G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous)

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Accredited by NBA (CIV, CSE, ECE & EEE) | Affiliated to JNTUA)
Nandikotkur Road, Venkayapalli (V), Kurnool - 518452, Andhra Pradesh

Department of Computer Science Engineering

Course Outcomes-R19

COURSE NAME	MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply the knowledge of managerial economics and financial accounting to solve business problems.
2	Analyze the demand, production cost and break even with suitable methods.
3	Classify the market structure to decide the fixation of suitable price.
4	Apply capital budgeting techniques to select best investment opportunity.
5	Prepare financial statements to assess financial health of business.

COURSE NAME	OBJECT ORIENTED PROGRAMMING THROUGH JAVA
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply object oriented concepts for solving general purpose problems
2	Use inheritance, user defined packages and interfaces for code reusability
3	Apply exception handling and multithreading concepts for robust and efficient applica-tion development
4	Implement collection frameworks to store and retrieve data efficiently
5	Build GUI applications using swings for user interface design

COURSE NAME	DATABASE MANAGEMENT SYSTEMS
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply suitable data model for given application
2	Construct optimized SQL queries to solve real time problems
3	Apply suitable normal form to eliminate data redundancy
4	Use suitable transaction model to avoid Deadlock
5	Choose appropriate index structure to improve performance

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COURSE NAME	SOFTWARE ENGINEERING
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Identify the phases of software development life cycle for better design
2	Apply different agile principles in developing a project
3	Adapt appropriate requirement engineering process for change management
4	Propose design as per functional and non-functional requirements using design principles
5	Implement various testing techniques for software systems

COURSE NAME	DISCRETE MATHEMATICS
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply the logic statements and connectives to solve real time problems
2	Classify algebraic structure and relations for a given mathematical problem
3	Analyze the basic results in combinatorics and binomial thermos for accuracy
4	Apply various recurrence relations to find solutions for numeric sequences
5	Apply graph theory techniques to solve network problems

COURSE NAME	OBJECT ORIENTED PROGRAMMING USING JAVA LABORATORY
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Design solutions for the problems of general purpose applications using objectoriented concepts.
2	Generate reusable code using inheritance, user defined packages and interface
3	Write robust and efficient code using exception handling and multithreading concepts
4	Implement collection frameworks and file handling techniques to store and retrieve data
5	Design user interface using swings

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COURSE NAME	DATABASE MANAGEMENT SYSTEMS LABORATORY
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Design Database tables for the given problem
2	Use appropriate querying processing technique to access the data
3	Apply suitable normal form to eliminate data redundancy
4	Develop PL/SQL routines for reusability of code
5	Apply appropriate triggering concepts for automation and performance

COURSE NAME	IOT AND ROBOTICS LABORATORY
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply concepts of Internet to Mobile Devices, Cloud and Sensor Networks
2	Analyze building blocks of Internet of Things and characteristics
3	Implement a Robot for a specific application
4	Compare various Servo and hardware components with Controller based projects
5	Develop small pervasive applications with the help of Robotics

COURSE NAME	QUANTITATIVE APTITUDE AND REASONING – I
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Identify the problems by applying mathematical fundamentals
2	Apply the suitable logical methods to solve the problems
3	Solve the various problems by using quantitative mathematical fundamentals
4	Analyse the comprehensive data with logical ability
5	

COURSE NAME	ENVIRONMENTAL SCIENCE
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Solve environmental problems through higher level of personal involvement and interest
2	Apply ecological morals to keep up amicable connection among nature and human beings
3	Recognize the interconnectedness of human dependence on the

	earth's ecosystems.
4	Apply environmental laws for the protection of environment and wildlife.
5	Influence society in proper utilization of goods and services.

COURSE NAME	FORMAL LANGUAGE AUTOMATA THEORY
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply knowledge of computing and mathematics appropriate to thediscipline.
2	Apply and solve Regular Expressions in Real Time Applications
3	Relate the concept of the grammar with the concept of programming language.
4	Design solutions for the problems related to Finite Automata, RE, CFG, PDA and TuringMachine.
5	Acquire a fundamental understanding of core concepts relating to the theory of com-putation and computational models including decidability and intractability.

COURSE NAME	WEB TECHNOLOGIES
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Construct a basic website using HTML and Cascading StyleSheets.
2	Build dynamic web page using Java Script objects and event handling mechanisms
3	Develop server side programs using Servlets and Java Server Page.
4	Construct web pages in PHP to represent data in XML format
5	Use AJAX and web services to develop interactive webapplications

COURSE NAME	DESIGN AND ANALYSIS OF ALGORITHMS
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Analyze the efficiency of algorithm for a given problem
2	Formulate the time order analysis for givenalgorithm.
3	Identify the mathematical techniques required to prove the time complexity of analgorithm.
4	Design appropriate algorithm to solve real world problems
5	Design and analysis to solve problems

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COURSE NAME	OPERATING SYSTEMS
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply the basic principles of Operating Systems in system programming
2	Apply the process synchronization concepts in multiprogramming environment
3	Solve the memory management problems with paging and segmentation techniques
4	Design algorithmic strategies to handle deadlock problems
5	Implement the concepts of secured file system for confidentiality and authentica-tion.

COURSE NAME	COMPUTER NETWORKS
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply the networking concepts in configuring the systems
2	Illustrates error handling mechanism in data link layer
3	Analyze the routing algorithms in finding the shortest path
4	Apply transport protocols in network communications
5	Implements domain name service and network security in the communicationsegment.

COURSE NAME	WEB TECHNOLOGIES LABORATORY
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Construct Web pages using HTML/XML and style sheets
2	Build dynamic web pages with validation using Java Script objects and by applying dif-ferent event handling mechanisms.
3	Develop dynamic web pages using server side scripting.
4	Use PHP programming to develop web applications.
5	Construct web applications using AJAX and webservices.

COURSE NAME	ALGORITHMS AND NETWORKS LABORATORY
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply basic programming techniques in solving given problem.
2	Design an algorithm for a given application program.
3	Utilize wrapper classes as per the demand of problem.
4	Apply the appropriate algorithmic technique for efficient problem solving.
5	Execute collection classes for dynamic programming.

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COURSE NAME	OPERATING SYSTEMS LABORATORY
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply appropriate CPU scheduling algorithm for the given problem
2	Perform resource management for optimal utility of CPU.
3	Implement algorithms handling deadlock problems
4	Implement the concepts of secured file system for confidentiality and authentication.
5	Apply threading concepts to handle concurrency.

COURSE NAME	QUANTITATIVE APTITUDE AND REASONING – II
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Identify the problems by applying mathematical fundamentals.
2	Apply the suitable logical method to solve theproblems
3	Solve the various problems by using quantitative mathematical fundamentals.
4	Analyse the comprehensive data with logical ability.
5	

COURSE NAME	HUMAN VALUES & PROFESSIONAL ETHICS
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply human values and ethics in professional life
2	Develop the moral ideals to maintain good relationships withpeople
3	Solve environmental related problems by keeping health of human being into consid-eration
4	Make use of the fundamental rights and human rights in life for individual dignity
5	Build the sound health system both physically and mentally by practicing yoga, karate, sports etc

COURSE NAME	**CLOUD COMPUTING**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply the principles of business intelligence in the commercial segment
2	Make use of pre-processing techniques for data organization
3	Analyze the efficient problem state space search for a problem

4	Implement the appropriate AI techniques to solve uncertainty problems

COURSE NAME	DATA MINING
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply the principles of business intelligence in the commercial segment
2	Make use of pre-processing techniques for data organization
3	Implement association, clustering and rule based mining for Market based analysis
4	Analyze the data mining classification technique for data differentiation
5	Design the unsupervised clustering algorithms for data analysis
5	Apply AI techniques to solve real time problems

COURSE NAME	ARTIFICAL INTELLIGENCE
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply suitable search strategies in finding better solutions for a given problem
2	Analyze performance of an algorithm as per given parameters
3	Analyze the efficient problem state space search for a problem
4	Implement the appropriate AI techniques to solve uncertainty problems
5	Apply AI techniques to solve real time problems

COURSE NAME	**DISTRIBUTED DATABASES**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Analyze distributed database design to address architectural issues
2	Apply partitioning techniques to enhance data storage and security
3	Design various query processing strategies for query optimization
4	Develop a concurrent system for transaction management
5	Design parallel architecture to counter the failures of parallel databases

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COURSE NAME	**ENTERPRISE STORAGE SYSTEM**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Analyze the architecture of an intelligent storage system for rapid data accessing
2	Justify the implementation of storage solutions to enable business continuity
3	Apply Storage Area Network for virtualization
4	Design a storage solution based on organizations requirements
5	Provide StorageInfrastructure Virtualization for better storage management

COURSE NAME	**TCP/IP Protocol**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Analyze the layers of the OSI and TCP/IP for efficient data transmission.
2	Distinguish between reliable and unreliable protocols for interconnections in application level and networklevel
3	Design routing mechanisms for congestion avoidance
4	Apply buffer management techniques to enhance performance
5	Apply flow, error and congestion control mechanisms for efficient data transmission

COURSE NAME	ANGULAR
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply single-page application designs in developing web applications
2	Implement the type scripts layers for web applications
3	Build Angular forms for client interaction
4	Implement efficient Angular routings to protect components from unauthorized access
5	Design view components for chatting applications

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COURSE NAME	**CLOUD COMPUTING LABORATORY**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Develop and deploy applications for better cloud utility
2	Design web services for modern commercial applications
3	Analyze the performance, scalability, and availability of the underlying cloud technologies for business requirements
4	Implement software installation for utility of its applications
5	Compare various cloud computing platforms for better cloud services

COURSE NAME	**DATA MINING LABORATORY**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Execute data mining algorithms for extraction of appropriate datasets
2	Apply data pre-processing techniques on raw input data for data cleansing
3	Appraise the classification techniques on large datasets for differentiation
4	Apply the data mining algorithms to perform association rule mining and clustering tasks
5	Differentiate the outlier data from cluster data for statistical analysis

COURSE NAME	**ARTIFICIAL INTELLIGENCE LABORATORY**
COUSE OUTCOMES	After completion of the course, the learner will be able to:
1	Execute statistical problems to produce appropriate solutions
2	Categorize the problem forselection of an appropriate algorithm
3	Compare computational complexity of AI problems for better efficiency
4	Demonstrate various AI algorithms based on empirical and theoretical proofs for performance statistics
5	

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COURSE NAME	GENDER SENSITIZATION
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Develop a better understanding of important issues related to gender in contemporary India
2	Sensitize to basic dimensions of the biological, sociological, psychological and legal aspects of gender
3	Acquire insight into the gendered division of labour and its relation to politics and economics
4	Equip to work and live together as equals
5	Develop a sense of appreciation of women in all walks of life

COURSE NAME	MOBILE APPLICATION DEVELOPMENT
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Able to recognize the importance of knowledge on Android programming basics
2	Able to construct the various aspects of user interfaces.
3	Able to apply knowledge on displaying pictures, menus and data services
4	Able to develop application on content provider and messaging services.
5	Able to substitute on the fundamentals of location based services, and creating your own services

COURSE NAME	**Machine Learning**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Distinguish between, supervised, unsupervised and semi-supervised learning
2	Apply the opt machine learning strategy for any given problem
3	Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem
4	Design a system that uses the appropriate graph models of machine learning
5	Modify existing machine learning algorithms to improve classification efficiency

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COURSE NAME	COMPILER DESIGN
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Identify tokens in the source program using lexical analyzer technique
2	Develop top-down and bottom-up parsers for the given grammar
3	Construct type checking semantic rules using synthesized and inherited attributes
4	Develop optimized intermediate code using code optimization techniques
5	Generate target code using flow graph and DAG

COURSE NAME	**BIGDATA**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Analyze distributed programsfor formation of large scale clusters
2	Apply enabling techniques of Hadoop and Map Reduce for distributed processing
3	Assemble the components of Hadoop and its Eco-System for efficient data storage and processing
4	Develop Map-Reduce programs in Java for performing large scale data analysis
5	Apply K-means clustering and Mahout Techniques for efficient data analysis

COURSE NAME	**PARALLEL ALGORITHMS**
COUSE OUTCOMES	
1	Design parallel random access machines algorithms for standard problems and applications
2	Analyze efficiency of different parallel algorithms
3	Choose the mapping on multi computers for efficient data processing. (Assess multiprocessors and multicomputer for efficient data processing).
4	Design the matrix algorithms to reduce complexity
5	Apply the graph algorithms to solve complex numeric problems

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COURSE NAME	NETWORKING ARCHITECTURE AND DESIGN
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply computer design and instruction set principles as per system requirement
2	Analyze system requirements to remove redundancy
3	Propose sub-netting and routing strategies in addressing architectural issues
4	Apply network management mechanisms for data security and privacy
5	Develop hybrid mechanisms for effective interconnection

COURSE NAME	DESIGN PATTERNS
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Apply basic programming techniques in solving given problem.
2	Design an algorithm for a given application program.
3	Utilize wrapper classes as per the demand of problem.
4	Apply the appropriate algorithmic technique for efficient problem solving.
5	Execute collection classes for dynamic programming.

COURSE NAME	MOBILE APPLICATION DEVELOPMENT LAB
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Able to acquire practical knowledge on Android programming.
2	Able to understand the implementation aspects of user interfaces
3	Able to understand the implementation of image view and persistent data services.
4	Able to acquire practical knowledge on messaging services
5	Able to understand the practical exposure on implementation of location based services.

COURSE NAME	MACHINE LEARNING LAB
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Distinguish between, supervised, unsupervised and semi-supervised learning
2	Apply the opt machine learning strategy for any given problem
3	Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem

4	Design a system that uses the appropriate graph models of machine learning
5	Modify existing machine learning algorithmsto improve classification efficiency

COURSE NAME	Professional English Communication Skills
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Achieve proficiency in English language skills
2	Build confidence through active listening, articulate expression and communication
3	Demonstrate the ability to play effective roles with multi-disciplinary teams
4	Apply language proficiency in professional contexts, mastering communication skills and adapting communication styles to diverse audience
5	Personality development of learners through enhanced communication skills and confidence
COURSE NAME	Indian Constitution
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Understand historical background of the constitution making and its importance for building a democratic India.
2	Explain the role of President and Prime Minister.
3	Understand the functioning of three wings of the government ie., executive, legislative and judiciary.
4	Understand the value of the fundamental rights and duties for becoming good citizen of India
5	Analyze the decentralization of power between central, state and local self-government.

COURSE NAME	NATURAL LANGUAGE PROCESSING
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Understand various phases in natural language processing.
2	Understand different linguistic resources software tools.
3	Understand parts of speech tagging with HMM, TBL.
4	Illustrate natural language grammar and context free grammar.
5	Understand applications of NLP and machine translation.

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COURSE NAME	**SOFTWARE TESTING**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Derive test cases for any given problem
2	Compare the different testing techniques to produce quality software
3	Identify the problem to its suitable testing model for error detection
4	Apply the appropriate technique for the design of data flow and integration of software
5	Create appropriate document for the software artifact

COURSE NAME	**CRYPTOGRAPHY AND NETWORK SECURITY**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Understand cryptography and network security concepts and application
2	Apply security principles to system design
3	Identify and investigate network security threat
4	Analyze and design network security protocols
5	Conduct research in network security

COURSE NAME	**SOFTWARE TESTING LABORATORY**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Identify the customer requirements for the given problem
2	Apply decision table testing for select problems
3	Derive different test cases for any given problem
4	Apply the appropriate testing technique for the design of flow graphs
5	Create software testing document for the software artifact

COURSE NAME	**DATA VISUALIZATION TECHNIQUES**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Make use of Tableau for effective communication of data.
2	Creae advanced visualizations, formatting and calculations using Tableau
3	Analyze changes in data visualization over time.
4	Create different types of dashboards.
5	Analyze and recommend effective business decisions/solutions using a systematic, evaluative, and information-based approach.

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COURSE NAME	**ADHOC SENSOR NETWORKS**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Introduce the concepts of Adhoc and Sensor Networks.
2	Explain Routing algorithms suitable for Adhoc Networks.
3	Understand the transport protocols for Adhoc networks
4	Familiarize with the security issues of adhoc and sensor networks
5	Adhoc and sensor networking, an emerging paradigm in computer networking that allows a logically centralized software program

COURSE NAME	**SOFTWARE DEFINED NETWORKS**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Benefits of SDN by the separation of data and control planes.
2	Interpret the SDN data plane devices and Open flow Protocols.
3	Implement the operation of SDN control plane with different controllers.
4	Apply techniques that enable applications to control the underlying
	network using SDN.
5	Describe Network Functions Virtualization components and their roles in SDN

COURSE NAME	**RESEARCH METHODOLOGY**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Understand basic concepts and its methodologies
2	Demonstrate the knowledge of research processes
3	Read. comprehend and explain research articles in their academic discipline
4	Analyze various types of testing tools used in research
5	Design a research paper without any ethical issues

COURSE NAME	**BLOCK CHAIN TECHNOLOGY**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Understand and explore the process of Block chain technology in payment and funding processing.
2	Analyze the working of Smart Contracts
3	Perform basic operations in hyper ledges and block chain networks.
4	Describe and deploy the smart contracts.
5	Identify the risks involved in building Block chain applications.

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COURSE NAME	**DEVOPS**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Analyze DevOps methodologies in collaboration with the Development and Operation s team
2	Apply configuration management strategies for better integrations and deployment
3	Make use of various DevOps tools to ease of collaboration and development
4	Determine the speed of productivity for in time delivery
5	Application deployment and configuration for uninterrupted usage

COURSE NAME	IMAGE PROCESSING
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Interpret fundamental concepts of digital and colour image
	processing.
2	Exemplify image enhancement.
3	Analyze the various terminologies involved in image segmentation like edge, boundary detection etc.
4	Summarize segmentation techniques for digital images
5	Assess image compression techniques for digital images.

COURSE NAME	**DESIGN THINKING**
COUSE OUTCOMES	**After completion of the course, the learner will be able to:**
1	Appreciate various design processesfor creativity and innovation
2	Develop design ideas through different techniques
3	Identify the significance of reverse engineering about products
4	Make use of design drawings to communicate ideas effectively
5	Build organizations thatsupport creative and innovative thinking