: PROJECT WORK (16 weeks)
Subject Code: 22MCA4PW1 **L-T-P-C: 0 - 0 - 0 - 18**

Course Objectives:

Sl.No	Course Objectives
1	Comprehend, write effective reports and make quality presentations.
2	Understand professional ethics, cyber regulations, and responsibilities.
3	Apply knowledge of computing fundamentals to provide IT solutions.
4	To develop quality professionals in Computer Applications who can provide sustainable solutions to the societal and industrial needs.

Course Outcomes:

Course Outcome	Descriptions
CO1	Adapt themselves to changing IT requirements through life-long learning
CO2	Facilitate effective learning environment through quality education, state-of-the-art facilities, and orientation towards research and entrepreneurial skills.
CO3	Understand professional ethics, cyber regulations, and responsibilities.
CO4	Analyse relevant topic in computing sciences and make valid conclusions on industry/society/environment using fundamental/ research based knowledge

Sl.No	Guidelines
1	The candidate should carry out the project in any industry or R&D organization or educational institution under a guide / co-guide.
2	The candidate has to present the work carried out before the examiners during the University examination.
3	The work carried out should be free from plagiarism.
4	The literature study may be clearly written which may be the summary of existing work and highlight of what are the functionalities that are proposed to the project.
5	Student shall indicate the different research papers, documents referred as a part of the literature study.
6	This is an individual project for duration of minimum of 4 months.
7	Regular project work weekly dairy should be maintained by the students, signed by the external guide and internal guide in order to verify the regularity of the student. (Enclosing the Format).
8	Project verification at the place of project work must mandatory by the internal guide, for completion of the work.
9	Project work may be application / testing or research oriented and accordingly the project report contents may vary.
10	The students are informed to strictly follow the report format as prescribed by the University. If the project report is not as per the format, internal guide / external examiner will have every right to reject the project.
11	Students are encouraged and appreciated to show their project code demo along with their power point slide show during their viva-voce exams as an added advantage.
12	The students are informed to strictly follow the report format as prescribed by the University. If the project report is not as per the format, internal guide / external examiner will have every right to reject the project.
13	**INTERNAL ASSESMENT : 50 Marks** **DISSERTATION : 125** **VIVA : 75** **TOTAL : 250 Marks**

Master of Computer Applications

Guidelines for the Preparation of Project Reports

1. Printing Area: The margins should be: Left: 1.25", Right: 1.00", Top and Bottom- 1.00". The text should be justified to occupy the full line width, so that the right margin is not ragged, with words hyphenated as appropriate. Please fill pages so that the length of the text runs to the right margin.

2. The report must be printed on one side only. Please use a high-resolution printer, preferably a laser printer with at least 300 dpi. Project reports must be printed neatly on one side of the paper on a A4 size bond paper. The reports submitted to the department/guide(s) must be hard bounded with dry tone Xerox.

3. Abstract: The abstract should summarize the contents of the report and should contain at least 150 and at most 350 words. It should be set in 12-point font size. There should be two blank (10-point) lines before and after the title ABSTRACT.

4. Layout, Typeface, Font Sizes, and Numbering: For the main text, please use 12-point type and 1.5 line spacing. We recommend using Times New Roman fonts. Italic type may be used to emphasize words in running text. Bold type and underlining should be avoided.

5. Headings: The chapter headings should be in capitals and must be separated from the other text by 24point line space. Headings should be in the form where each word is capitalized (i.e., nouns, verbs, and all other words except articles, prepositions, and conjunctions should be set with an initial capital) and should, with the exception of the title, be aligned to the left. The font sizes are given in Table 1.
Here are some examples of headings: "Criteria to Disprove Context-Freeness of Collage Languages", "On Correcting the Intrusion of Tracing Non-deterministic Programs by Software", "A User-Friendly and Extendable Data Distribution System", "Multi-flip Networks: Parallelizing GenSAT", "Self-determinations of Man".

Table 1 Font sizes of headings. Table captions should always be positioned above the tables. The final sentence of a table caption should end without a period

Heading	Example	Font Size and Style
Title	Chapter 1 Introduction	16 Point Bold
First Level Heading	1.1. Preamble	14 Point Bold
Second Level Heading	2.3.1. Mandatory or Regulatory Signs	12 Point Bold
Third Level Heading	Stop and Give away signs	12 Point Bold
Fourth Level Heading	*Creation of database*	12 Point Bold Italicized

Master of Computer Applications

Figures and Photographs:
Check that in line drawings, lines are not interrupted and have constant width. Grids and details within the figures must be clearly readable and may not be written one on top of the other. The lettering in figures should have a height of 2 mm (10-point type). Figures should be scaled up or down accordingly.

Figures should be numbered and should have a caption which should always be positioned under the figures, in contrast to the caption belonging to a table, which should always appear above the table. Please center the captions between the margins and set them in 9-point type (Fig. 1 shows an example). The distance between text and figure should be about 12 point spacing, the distance between figure and caption about 6 point spacing.

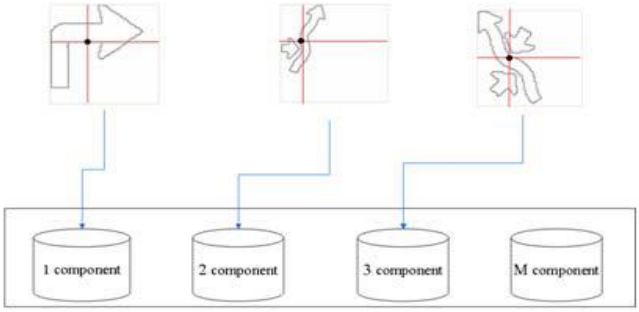

Fig 1.1.The last sentence of a figure caption should generally end without a period.

6. Formulas:
Displayed equations or formulas are centered and set on a separate line (with an extra line or half line space above and below). Displayed expressions should be numbered for reference. The numbers should be consecutive within each section or within the contribution, with numbers enclosed in parentheses and set on the right margin.

7. Program Code:
Program listings or program commands or algorithms in the text are normally set in typewriter font, e.g., CMTT10 or Courier.
Example of an Algorithm is:

Algorithm-1: Database Creation (Mean and Standard Deviation based approach)
Input: Static images of potential traffic sign.
Output: Database created.
Methodology:
For each input image do
Step1: Preprocess the image as explained in section 4.3.1
Step2: Calculate the number of components in a sign as explained in section 4.3.1.
Step3: calculate a feature vector as mentioned in section 4.3.2.1.
Step4: Store the feature vector computed in step 3 in the corresponding database, based on number of components present in the sign.
For End.
Algorithm End.

8. Footnotes/ Header:

Footnotes/Header should appear at the bottom of the normal text area, with a line of about 5 cm in Word set immediately below/above the text.

Header sample: (Project title is left aligned and page number is right aligned)
<<Project Title>> <<Page Number>>

Sample Footer:
<College Name> Department of MCA 2023-24

9. The list of references is headed "References" and is assigned a number with square brackets in the decimal system of headings. The list should be set in small print and placed at the end of the dissertation, in front of the appendix, if any exists. Please do not insert a page break before the list of references if the page is not completely filled. An example is given at the end of this information sheet. For citations in the text please use square brackets and consecutive numbers: [1], [2], [3] etc.

10. Page Numbering:
Reports must be printed with page numbers on the top right corner.

11. The total number of reports to be prepared is three:
- One copy to the concerned guide.
- One copy to candidate.
- Two CD's having soft copy of Project report (for department & Library purpose).

12. Before taking the final printout, the approval of the concerned guide is mandatory and suggested corrections, if any, must be incorporated.

13. Every copy of the report must contain (See formats towards the end of this document)
- Outer title page (parrot green) with a plastic cover.
- Inner title page (White).
- Certificate in the format enclosed, only certificate will be signed by following:
  - ✓ Principal
  - ✓ HOD
  - ✓ Internal guide

14. The **organization of the** report should be as follows:
a. Inner title page
b. Certificate
c. Project Completion certificate from Company / College
d. Declaration (by student)
e. Acknowledgement
f. Abstract
g. Table of Contents

h. List of table and figures
i. Main body of project

Proper attention has to be paid to the technical contents as well as to the organization of the report and clarity of the expression. Care should be taken to avoid spelling and typing errors. The student should note that report (write-up) forms the important component in the overall evaluation of the project.

Sample content (more suitable for Application oriented projects) is attached and number of pages may be 40-70 which can be modified as per guide's instructions depending on the project under development. The respective guides can decide how the content of the project report must be organized if the project is research oriented, as a specific format cannot be defined for various domains of research problem.

CONTENTS
(Application oriented Projects)

SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY- TUMAKURU
(A constituent College of Siddhartha Academy of Higher Education, Tumakuru)

(COVER PAGE)

PROJECT TITLE

A Dissertation submitted in partial fulfillment of the requirements for the award of degree of
MASTER OF COMPUTER APPLICATIONS

of

Sri Siddhartha Institute of Technology
(A constituent College of Sri Siddhartha Academy of Higher Education, Tumkur)

By

STUDENT NAME
(USN Number)

Under the Guidance of
GUIDE NAME

logo

Department of Master of Computer Applications, Institute Name, Address, Place, Pincode.
2023-24

Master of Computer Applications

SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY- TUMAKURU
(A constituent College of Siddhartha Academy of Higher Education, Tumakuru)

(Inner Title Page)

PROJECT TITLE

A Dissertation submitted in partial fulfillment of the requirements for the award of degree of
MASTER OF COMPUTER APPLICATIONS

Of

Sri Siddhartha Institute of Technology
(A constituent College of Sri Siddhartha Academy of Higher Education, Tumkur)

STUDENT NAME
(USN Number)

Under the Guidance of

Internal Guide:
Guide Name
Affiliation
Address
Email:

External Guide:
Name
Affiliation/
Address
Email:

logo

Department of Master of Computer Applications, Institute Name, Address, Place, Pin code.
2023-24

Master of Computer Applications

SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY- TUMAKURU
(A constituent College of Siddhartha Academy of Higher Education, Tumakuru)

(Certificate)

INSTITUTE NAME

LOGO

Department of Master of Computer Applications, Institute Name
Address

CERTIFICATE

This is to Certify that **Student Name** bearing **USN: …….***has completed his/her final semester project work entitled* **"******"** *as a partial fulfillment for the award of Master of Computer Applications degree, during the academic year 2023-24 under my (our joint) supervision.*

Signature of Internal Guide
Guide Name
Affiliation
Address

Signature of HOD
HOD Name
Affiliation
Address

Head of the Dept.

Principal

Master of Computer Applications

Declaration

I, <**Name of student**>, student of 4th MCA, <**College Name**>, bearing USN **<USN of student>**hereby declare that the project entitled <**Project Title**> has been carried out by me under the supervision of External Guide /(or Guide) **<Name of the Guide>**, <**Designation of Guide**> and Internal Guide (or Co-guide) <**Name of the Guide>,** <**Designation of Guide**> and submitted in partial fulfillment of the requirements for the award of the Degree of Master of Computer Applications by the **Sri Siddhartha Institute of Technology** during the academic year 2023-24. This report has not been submitted to any other Organization/University for any award of degree or certificate.

Name:

Signature:

Master of Computer Applications