



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	IOT DATA ANALYTICS	L	T	P	C
		3	0	0	3

Course Objectives:

- To learn the concepts of big data analytics
- To learn the concepts about Internet of things
- To understand and implement smart systems

Course Outcomes:

- Understand the different types of Big Data platforms
- Familiar with the fog computing concepts
- Understanding the cloud computing concepts

UNIT-I

BIG DATA PLATFORMS FOR THE INTERNET OF THINGS

Big Data Platforms for the Internet of Things: network protocol- data dissemination –current state of art- Improving Data and Service Interoperability with Structure, Compliance, Conformance and Context Awareness: interoperability problem in the IoT context- Big Data Management Systems for the Exploitation of Pervasive Environments - Big Data challenges and requirements coming from different Smart City applications

UNIT-II

RFID FALSE AUTHENTICATIONS: On RFID False Authentications: YA TRAP – Necessary and sufficient condition for false authentication prevention - Adaptive Pipe lined Neural Network Structure in Self-aware Internet of Things: self-healing systems- Role of adaptive neural network-Spatial Dimensions of Big Data: Application of Geographical Concepts and Spatial Technology to the Internet of Things- Applying spatial relationships, functions, and models

UNIT-III

FOG COMPUTING :Fog Computing: A Platform for Internet of Things and Analytics: massively distributed number of sources - Big Data Metadata Management in Smart Grid semantic inconsistencies – role of metadata



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

UNIT-IV

WEB ENHANCED BUILDING : Toward Web Enhanced Building Automation System heterogeneity between existing installations and native IP devices - loosely-coupled Web protocol stack –energy saving in smart building- Intelligent Transportation Systems and Wireless Access Vehicular Environment Technology for Developing Smart Cities: advantages and achievement Emerging Technologies in Health Information Systems: Genomics Driven Wellness Tracking and Management System (GO-WELL) – predictive care –personalized medicine

UNIT-V

SUSTAINABILITY DATA AND ANALYTICS : Sustainability Data and Analytics in Cloud-Based M2M Systems – potential stakeholders and their complex relationships to data and analytical applications – Social Networking Analysis - Building a useful understanding of a social network Leveraging Social Media and IoT to Bootstrap Smart Environments : lightweight Cyber Physical Social Systems - citizen actuation

Text Books:

1. Stackowiak, R., Licht, A., Mantha, V., Nagode, L., "Big Data and The Internet of Things Enterprise Information Architecture for A New Age", Apress, 2015.
2. Dr. John Bates , "Thingalytics - Smart Big Data Analytics for the Internet of Things", John Wiley & Sons, 2015.6) Web Hosting for Dummies, Peter Pollock, John Wiley Brand

Reference Books:

1. David Hanes, Gonzalo Salgueiro, Patrick Grossete, Rob Barton and Jerome Henry, "IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things", Cisco Press, 2017
2. Olivier Hersent, David Boswarthick ,OmarElloum,"The Internet of Things–Key applications and Protocols", Wiley,2012.
3. Michael Miller,"The Internet of Things",Pearson Education,2015.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	CLOUD COMPUTING	L	T	P	C
		3	0	0	3

Course Objectives:

- To explain the evolving utility computing model called cloud computing.
- To introduce the various levels of services offered by cloud.
- To discuss the fundamentals of cloud enabling technologies such as distributed computing, service-oriented architecture and virtualization.
- To emphasize the security and other challenges in cloud computing.
- To introduce the advanced concepts such as containers, serverless computing and cloud-centric Internet of Things.

UNIT-I

Introduction to Cloud Computing Fundamentals: Cloud computing at a glance, defining a cloud, cloud computing reference model, types of services (IaaS, PaaS, SaaS), cloud deployment models (public, private, hybrid), utility computing, cloud computing characteristics and benefits, cloud service providers (Amazon Web Services, Microsoft Azure, Google AppEngine).

UNIT-II

Cloud Enabling Technologies: Ubiquitous Internet, parallel and distributed computing, elements of parallel computing, hardware architectures for parallel computing (SISD, SIMD, MISD, MIMD), elements of distributed computing, Inter-process communication, technologies for distributed computing, remote procedure calls (RPC), service-oriented architecture (SOA), Web services, virtualization.

UNIT-III

Virtualization and Containers: Characteristics of virtualized environments, taxonomy of virtualization techniques, virtualization and cloud Computing, pros and cons of virtualization, technology examples (XEN, VMware), building blocks of containers, container platforms (LXC, Docker), container orchestration, Docker Swarm and Kubernetes, public cloud VM (e.g. Amazon EC2) and container (e.g. Amazon Elastic Container Service) offerings.

UNIT-IV

Cloud computing challenges: Economics of the cloud, cloud interoperability and standards, scalability and fault tolerance, energy efficiency in clouds, federated clouds, cloud computing security, fundamentals of computer security, cloud security architecture, cloud shared responsibility model, security in cloud deployment models.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

UNIT-V

Advanced concepts in cloud computing : Serverless computing, Function-as-a-Service, serverless computing architecture, public cloud (e.g. AWS Lambda) and open-source (e.g. OpenFaaS) serverless platforms, Internet of Things (IoT), applications, cloud-centric IoT and layers, edge and fog computing, DevOps, infrastructure-as-code, quantum cloud computing.

Text Books:

1. Mastering Cloud Computing, 2nd edition, RajkumarBuyya, Christian Vecchiola, ThamaraiSelvi, ShivanandaPoojara, Satish N. Srirama, Mc Graw Hill, 2024.
2. Distributed and Cloud Computing, Kai Hwang, Geoffery C. Fox, Jack J. Dongarra, Elsevier, 2012.

Reference Books:

1. Cloud Computing, Theory and Practice, Dan C Marinescu, 2nd edition, MK Elsevier, 2018.
2. Essentials of cloud Computing, K. Chandrasekhran, CRC press, 2014.
3. Online documentation and tutorials from cloud service providers (e.g., AWS, Azure, GCP)



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	MACHINE LEARNING	L	T	P	C
		3	0	0	3

Course Objectives:

The objectives of the course is to

- Define machine learning and its different types (supervised and unsupervised) and understand their applications.
- Apply supervised learning algorithms including decision trees and k-nearest neighbours (k-NN).
- Implement unsupervised learning techniques, such as K-means clustering.

Course Outcomes: At the end of the course, student will be able to

- Enumerate the Fundamentals of Machine Learning
- Build Nearest neighbour based models
- Apply Models based on decision trees and Bayes rule
- Make use of Linear discriminants for machine Learning
- Choose appropriate clustering technique

UNIT-I

Introduction to Machine Learning: Evolution of Machine Learning, Paradigms for ML, Learning by Rote, Learning by Induction, Reinforcement Learning, Types of Data, Matching, Stages in Machine Learning, Data Acquisition, Feature Engineering, Data Representation, Model Selection, Model Learning, Model Evaluation, Model Prediction, Search and Learning, Data Sets.

UNIT-II

Nearest Neighbor-Based Models: Introduction to Proximity Measures, Distance Measures, Non-Metric Similarity Functions, Proximity Between Binary Patterns, Different Classification Algorithms Based on the Distance Measures ,K-Nearest Neighbor Classifier, Radius Distance NearestNeighbor Algorithm, KNN Regression, Performance of Classifiers, Performance of Regression Algorithms.

UNIT-III

Models Based on Decision Trees: Decision Trees for Classification, Impurity Measures, Properties, Regression Based on Decision Trees, Bias–Variance Trade-off, Random Forests for Classification and Regression.
The Bayes Classifier: Introduction to the Bayes Classifier, Bayes' Rule and Inference, The Bayes Classifier and its Optimality, Multi-Class Classification | Class Conditional Independence and Naive Bayes Classifier (NBC)



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

UNIT-IV

Linear Discriminants for Machine Learning: Introduction to Linear Discriminants, Linear Discriminants for Classification, Perceptron Classifier, Perceptron Learning Algorithm, Support Vector Machines, Linearly Non-Separable Case, Non-linear SVM, Kernel Trick, Logistic Regression, Linear Regression, Multi-Layer Perceptrons (MLPs), Backpropagation for Training an MLP.

UNIT-V

Clustering :Introduction to Clustering, Partitioning of Data, Matrix Factorization | Clustering of Patterns, Divisive Clustering, Agglomerative Clustering, Partitional Clustering, K-Means Clustering, Soft Partitioning, Soft Clustering, Fuzzy C-Means Clustering, Rough Clustering, Rough K-Means Clustering Algorithm, Expectation Maximization-Based Clustering, Spectral Clustering.

Text Books:

- 1.“Machine Learning Theory and Practice”, M N Murthy, V S Ananthanarayana, Universities Press (India), 2024

Reference Books:

- 1.“Machine Learning”, Tom M. Mitchell, McGraw-Hill Publication, 2017
- 2.“Machine Learning in Action”, Peter Harrington, DreamTech
- 3.“Introduction to Data Mining”, Pang-Ning Tan, Michel Stenbach, Vipin Kumar, 7th Edition, 2019.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	DEVOPS	L	T	P	C
		3	0	0	3

Course Objectives:

- Describe the agile relationship between development and IT operations.
- Understand the skill sets and high-functioning teams involved in DevOps and related methods to reach a continuous delivery capability.
- Implement automated system update and DevOps lifecycle.

UNIT-I

Introduction to DevOps: Introduction to SDLC, Agile Model. Introduction to Devops. DevOps Features, DevOps Architecture, DevOps Lifecycle, Understanding Workflow and principles, Introduction to DevOps tools, Build Automation, Delivery Automation, Understanding Code Quality, Automation of CI/ CD. Release management, Scrum, Kanban, delivery pipeline, bottlenecks, examples

UNIT-II

Source Code Management (GIT): The need for source code control, The history of source code management, Roles and code, source code management system and migrations. What is Version Control and GIT, GIT Installation, GIT features, GIT workflow, working with remote repository, GIT commands, GIT branching, GIT staging and collaboration. **UNIT- TESTING - CODE COVERAGE:** JUNIT-, nUNIT-& Code Coverage with Sonar Qube, SonarQube - Code Quality Analysis.

UNIT-III

Build Automation - Continuous Integration (CI): Build Automation, What is CI Why CI is Required, CI tools, Introduction to Jenkins (With Architecture), jenkins workflow, jenkins master slave architecture, Jenkins Pipelines, PIPELINE BASICS - Jenkins Master, Node, Agent, and Executor Freestyle Projects & Pipelines, Jenkins for Continuous Integration, Create and Manage Builds, User Management in Jenkins Schedule Builds, Launch Builds on Slave Nodes.

UNIT-IV

Continuous Delivery (CD): Importance of Continuous Delivery, CONTINUOUS DEPLOYMENT CD Flow, Containerization with Docker: Introduction to Docker, Docker installation, Docker commands, Images & Containers, DockerFile, Running containers, Working with containers and publish to Docker Hub.

Testing Tools: Introduction to Selenium and its features, JavaScript testing.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

UNIT-V

Configuration Management - ANSIBLE: Introduction to Ansible, Ansible tasks, Roles, Jinjatemplating, Vaults, Deployments using Ansible.

CONTAINERIZATION USING KUBERNETES(OPENSHIFT): Introduction to Kubernetes Namespace & Resources, CI/CD - On OCP, BC, DC &ConfigMaps, Deploying Apps on Openshift Container Pods. Introduction to Puppet master and Chef.

Text Books:

1. Joyner, Joseph., Devops for Beginners: Devops Software Development Method Guide for Software Developers and It Professionals, 1st Edition MihailsKonoplows, 2015.
2. Alisson Machado de Menezes., Hands-on DevOps with Linux, 1st Edition, BPB Publications, India, 2021.

Reference Books:

1. Len Bass, Ingo Weber, Liming Zhu. DevOps: A Software Architect's Perspective. Addison Wesley; ISBN-10
2. Gene Kim Je Humble, Patrick Debois, John Willis. The DevOps Handbook, 1st Edition, IT Revolution Press, 2016.
3. Verona, Joakim Practical DevOps, 1stEdition, Packt Publishing, 2016.
4. Joakim Verona. Practical Devops, Ingram short title; 2ndedition (2018). ISBN10: 1788392574
5. Deepak Gaikwad, Viral Thakkar. DevOps Tools from Practitioner's Viewpoint. Wiley publications. ISBN: 9788126579952



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	IOT SECURITY	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES

- To learn about the security issues in IoT and cloud computing.
- To learn about the cryptography solutions and issues in IoT.
- To learn about the security measures taken in IoT and Cloud systems to improve security.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1- Understand the fundamental security issues in Internet of things.

CO2- Demonstrate different Frameworks and Hardware Architecture of IoT device.

CO3- Analyze different IoT Protocols and Layer Functioning.

CO4- Protect and secure the network connecting IoT devices to back-end systems on the internet.

CO5- Demonstrate different authentication mechanism such as digital certificates, biometrics, etc.

CO6- Demonstrate collecting, aggregating, monitoring, and normalizing data from IoT devices and providing actionable reporting and alerting on specific activities or when activities fall outside established policies.

UNIT-I

FUNDAMENTALS OF IOT ECOSYSTEM

IoT security issues, how to design an IoT system, Hardware, software and network security related to IoT systems - Basics of cryptographic solutions to IoT systems.

UNIT-II

OVERVIEW OF CLOUD COMPUTING AND ITS SERVICES

Cloud Computing Fundamental: Cloud computing definition, private, public and hybrid cloud. Cloud types; IaaS, PaaS, SaaS.

UNIT-III

CHALLENGES IN CLOUD COMPUTING

Benefits and challenges of cloud computing - Public vs. Private clouds, Role of virtualization in enabling the cloud.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

UNIT-IV

SECURITY CONCEPTS IN CONTEXT TO IoT DEVICES

Security Concepts, Confidentiality, privacy, integrity, authentication, non-repudiation, Virtualization

UNIT-V IoT SECURITY THREATS AND COUNTERMEASURES

System-Specific Attacks: Guest hopping, attacks on the VM (delete the VM, attack on the control of the VM, code or file injection into the virtualized file structure), VM migration attack, hyper jacking.

Text/Reference Books:

1. David Etter, "IoT Security: Practical guide book "Create Space, 1st Edition, 2016.
2. Drew Van Duren, Brian Russell, "Practical Internet of Things Security", Packt, 1st Edition, 2016.
3. Sean Smith, "The Internet of Risky Things", O'Reilly Media, 1st Edition, 2017.
4. Brian Russell, Drew Van Duren, "Practical Internet of Things Security: Design a security framework for an Internet connected ecosystem", 2nd Edition, 2018.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	MULTI AGENT SYSTEMS	L	T	P	C
		3	0	0	3

Course Objectives:

By the end of this course, students will be able to:

- Understand the fundamental concepts of agents, agent-based systems, and their applications.
- Analyze and design intelligent agent architectures.
- Explore multi-agent interactions, coordination, and communication mechanisms.
- Understand multi-agent decision-making, game-theoretic principles, and computational social choice.
- Apply logical foundations and practical approaches to multi-agent resource allocation and negotiation.

UNIT-I

Introduction to Agent Systems: what is an agent? agents and objects; agents and expert systems; agents and distributed systems; typical application areas for agent systems

UNIT-II

Intelligent Agents: Abstract Architectures for Agents, Tasks for Agents, Designing Intelligent Agents, Reasoning Agents, Reactive Agents, Hybrid Agents, Layered Agents.

UNIT-III

Multi-Agent Systems and Communication: Ontologies: OWL, KIF, RDF. Interaction Languages and Protocols, Speech Acts, KQML/KIF, The FIPA Framework. Cooperation in Multi-Agent Systems- Cooperative Distributed Problem Solving (CDPS), Partial Global Planning, Coherence and Coordination, Applications of Multi-Agent Systems.

UNIT-IV

Multi-Agent Decision-Making: Multi-Agent Interactions and Solution Concepts-Nash Equilibria (Pure and Mixed Strategies), Pareto Efficiency, Cooperative vs. Non-Cooperative Strategies, Zero-Sum and Other Interactions. Cooperation Models- The Prisoner's Dilemma and Axelrod's Experiments, Program Equilibria. Computational Social Choice-Voting Protocols, Arrow's Theorem, Gibbard-Satterthwaite Theorem, Strategic Manipulation and Complexity Prevention. Coalition Formation-The Core, The Shapley Value, Coalition Structure Generation.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

UNIT-V

Resource Allocation, Bargaining, and Logical Foundations: Allocating Scarce Resources, Auction Types (English, Dutch, Vickrey), Combinatorial Auctions and Winner Determination, The VCG Mechanism, Bargaining Strategies- The Alternating Offers Protocol, Task-Oriented Negotiation, Resource Allocation via Bargaining. Logical Foundations of Multi-Agent Systems- Modal Logics for Epistemic Reasoning, Reasoning about Mental States, Cooperation Logics and Their Applications, Model Checking and Verification.

Textbooks:

1. **Michael Wooldridge** – An Introduction to Multi-Agent Systems, Wiley, 2009.
2. **Yoav Shoham, Kevin Leyton-Brown** – Multiagent Systems: Algorithmic, Game-Theoretic, and Logical Foundations, Cambridge University Press, 2009.

Reference Books:

1. **Stuart Russell, Peter Norvig** – Artificial Intelligence: A Modern Approach, Pearson, 3rd Edition, 2015.
2. **Gerhard Weiss** – Multiagent Systems: A Modern Approach to Distributed Artificial Intelligence, MIT Press, 2000.
3. **Jeffrey S. Rosenschein, Michael Wooldridge** – Reasoning About Rational Agents, MIT Press, 2000.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	AUTOMATA THEORY & COMPILER DESIGN	L	T	P	C
		3	0	0	3

Course Outcomes

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

- CO1.** Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation
- CO2.** Design and develop lexical analyzers, parsers and code generators
- CO3.** Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.
- CO4.** Acquire fundamental understanding of the structure of a Compiler and Apply concepts automata theory and Theory of Computation to design Compilers
- CO5.** Design computations models for problems in Automata theory and adaptation of such model in the field of compilers

UNIT- I

Introduction to Automata Theory:Central Concepts of Automata theory, Deterministic Finite Automata(DFA), Non- Deterministic Finite Automata(NFA) ,Epsilon- NFA, NFA to DFA Conversion, Minimization of DFA. **Introduction to Compiler Design:**Language Processors, Phases of Compilers

UNIT-II

Regular Expressions and Languages:Regular Expressions, Finite Automata and Regular Expressions, Proving Languages Not to Be Regular. **Lexical Analysis Phase of compiler Design:**Role of Lexical Analyzer, Input Buffering, Specification of Token, Recognition of Token.

UNIT-III

Context Free Grammars:Definition and designing CFGs, Derivations Using a Grammar, Parse Trees, Ambiguity and Elimination of Ambiguity, Elimination of Left Recursion, Left Factoring.**Syntax Analysis Phase of Compilers:part-1:**Role of Parser , Top-Down Parsing

UNIT- IV

Push Down Automata:Definition of the Pushdown Automata, The Languages of a PDA.

Syntax Analysis Phase of Compilers:Part-2: Bottom-up Parsing, Introduction to LR Parsing: SLR, More Powerful LR parsers

UNIT-V

Introduction to Turing Machine:Problems that Computers Cannot Solve, The Turing machine, problems, Programming Techniques for Turing Machine, Extensions to the Basic Turing Machine**Undecidability :**A language That Is Not Recursively Enumerable, An Undecidable Problem That Is RE.**Other Phases of**



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

Compilers:Syntax Directed Translation- Syntax-Directed Definitions, Evaluation Orders for SDD's. Intermediate-Code Generation- Variants of Syntax Trees, Three-Address Code.**Code Generation**-Issues in the Design of a Code Generator

Textbooks

1. John E Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, " Introduction to Automata Theory, Languages and Computation", Third Edition, Pearson.
2. Alfred V.Aho, Monica S.Lam,RaviSethi, Jeffrey D. Ullman, " Compilers Principles, Techniques and Tools", Second Edition,Perason.

Reference:

1. Elain Rich, "Automata,Computability and complexity", 1st Edition, Pearson Education,2018.
2. K.L.P Mishra, N Chandrashekaran , 3rd Edition , 'Theory of Computer Science",PHI,2012.
3. Peter Linz, "An introduction to Formal Languages and Automata ", 3rd Edition, Narosa Publishers,1998.
4. K Muneeswaran, "Compiler Design", Oxford University Press 2013.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	BLOCKCHAIN TECHNOLOGIES	L	T	P	C
		3	0	0	3

Course Objectives:

1. To learn the fundamentals of Block Chain and various types of block chain and consensus mechanism.
2. To understand public block chain system, Private block chain system and consortium block chain.
3. Able to know the security issues of blockchain technology.

UNIT-I

Fundamentals of Blockchain: Introduction, Origin of Blockchain, Blockchain Solution, Components of Blockchain, Block in a Blockchain, The Technology and the Future.

Blockchain Types and Consensus Mechanism: Introduction, Decentralization and Distribution, Types of Blockchain, Consensus Protocol.

Cryptocurrency: Bitcoin, Altcoin and Token: Introduction, Bitcoin and the Cryptocurrency, Cryptocurrency Basics, Types of Cryptocurrencies, Cryptocurrency Usage.

UNIT – II

Public Blockchain System: Introduction, Public Blockchain, Popular Public Blockchains, The Bitcoin Blockchain, Ethereum Blockchain.

Smart Contracts: Introduction, Smart Contract, Characteristics of a Smart Contract, Types of Smart Contracts, Types of Oracles, Smart Contracts in Ethereum, Smart Contracts in Industry.

UNIT-III

Private Blockchain System: Introduction, Key Characteristics of Private Blockchain, Private Blockchain, Private Blockchain Examples, Private Blockchain and Open Source, E-commerce Site Example, Various Commands (Instructions) in E-commerce Blockchain, Smart Contract in Private Environment, State Machine, Different Algorithms of Permissioned Blockchain, Byzantine Fault, Multichain.

Consortium Blockchain: Introduction, Key Characteristics of Consortium Blockchain, Need of Consortium Blockchain, Hyperledger Platform, Overview of Ripple, Overview of Corda.

Initial Coin Offering: Introduction, Blockchain Fundraising Methods, Launching an ICO, Investing in an ICO, Pros and Cons of Initial Coin Offering, Successful Initial Coin Offerings, Evolution of ICO, ICO Platforms.

UNIT-IV

Security in Blockchain: Introduction, Security Aspects in Bitcoin, Security and Privacy Challenges of Blockchain in General, Performance and Scalability, Identity Management and Authentication, Regulatory Compliance and Assurance, Safeguarding Blockchain Smart Contract (DApp), Security Aspects in Hyperledger Fabric.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

Applications of Blockchain: Introduction, Blockchain in Banking and Finance, Blockchain in Education, Blockchain in Energy, Blockchain in Healthcare, Blockchain in Real-estate, Blockchain in Supply Chain, The Blockchain and IoT. Limitations and Challenges of Blockchain.

UNIT– V

Blockchain Case Studies:

Case Study 1 – Retail,

Case Study 2 – Banking and Financial Services,

Case Study 3 – Healthcare,

Case Study 4 – Energy and Utilities.

Blockchain Platform using Python: Introduction, Learn How to Use Python Online Editor, Basic Programming Using Python, Python Packages for Blockchain.

Blockchain platform using Hyperledger Fabric: Introduction, Components of Hyperledger Fabric Network, Chain codes from Developer.ibm.com, Blockchain Application Using Fabric Java SDK.

Text book:

1. “Block chain Technology”, Chandramouli Subramanian, Asha A.George, Abhilash K A and Meena Karthikeyan , Universities Press.

Reference Books:

1. Blockchain Blue print for Economy, Melanie Swan, SPD Oreilly.
2. Blockchain for Business, Jai Singh Arun, Jerry Cuomo, Nitin Gauar, Pearson Addition Wesley



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	NATURAL LANGUAGE PROCESSING	L	T	P	C
		3	0	0	3

Course Objectives:

This course introduces the fundamental concepts and techniques of natural language processing (NLP).

- Students will gain an in-depth understanding of the computational properties of natural languages and the commonly used algorithms for processing linguistic information.
- The course examines NLP models and algorithms using both the traditional symbolic and the more recent statistical approaches.
- 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:

After completion of this course

- Demonstrate a given text with basic Language features
- To design an innovative application using NLP components
- Explain a rule based system to tackle morphology/syntax of a language
- To design a tag set to be used for statistical processing for real-time applications
- To compare and contrast the use of different statistical approaches for different types of NLP applications.

UNIT- I

INTRODUCTION: Origins and challenges of NLP – Language Modeling: Grammar-based LM, Statistical LM – Regular Expressions, Finite-State Automata – English Morphology, Transducers for lexicon and rules, Tokenization, Detecting and Correcting Spelling Errors, Minimum Edit Distance.

UNIT- II

WORD LEVEL ANALYSIS: Unsmoothed N-grams, Evaluating N-grams, Smoothing, Interpolation and Backoff – Word Classes, Part-of-Speech Tagging, Rule-based, Stochastic and Transformation-based tagging, Issues in PoS tagging – Hidden Markov and Maximum Entropy models.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

UNIT- III

SYNTACTIC ANALYSIS: Context-Free Grammars, Grammar rules for English, Treebanks, Normal Forms for grammar – Dependency Grammar – Syntactic Parsing, Ambiguity, Dynamic Programming parsing – Shallow parsing Probabilistic CFG, Probabilistic CYK, Probabilistic Lexicalized CFGs – Feature structures, Unification of feature structures

UNIT- IV

SEMANTICS AND PRAGMATICS: Requirements for representation, First-Order Logic, Description Logics – Syntax-Driven Semantic analysis, Semantic attachments – Word Senses, Relations between Senses, Thematic Roles, selectional restrictions – Word Sense Disambiguation, WSD using Supervised, Dictionary & Thesaurus, Bootstrapping methods – Word Similarity using Thesaurus and Distributional methods.

UNIT- V

DISCOURSE ANALYSIS AND LEXICAL RESOURCES: Discourse segmentation, Coherence – Reference Phenomena, Anaphora Resolution using Hobbs and Centering Algorithm – Coreference Resolution – Resources: Porter Stemmer, Lemmatizer, Penn Treebank, Brill's Tagger, WordNet, PropBank, FrameNet, Brown Corpus, British National Corpus (BNC).

Text Books:

1. Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, 2nd Edition, Daniel Jurafsky, James H. Martin - Pearson Publication,2014.
2. Natural Language Processing with Python, First Edition, Steven Bird, Ewan Klein and Edward Loper, O'Reilly Media,2009.

Reference Books:

1. Language Processing with Java and Ling Pipe Cookbook, 1st Edition, Breck Baldwin, Atlantic Publisher, 2015.
2. Natural Language Processing with Java, 2nd Edition, Richard M Reese, O'Reilly Media,2015.
3. Handbook of Natural Language Processing, Second, Nitin Indurkha and Fred J. Damerau, Chapman and Hall/CRC Press, 2010.Edition
4. Natural Language Processing and Information Retrieval, 3rd Edition, Tanveer Siddiqui, U.S. Tiwary, Oxford University Press,2008.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	SECURITY ASSESSMENT AND RISK ANALYSIS	L	T	P	C
		3	0	0	3

Course Objectives:

1. The course takes a software development perspective to the challenges of engineering software systems that are secure.
2. This course addresses design and implementation issues critical to producing secure software systems.
3. The course deals with the question of how to make the requirements for confidentiality, integrity, and availability integral to the software development process.
4. Secure software requirements gathering to design, development, configuration, deployment, and ongoing maintenance
5. Security of enterprise information systems.

Course Outcomes:

1. Understand various aspects and principles of software security.
2. Devise security models for implementing at the design level.
3. Identify and analyze the risks associated with s/w engineering and use relevant models to mitigate the risks.
4. Understand the various security algorithms to implement for secured computing and computer networks
5. Explain different security frameworks for different types of systems including electronic systems.

UNIT-I

Defining computer security, the principles of secure software, trusted computing base, etc, threat modeling, advanced techniques for mapping security requirements into design specifications. Secure software implementation, deployment and ongoing management.

UNIT-II

Software design and an introduction to hierarchical design representations. Difference between high-level and detailed design. Handling security with high-level design. General Design Notions. Security concerns designs at multiple levels of abstraction, Design patterns, quality assurance activities and strategies that support early vulnerability detection, Trust models, security Architecture & design reviews .



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

UNIT-III

Software Assurance Model: Identify project security risks & selecting risk management strategies, Risk Management Framework, Security Best practices/ Known Security Flaws, Architectural risk analysis, Security Testing & Reliability (Penn testing, Risk- Based Security Testing

UNIT-IV

Security in Enterprise Business: Identification and authentication, Enterprise Information Security, Symmetric and asymmetric cryptography, including public key cryptography, data encryption standard (DES), advanced encryption standard (AES), algorithms for hashes and message digests. Authentication, authentication schemes , access control models, Kerberos protocol, public key infrastructure (PKI), protocols specially designed for e-commerce and web applications, firewalls and VPNs.

UNIT-V

Security development frameworks. Security issues associated with the development and deployment of information systems, including Internet-based e-commerce, e-business, and e-service systems.

Text Books:

1. W. Stallings, Cryptography and network security: Principles and practice, 5 th Edition, Upper Saddle River, NJ: Prentice Hall., 2011
2. C. Kaufman, r. Perlman, & M. Speciner, Network security: Private communication in a public world, 2 nd Edition, Upper Saddle River, NJ:PrenticeHall, 2002
3. C. P. Pfleeger, S. L. Pfleeger, Security in Computing, 4 th Edition, Upper Saddle River, NJ:Prentice Hall, 2007
4. T. M. Merkow, & J. Breithaupt, Information security: Principles and practices. Upper Saddle River, NJ:Prentice Hall, 2005

Reference Books:

1. Gary McGraw, Software Security: Building Security In, Addison-Wesley, 2006



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	ANDROID APPLICATION DEVELOPMENT	L	T	P	C
		3	0	0	3

Course Objectives: This course provides a thorough understanding of mobile platforms, including attack surfaces, risk landscape & more.

Course Outcomes:

1. Understand common mobile application security vulnerabilities.
2. Define the security controls of multiple mobile operating systems.
3. Understand and analyze Blue tooth technology.
4. Understand and analyze over view of SMSsecurity and Enterprise security.

UNIT-I

Top Mobile Issues and Development Strategies: Top Issues Facing Mobile Devices, PhysicalSecurity , Secure Data Storage (on Disk), Strong Authentication with Poor Keyboards , Multiple-UserSupport with Security, Safe Browsing Environment , Secure Operating Systems, Application Isolation, Information Disclosure, Virus, Worms, Trojans, Spyware, and Malware , Difficult Patching/Update Process, Strict Use and Enforcement of SSL, Phishing, Cross-Site Request Forgery(CSRF), Location Privacy/Security, In secure Device Drivers, Multi Factor Authentication,Tips for Secure Mobile Application Development.

UNIT-II

WAP and Mobile HTML Security WAP and Mobile HTML Basics, Authenticationon WAP/Mobile HTML Sites, Encryption, Application Attacks on Mobile HTML Sites, Cross-Site Scripting, SQL Injection,Cross-Site Request Forgery, HTTP Redirects, Phishing, Session Fixation, Non-SSL Login, WAP andMobile Browser Weaknesses, Lack ofHTTPOnly Flag Support, Lack of SECURE Flag Support, Handling Browser Cache, WAPLimitations.

UNIT-III

Bluetooth Security Overview of the Technology, History and Standards, Common Uses, Alternatives, Future, Bluetooth Technical Architecture, Radio Operation and Frequency, Bluetooth Network Topology , Device Identification , Modes of Operation , Bluetooth Stack ,Bluetooth Profiles, BluetoothSecurity Features , Pairing , Traditional Security Services in Bluetooth, Security “Non-Features” ,Threats to Bluetooth Devices and Networks, Bluetooth Vulnerabilities, Bluetooth Versions Prior to v1.2, Bluetooth Versions Prior to v2.1.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

UNIT-IV

SMS Security Overview of Short Message Service, Overview of Multimedia Messaging Service, Wireless Application Protocol (WAP), Protocol Attacks, Abusing Legitimate Functionality, Attacking Protocol Implementations, Application Attacks, iPhone Safari, Windows Mobile MMS, Motorola RAZRJPG Over flow, Walk throughs, Sending PDUs, Converting XML to WBXML.

UNIT-V

Enterprise Security on the Mobile OS Device Security Options, PIN, Remote, 346 Secure Local Storage, Apple iPhone and Keychain, Security Policy Enforcement, Encryption, Full Disk Encryption, E-mail Encryption, File Encryption, Application Sand boxing, Signing, and Permissions, ApplicationS and boxing, Application Signing, Permissions, Buffer Over flow Protection, Windows Mobile, iPhone, Android, BlackBerry, Security Feature Summary.

Text Book:

1. Mobile Application Security, Himanshu Dwivedi, Chris Clark, David Thiel, TATA McGraw Hill.

Reference Books:

1. Mobile and Wireless Network Security and Privacy, Kami S. Makki, et al, Springer.
2. Android Security Attacks Defenses, Abhishek Dubey, CRC Press.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	CLOUD COMPUTING LAB	L	T	P	C
		0	0	3	1.5

Course Objectives:

- To introduce the various levels of services offered by cloud.
- To give practical knowledge about working with virtualization and containers.
- To introduce the advanced concepts such as serverless computing and cloud simulation.

Course Outcomes: At the end of the course, the student should be able to

- Demonstrate various service types, delivery models and technologies of a cloud computing environment.
- Distinguish the services based on virtual machines and containers in the cloud offerings.
- Assess the challenges associated with a cloud-based application.
- Discuss advanced cloud concepts such as serverless computing and cloud simulation.
- Examine various programming paradigms suitable to solve real world and scientific problems using cloud services.

List of Experiments:

1. Lab on web services
2. Lab on IPC, messaging, publish/subscribe
3. Install VirtualBox/VMware Workstation with different flavours of Linux or windows OS on top of windows8 or above.
4. Install a C compiler in the virtual machine created using VirtualBox and execute Simple Programs.
5. Create an Amazon EC2 instance and set up a web-server on the instance and associate an IP address with the instance. In the process, create a security group allowing access to port 80 on the instance.
6. OR
7. Do the same with OpenStack
8. Install Google App Engine. Create a hello world app and other simple web applications using python/java.
9. Start a Docker container and set up a web-server (e.g. apache2 or Python based Flask micro web framework) on the instance. Map the host directory as a data volume for the container.
10. Find a procedure to transfer the files from one virtual machine to another virtual machine. Similarly, from one container to another container.
11. Find a procedure to launch virtual machine using trystack (Online Openstack Demo Version)
12. Install Hadoop single node cluster and run simple applications like word count.
13. Utilize OpenFaaS – Serverless computing framework and demonstrate basic event driven function invocation.
14. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

Text Books:

1. Mastering Cloud Computing, 2nd edition, RajkumarBuyya, Christian Vecchiola, ThamaraiSelvi, ShivanandaPoojara, Satish N. Srirama, McGraw Hill, 2024.
2. Distributed and Cloud Computing, Kai Hwang, Geoffery C. Fox, Jack J. Dongarra, Elsevier, 2012.

Reference Books:

1. Cloud Computing, Theory and Practice, Dan C Marinescu, 2nd edition, MK Elsevier, 2018.
2. Cloud Computing: Principles and Paradigms by RajkumarBuyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.
3. Online documentation and tutorials from cloud service providers (e.g. AWS, Google App Engine)
4. Docker, Reference documentation, <https://docs.docker.com/reference/>
5. OpenFaaS, Serverless Functions Made Simple, <https://docs.openfaas.com/>



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	IOT DATA ANALYTICS LAB	L	T	P	C
		0	0	3	1.5

Software Requirements:

1. **Hadoop:** <https://hadoop.apache.org/release/2.7.6.html>
2. **Java :**<https://www.oracle.com/java/technologies/javase/javase8u211-later-archive-downloads.html>
3. **Eclipse:** <https://www.eclipse.org/downloads/>

List of Experiments:

Experiment 1: Week 1, 2:

1. Implement the following Data structures in Java
a) Linked Lists b) Stacks c) Queues d) Set e) Map

Experiment 2: Week 3:

- 2.(i) Perform setting up and Installing Hadoop in its three operating modes:
Standalone, Pseudo distributed, Fully distributed
(ii) Use web based tools to monitor your Hadoop setup.

Experiment 3: Week 4:

3. Implement the following file management tasks in Hadoop:

- Adding files and directories
- Retrieving files
- Deleting files

Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.

Experiment 4: Week 5:

4. Run a basic Word Count MapReduce program to understand MapReduce Paradigm.

Experiment 5: Week 6:

5. Write a map reduce program that mines weather data.

Weather sensors collecting data every hour at many locations across the globe gather a large volume of log data, which is a good candidate for analysis with Map Reduce, since it is semi structured and record-oriented.

Experiment 6: Week 7:

6. Use MapReduce to find the shortest path between two people in a social graph.

Hint: Use an adjacency list to model a graph, and for each node store the distance from the original node, as well as a back pointer to the original node. Use the mappers to propagate the distance to the original node, and the reducer to restore the state of the graph. Iterate until the target node has been reached.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

Experiment 7: Week 8:

7. Implement Friends-of-friends algorithm in MapReduce.

Hint: Two MapReduce jobs are required to calculate the FoFs for each user in a social network. The first job calculates the common friends for each user, and the second job sorts the common friends by the number of connections to your friends.

Experiment 8: Week 9:

8. Implement an iterative PageRank graph algorithm in MapReduce.

Hint: PageRank can be implemented by iterating a MapReduce job until the graph has converged. The mappers are responsible for propagating node PageRank values to their adjacent nodes, and the reducers are responsible for calculating new PageRank values for each node, and for re-creating the original graph with the updated PageRank values.

Experiment 9: Week 10:

9. Perform an efficient semi-join in MapReduce.

Hint: Perform a semi-join by having the mappers load a Bloom filter from the Distributed Cache, and then filter results from the actual MapReduce data source by performing membership queries against the Bloom filter to determine which data source records should be emitted to the reducers.

Experiment 10: Week 11:

10. Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your

data.

Experiment 12: Week 12:

11. Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, functions, and indexes



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	SOFT SKILLS or IELTS	L	T	P	C
		0	1	2	2

Course Objectives:

- To encourage all-round development of the students by focusing on soft skills.
- To make the students aware of critical thinking and problem-solving skills.
- To develop leadership skills and organizational skills through group activities.
- To function effectively with heterogeneous teams.

Course Outcomes:

- Memorize various elements of effective communicative skills.
- Interpret people at the emotional level through emotional intelligence.
- Apply critical thinking skills in problem-solving.
- Analyze the needs of an organization for team building.
- Judge the situation and take necessary decisions as a leader.
- Develop social and work-life skills as well as personal and emotional well-being.

UNIT-I

Soft Skills & Communication Skills

Introduction, meaning, significance of soft skills – definition, significance, types of communication skills – Intrapersonal & Interpersonal skills – Verbal and Non-verbal Communication.

Activities:

- Intrapersonal Skills – Narration about self, strengths, and weaknesses – clarity of thought – self-expression – articulating with felicity.
- Interpersonal Skills – Group Discussion – Debate – Team Tasks – Book and film Reviews by groups – Group leader presenting views (non-controversial and secular) on contemporary issues or on a given topic.
- Verbal Communication – Oral Presentations – Extempore – Brief addresses and speeches – Convincing – Negotiating – Agreeing and disagreeing with professional grace.
- Non-verbal communication – Public speaking – Mock interviews – Presentations with an objective to identify non-verbal clues and remedy the lapses on observation.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

UNIT-II

Critical Thinking :Active Listening – Observation – Curiosity – Introspection – Analytical Thinking – Open-mindedness – Creative Thinking.

Activities:

- Gathering information and statistics on a topic – Sequencing – Assorting – Reasoning – Critiquing issues.
- Placing the problem – Finding the root cause – Seeking viable solutions – Judging with rationale – Evaluating the views of others – Case Study, Story Analysis.

UNIT-III

Problem Solving & Decision Making :Meaning & features of Problem Solving – Managing Conflict – Conflict resolution – Methods of decision-making – Effective decision-making in teams – Methods & Styles.

Activities:

- Placing a problem that involves conflict of interests, choice, and views – Formulating the problem – Exploring solutions by proper reasoning – Discussion on important professional, career, and organizational decisions and initiating debate on the appropriateness of the decision.
- Case Study & Group Discussion.

UNIT-IV

Emotional Intelligence & Stress Management:Managing Emotions – Thinking before Reacting – Empathy for Others – Self-awareness – Self-Regulation – Stress factors – Controlling Stress – Tips.

Activities:

- Providing situations for the participants to express emotions such as happiness, enthusiasm, gratitude, sympathy, confidence, and compassion in the form of written or oral presentations.
- Providing opportunities for the participants to narrate certain crisis and stress-ridden situations caused by failure, anger, jealousy, resentment, and frustration in the form of written and oral presentations.
- Organizing Debates.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

UNIT—V

Leadership Skills Team-Building – Decision-Making – Accountability – Planning – Public Speaking – Motivation – Risk-Taking – Time Management.

Activities:

- Forming groups with a consensus among the participants – Choosing a leader – Encouraging the group members to express views on leadership, democratic attitude, sense of sacrifice, sense of adjustment, vision, and accommodating nature.
- Eliciting views on successes and failures of leadership using the past knowledge and experience of the participants.
- Public Speaking, Activities on Time Management, Motivation, Decision Making, Group Discussion, etc.

Textbooks:

1. Personality Development and Soft Skills (English, Paperback, Mitra Barun K.), Publisher: Oxford University Press; Pap/Cdr edition (July 22, 2012).
2. Personality Development and Soft Skills: Preparing for Tomorrow, Dr. Shikha Kapoor, Publisher: IK International Publishing House; 0 edition (February 28, 2018).

Reference Books:

1. Soft Skills: Personality Development for Life Success by Prashant Sharma, BPB Publications, 2018.
2. Soft Skills by Alex K., Published by S. Chand.
3. Soft Skills: An Integrated Approach to Maximize Personality by Gajendra Singh Chauhan, Sangeetha Sharma, Published by Wiley.
4. Communication Skills and Soft Skills (Hardcover, A. Sharma), Publisher: Yking Books.
5. Soft Skills for a BIG IMPACT (English, Paperback, Renu Shorey), Publisher: Notion Press.
6. Life Skills (Paperback, English, Dr. Rajiv Kumar Jain, Dr. Usha Jain), Publisher: Vayu Education of India.

Online Learning Resources:

- https://youtu.be/DUIsNJtg2L8?list=PLLy_2iUCG87CQhELCytvXh0E_y-bOO1_q
- https://youtu.be/xBaLgJZ0t6A?list=PLzf4HHlsQFwJZel_j2PUy0pjVUgj7KIJ
- <https://youtu.be/-Y-R9hDl7IU>
- <https://youtu.be/gkLsn4ddmTs>
- <https://youtu.be/2bf9K2rRWwo>
- <https://youtu.be/FchfE3c2jzc>



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

III Year II Semester	TECHNICAL PAPERWRITING & IPR	L	T	P	C
		2	0	0	0

Course Objective : The course will explain the basic related to writing the technical reports and understanding the concepts related to formatting and structuring the report. This will help students to comprehend the concept of proofreading, proposals and practice

UNIT- I

Introduction: An introduction to writing technical reports, technical sentences formation, using transitions to join sentences, Using tenses for technical writing.

Planning and Structuring: Planning the report, identifying reader(s), Voice, Formatting and structuring the report, Sections of a technical report, Minutes of meeting writing.

UNIT- II

Drafting report and design issues: The use of drafts, Illustrations and graphics.

Final edits: Grammar, spelling, readability and writing in plain English: Writing in plain English, Jargon and final layout issues, Spelling, punctuation and Grammar, Padding, Paragraphs, Ambiguity.

UNIT- III

Proofreading and summaries: Proofreading, summaries, Activities on summaries. **Presenting final reports:** Printed presentation, Verbal presentation skills, Introduction to proposals and practice.

UNIT- IV

Using word processor:

Adding a Table of Contents, Updating the Table of Contents, Deleting the Table of Contents, Adding an Index, Creating an Outline, Adding Comments, Tracking Changes, Viewing Changes, Additions, and Comments, Accepting and Rejecting Changes , Working with Footnotes and Endnotes, Inserting citations and Bibliography, Comparing Documents, Combining Documents, Mark documents final and make them read only., Password protect Microsoft Word documents., Using Macros,

UNIT- V

Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of **Patenting and Development:** technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property

Text Books:

1. Kompal Bansal & Parshit Bansal, “Fundamentals of IPR for Beginner’s”, 1st Ed., BS Publications, 2016.
2. William S. Pfeiffer and Kaye A. Adkins, “Technical Communication: A Practical Approach”, Pearson.
3. Ramappa,T., “Intellectual Property Rights Under WTO”, 2nd Ed., S Chand, 2015.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA–533003, Andhra Pradesh, India

B.Tech CSE – Internet of Things (IoT)

(R23 – IIIrd YEAR COURSE STRUCTURE & SYLLABUS)

Reference Books:

1. Adrian Wallwork , English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2011.
2. Day R, How to Write and Publish a Scientific Paper, Cambridge University Press(2006)

E-resources:

1. <https://www.udemy.com/course/reportwriting/>
2. <https://www.udemy.com/course/professional-business-english-and-technical-report-writing/>
3. <https://www.udemy.com/course/betterbusinesswriting/>