## Koneru Lakshmaiah Education Foundation (Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)

Accredited by NAAC as 'A++' ♦Approved by AICTE ♦ ISO 21001:2018 Certified Campus: Green Fields, Vaddeswaram - 522 302, Guntur District, Andhra Pradesh, INDIA. Phone No. +91 8645 - 350 200; www.klef.ac.in; www.klef.edu.in; www.kluniversity.in Admin Off: 29-36-38, Museum Road, Governorpet, Vijayawada - 520 002. Ph; +91 - 866 - 3500122, 2576129

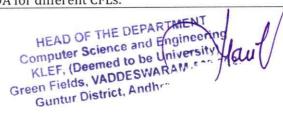
## **Department of Computer science and Engineering**

Program: B.Tech - CSE Academic Year: 2022-23

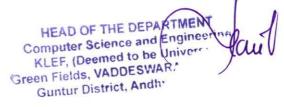
Course Code	Course Title	CO NO	Description of the Course Outcome			
		CO1	Understand the concepts of grammar to improve communication, reading, and writing skills			
22UC1101	INTEGRATED PROFESSIONAL	CO2	Demonstrate required knowledge over Dos and Don'ts of speaking in the corporate context. Demonstrate ability to face formal situations / interactions.			
	ENGLISH	CO3	Understand the varieties of reading and comprehend the tone and style of the author. Skim and scan effectively and appreciate rhetorical devices			
		CO4	Apply the concepts of writing to draft corporate letters, emails and memos			
		CO1	Identify and organize sentence structures based on grammar			
221162102	ESSENTIAL SKILLS	CO2	Illustrate specific writing styles			
22UC2103	FOR EMPLOYABILITY	C03	Relate intrapersonal skills			
	EMI EOTABIETT	CO4	Interpret interpersonal Skills for developing oral communication			
_	UNIVERSAL	CO1	Realize and Understand the basic aspiration, harmony in thehuman being.			
22UC3105	HUMAN VALUES & PROFESSIONAL	CO2	communication, reading, and writing skills  Demonstrate required knowledge over Dos and Don'ts of speaking in the corporate context. Demonstrate ability to face formal situations / interactions.  Understand the varieties of reading and comprehend the tone and style of the author. Skim and scan effectively and appreciate rhetorical devices  Apply the concepts of writing to draft corporate letters, emails and memos  Identify and organize sentence structures based on grammar  Illustrate specific writing styles  Relate intrapersonal skills  Interpret interpersonal Skills for developing oral communication  Realize and Understand the basic aspiration, harmony in thehuman being.  Envisage the roadmap to fulfill the basic aspiration of humanbeings.  Analyze the profession and his role in this existence  Understand the profession and his role in this existence  Demonstrating different interpersonal skills for employability.  Distinguishing Business essential skills  Classifying social media and corporate communication skills.  Applying analytical thinking skills.  Understand the importance of business correspondence and utilize proper format, content, and tools for improved results.  Apply the techniques of writing and use standardized business vocabulary in formal communication.  Understand the properties of numbers, solving the problems on divisibility rules, unit's digit, remainders, averages. Using the concept of Alligatios,			
	ETHICS	CO3	Analyze the profession and his role in this existence			
		CO4	Understand the profession and his role in this existence			
	2 1	CO1	Demonstrating different interpersonal skills for employability.			
22UC1202	ENGLISH	CO2				
22001202	PROFICIENCY	C03				
		CO4				
		C01	correspondence and utilize proper format, content, and tools for improved results.			
22UC2204	CORPORATE	CO2	Understand the concepts of grammar to improve communication, reading, and writing skills  Demonstrate required knowledge over Dos and Don'ts of speaking in the corporate context. Demonstrate ability to face formal situations / interactions.  Understand the varieties of reading and comprehend the tone and style of the author. Skim and scan effectively and appreciate rhetorical devices  Apply the concepts of writing to draft corporate letters, emails and memos  Identify and organize sentence structures based on grammar  Illustrate specific writing styles  Relate intrapersonal skills  Interpret interpersonal Skills for developing oral communication  Realize and Understand the basic aspiration, harmony in thehuman being.  Envisage the roadmap to fulfill the basic aspiration of humanbeings.  Analyze the profession and his role in this existence  Understand the profession and his role in this existence  Demonstrating different interpersonal skills for employability.  Distinguishing Business essential skills  Classifying social media and corporate communication skills.  Applying analytical thinking skills.  Understand the importance of business correspondence and utilize proper format, content and tools for improved results.  Apply the techniques of writing and use standardized business vocabulary in formal communication.  Understand the properties of numbers, solving the problems on divisibility rules, unit's digit remainders, averages. Using the concept of Alligatios			
	READINESS SKILLS -	C03	Understand the properties of numbers, solving the problems on divisibility rules, unit's digit, remainders, averages. Using the concept of Alligatios, solving the problems on mixtures, Understanding the			

HEAD OF THE DEPARTMENT Computer Science and Engineering
KLEF, (Deemed to be University)
Green Fields, VADDESWARAM-522 702.
Guntur District, Andhra Pradesh

Course Code	Course Title	CO NO	Description of the Course Outcome
			concept of surface areas and volumes, solving the 2D & 3D figures.
		CO4	Understand the three dimensions of a cube and answer questions PC)5 2 Based on the concept of 3-D rotation. Understand the concept of Binary Logic and the techniques
		CO1	Understanding the importance of Environmental education and conservation of natural resources
221100011	ECOLOGY &	CO2	Understanding the Ecosystems ,biodiversity and their
22UC0011	ENVIRONMENT	CO3	Understand global Environmental issues, pollution
		CO4	Understand the knowledge on solid waste management, disaster management and EIA process
	*	CO1	Students will have developed a better understanding of important issues related to gender in contemporary India
22UC0009	GENDER	CO2	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through group discussions.
	SENSITIZATION	CO3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
		CO4	Students will acquire insight into the gendered division of labour and its relation to politics and economics.
		CO1	Understand the basic concepts of XML, XSLT and JDBC
	ENTERPRISE	CO2	Develop Enterprise Application using Servlet and JSP
22CS2108	PROGRAMMING	CO3	Create an enterprise application using JSF and build business logic using EJB, JNDI and Session beans
	3	CO4	Apply JAX-RS, JMS and JAAS specifications to build web services
		CO 1	Understanding the basic algorithms for subsystem components
		CO	Classify and compare Memory and Process
	OPERATING	CO 3	Assess the requirements for Process synchronization and concurrency issues
22CS2109	SYSTEMS	CO 4	Evaluate various persistent storage technologies system protection and security, virtual machine, Network File System, Distributed File Systems, Real time OS
		CO 5	User System call creation in XV6 Operating System environment
22CS2215	AUTOMATA	CO 1	Make use of Finite State Machines for Modeling and Solving computing problems for different languages.
	AUTOMATA THEORY & FORMAL LANGUAGE	CO 2	Construct regular expressions for different languages.
	LANGUAGE	CO 3	Model Push Down Automata for CFLs and constructs a PDA for different CFLs.



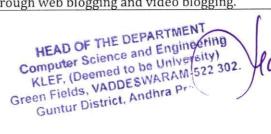
Course Code	Course Title	CO NO	Description of the Course Outcome			
		CO4	Make use of Context-Free languages and Turing Machines for different unrestricted languages.			
		CO1	Apply Object oriented paradigm for code reusability			
	COMPUTATIONAL	CO2	Design object-oriented solutions to the real-world problems through SOLID design principles.			
22SC1203	COMPUTATIONAL THINKING FOR OBJECT ORIENTED	CO3	Build Abstract Data Types by applying generic classes and java API.			
	DESIGN	CO4	Demonstrate Exception handling and String manipulation techniques			
		CO5	Develop a real time project by using object-oriented programming concepts.			
		CO1	with Clean coding Techniques.			
	ADVANCED OBJECT	CO2	oriented Programming.			
22CS2116	ORIENTED PROGRAMMING	CO3	methodologies in Object-oriented Programming			
	T ROGIGIAMING	CO4	PostgreSQL, Servlet & JSP			
		CO5	real-world problems.			
		CO1	Illustrate the functional components of DBMS and Design an ER Model for a database.			
		CO2	Implement SQL concepts and relational algebra.			
	DATABASE	CO3	Design object-oriented solutions to the real-world problems through SOLID design principles.  Build Abstract Data Types by applying generic classes and java API.  Demonstrate Exception handling and String manipulation techniques  Develop a real time project by using object-oriented programming concepts.  Apply Design Patterns & Test-Driven Development with Clean coding Techniques.  Understand the Collections & Generics over Object-oriented Programming.  Apply the various Concurrent Programming methodologies in Object-oriented Programming  Develop the applications using JDBC with PostgreSQL, Servlet & JSP  Analyze the various design techniques to solve any real-world problems.  Illustrate the functional components of DBMS and Design an ER Model for a database.  Design a relational model for a database & Implement SQL concepts and relational algebra.  Implement PL/SQL programs, normalization techniques, indexing to construct and access database  Analyze the importance of transaction Processing concurrency control and recovery techniques.  virtualization methods  Design a database and implement SQL queries and PL/SQL programs to do various operations on data.  Understand the software development life cycle and associated process models and Reverse Engineering.  Applying Requirement modeling and Agile and Extreme Programming, Other Agile Process Models  Examine Requirement Modeling, Agile Models such as Scrum, kanban and SAFe Methodology.  Categorize various Design Concepts, testing strategies, Test Driven Development and CMMI, Sit Sigma techniques  Develop UML Specification for software designs and programs  Apply error detection and correction mechanisms to			
22CS2110	MANAGEMENT SYSTEMS	CO4				
	**					
		2	Company of the first of the second of the se			
		C05	PL/SQL programs to do various operations on data.			
	0	CO 1				
		CO 2	Design a relational model for a database Implement SQL concepts and relational algebra.  Implement PL/SQL programs, normalization techniques, indexing to construct and access database  Analyze the importance of transaction Processing concurrency control and recovery techniques.  Virtualization methods  Design a database and implement SQL queries are PL/SQL programs to do various operations on data. Understand the software development life cycle are associated process models and Reverse Engineering Applying Requirement modeling and Agile are Extreme Programming, Other Agile Process Models Examine Requirement Modeling, Agile Models sugas Scrum, kanban and SAFe Methodology.  Categorize various Design Concepts, testing strategies, Test Driven Development and CMMI, Sigma techniques			
22CS2111	SOFTWARE ENGINEERING	CO 3				
	ENGINEERING	CO 4	strategies, Test Driven Development and CMMI, Six Sigma techniques			
		CO 5	programs			
22CS2212	COMPUTER NETWORKS & SECURITY	CO 1	Apply error detection and correction mechanisms to compute codewords for the source code and outline the working of OSI & TCP/IP reference models.			



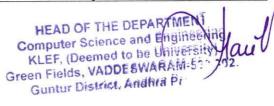
Course Code	Course Title	CO NO	Description of the Course Outcome		
		CO 2	Infer Channel allocation problem and algorithms to avoid it and compute the optimal path in a network using various static and dynamic routing algorithms.		
	- 1	CO 3	Identify the IP addresses of a network using IPV4 classful& classless addressing schemes and outline the functionalities of the transport layer like TCP Connection management and congestion control.		
		CO 4	Apply different symmetric and asymmetric encryption algorithms to compute ciphertext and identify the functionality of application layer protocols.		
		CO 1	Apply Uninformed search strategies and Heuristic Search techniques to solve well defined problems		
		CO 2	Apply optimization techniques to solve game playing and Constraint satisfaction problems		
22CS2213	AI FOR DATA SCIENCE	CO 3	Apply knowledge representation. to provide inference using resolution, forward and backward techniques.		
		CO 4	Analyze and visualize the real time data for AI applications		
		CO 5	Implement Problem solving , EDA techniques for AI applications		
		CO 1	Apply concepts of mathematics to find space and time complexities of various algorithms including string matching algorithms		
	DESIGN &	CO 2	Analyze and visualize the real time data for Al applications Implement Problem solving , EDA techniques for Al applications Apply concepts of mathematics to find space and time complexities of various algorithms including string matching algorithms Analyze the problems that can be solved by using Divide and Conquer and Greedy Method Analyze the problems that can be solved by using Dynamic Programming and Backtracking Analyze the problems that can be solved by using Branch and Bound and NP-Hard Graph problems Analyze the various design techniques to solve any		
22CS2214	ANALYSIS OF ALGORITHMS	CO 3	Analyze the problems that can be solved by using Dynamic Programming and Backtracking		
	e.	CO 4			
		CO 5	Analyze the various design techniques to solve any real-world problems.		
		CO1	Understand the software development life cycle and associated process models and Reverse Engineering.		
22CS4115	PARALLEL & DISTRIBUTED	C02	Illustrate Requirement modelling and Agile and Extreme Programming		
22031113	COMPUTING	CO3	Examine Agile Models such as Scrum, kanban and SAFe Methodology.		
		CO4	Categorize various testing strategies, Test Driven Development and CMMI, Six Sigma techniques		
22SC1101	COMPUTATIONAL	CO1	Design Basic and Complex Building Blocks for real world problems using structured programming paradigm		
	THINKING FOR STRUCTURED	CO2	Translate computational thinking into Logic Design for Solving real world problems		
	DESIGN	CO3	Apply and Analyse CRUD operations on Basic Data Structures using Asymptotic Notations		
	. 1	CO4	Apply and Analyse CRUD operations on Linear Data Structures using Asymptotic Notations.		

HEAD OF THE DEPARTMENT
Computer Science and Engineering
KLEF, (Deemed to be University
Green Fields, VADDESWARAY
Guntur District, And

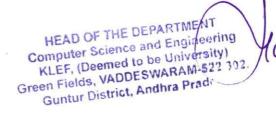
Course Code	Course Title	CO NO	Description of the Course Outcome			
		CO5	Apply the structured programming paradigm with logic building skills on Basic and Linear Data Structures for solving real world problems			
		C06	able to develop logic that help them to create programs as well as applications in C			
		CO1	Apply the structured programming paradigm with logic building skills on Basic and Linear Data Structures for solving real world problems  Skill the students in such a way that students will be able to develop logic that help them to create programs as well as applications in C  Understand the concept of Engineering Design Process, Visualize and complete his/her innovative design by final drafting using 3D modelling in Auto Desk Fusion 360  Understand the concept of web page, web browser, web server, and able to create Static webpages. Apply the HTML5 and CSS knowledge in building static web pages. Introduction to building social profiles through web blogging and video blogging.  Understand the concept of report writing using a markup language Latex. Build reports using Latex and apply templates and Bibliography in latex for various documentation purposes.  Understand the concept of data visualization and apply visualization techniques in creating data visualization dashboards with tools like Power BI.  To make the students to understand about the programming fundamentals of arduino software and tinkercard  To demonstrate the interfacing of Arduino UNO and ESP32 with LCD,LED,buzzer and Button  To design and configure the sensors with Ardunio UNO and ESP32 Boards  To design and configure the sensors with Ardunio UNO and ESP32 Boards and build Arduino and ESP32 based application  To acquaint the students about the fundamentals of Electronics  To understand Fundamentals of Internet of things  To demonstrate the Interfacing Arduino with LCD, LED, buzzer  To design and configure Arduino boards using sensors and & actuators  To build a small applications using Arduino for real time problems in the world  Understand the concept of Engineering Design Process, Visualize and complete his/her innovative design by final drafting using 3D modelling in Auto Desk Fusion 360  Understand the concept of web page, web browser, web server, and able to create Static webpages. Apply			
22EC1101	DIGITAL LOGIC & PROCESSORS	CO2	Understand the concept of web page, web browser, web server, and able to create Static webpages. Apply the HTML5 and CSS knowledge in building static web pages. Introduction to building social profiles through web blogging and video blogging.			
		C03	Understand the concept of report writing using a markup language Latex. Build reports using Latex and apply templates and Bibliography in latex for			
		CO4	Understand the concept of data visualization and apply visualization techniques in creating data visualization dashboards with tools like Power BI.			
		CO1	To make the students to understand about programming fundamentals of arduino software tinkercard			
	, om worken op	CO2	design by final drafting using 3D modelling in Auto Desk Fusion 360  Understand the concept of web page, web browser, web server, and able to create Static webpages. Apply the HTML5 and CSS knowledge in building static web pages. Introduction to building social profiles through web blogging and video blogging.  Understand the concept of report writing using a markup language Latex. Build reports using Latex and apply templates and Bibliography in latex for various documentation purposes.  Understand the concept of data visualization and apply visualization techniques in creating data visualization dashboards with tools like Power BI.  To make the students to understand about the programming fundamentals of arduino software and tinkercard  To demonstrate the interfacing of Arduino UNO and ESP32 with LCD,LED,buzzer and Button  To design and configure the sensors with Ardunio UNO and ESP32 Boards  To design and configure the sensors with Ardunio UNO and ESP32 Boards and build Arduino and ESP32 based application  To acquaint the students about the fundamentals of Electronics  To understand Fundamentals of Internet of things  To demonstrate the Interfacing Arduino with LCD, LED, buzzer  To design and configure Arduino boards using sensors and & actuators  To build a small applications using Arduino for real time problems in the world  Understand the concept of Engineering Design Process, Visualize and complete his/her innovative			
22SC1209	IOT WORKSHOP	C03	To design and configure the sensors with Ardunio UNO and ESP32 Boards			
	y.	CO4	To design and configure the sensors with Ardunio UNO and ESP32 Boards and build Arduino and ESP32 based application			
		C01	To acquaint the students about the fundamentals of Electronics			
		C02	To understand Fundamentals of Internet of things			
22EC1102	INTRODUCTION TO ELECTRONIC	C03	To demonstrate the Interfacing Arduino with LCD, LED, buzzer			
	SYSTEMS & IOT	C04				
		C05				
	DIGITAL TOOLS WORKSHOP	CO1				
22ME1103		CO2	Understand the concept of web page, web browser, web server, and able to create Static webpages. Apply the HTML5 and CSS knowledge in building static web pages. Introduction to building social profiles through web blogging and video blogging.			



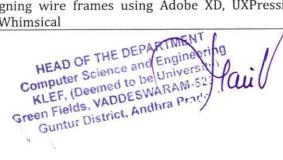
Course Code	Course Title	CO NO	Description of the Course Outcome		
	ž 0	CO3	Understand the concept of report writing using a markup language Latex. Build reports using Latex and apply templates and Bibliography in latex for various documentation purposes.		
		CO4	Understand the concept of data visualization and apply visualization techniques in creating data visualization dashboards with tools like Power BI.		
		C01	Understand the concept of report writing using a markup language Latex. Build reports using Latex and apply templates and Bibliography in latex for various documentation purposes.  Understand the concept of data visualization and apply visualization techniques in creating data visualization dashboards with tools like Power BI.  Apply measures of efficiency on algorithms and Analyze different Sorting Algorithms.  Analyze and compare stack ADT and queue ADT implementations using linked list and applications.  Analyze the linked implementation of Binary, Balanced Trees and different Hashing techniques.  Analyze different representations, traversals, applications of Graphs and Heap organization.  Develop and Evaluate common practical applications for linear and non-linear data structures.  Understand the functionality of CPU functional units-control unit, registers, the arithmetic and logic unit, instruction execution unit  Understand the concepts of CPU and the operation of main, cache and virtual memory organizations  Understand the concepts of the different types of I/O modules and I/O transfer techniques in computer modules  Apply the concept of pipelining in instruction execution and design issues of RISC, CISC and parallel computing architectures  Apply matrix algebra to the real-world applications in engineering, physical and biological sciences, computer science, finance, economics and solving the system of equations.  Apply basic and computational techniques on discrete structures like relations, orders, functions & FSM, Lattices, and propositional &predicate logic  Apply graph theory to solving real world structures and their related applications.  Apply Statistical methods to solving the real-world applications in Engineering science, Economics and Management.  Apply basic concepts of Aptitude and Reasoning to solve engineering and real world problems (Tests in skilling hours)  To understand the importance of probabilistic concepts in a wide spectrum of problems arising in engineering applied science.  T		
		CO2	Analyze and compare stack ADT and queue ADT implementations using linked list and applications.		
22SC1202	DESIGN OF DATA STRUCTURES	CO3	Analyze the linked implementation of Binary, Balanced Trees and different Hashing techniques.		
		CO4	applications of Graphs and Heap organization.		
	Ĭ	CO5	Develop and Evaluate common practical applications for linear and non-linear data structures.		
		CO1	Understand the functionality of CPU functional units - control unit, registers, the arithmetic and logic unit, instruction execution unit		
	COMPUTER	CO2	Understand the concepts of CPU and the operation of main, cache and virtual memory organizations		
22EC1202	ORGANIZATION & ARCHITECTURE	CO3	Understand the concepts of the different types of I/O modules and I/O transfer techniques in computer modules		
		C04	Apply the concept of pipelining in instruction execution and design issues of RISC, CISC and parallel computing architectures		
*	2	CO 1	Apply matrix algebra to the real-world applications in engineering, physical and biological sciences, computer science, finance, economics and solving the system of equations.		
	W. ()	CO 2	Apply basic and computational techniques on discrete structures like relations, orders, functions & FSM, Lattices, and propositional &predicate logic		
22MT1101	Mathematical for Computing	CO 3			
		CO 4	applications in Engineering science, Economics and Management.		
		CO 5			
	Drobability	CO 1	concepts in a wide spectrum of problems arising in engineering applied science.		
22MT2103	Probability, Statistics &Queueing Theory	CO 2	random processes using multivariate distribution functions.		
		CO 3	To understand the role of Statistical tests of significance in stochastic process		



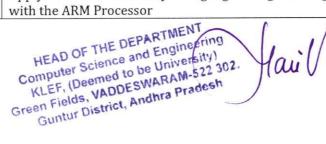
Course Code	Course Title	CO NO	Description of the Course Outcome
		CO 4	To formulate Stochastic process in terms of Markov chains and solve problems in queueing systems, and networks
		CO1	Able to understand the structure of crystalline solids, semiconductors physics and properties of light in Engineering application of Lasers.
220114101	QUANTUM PHYSICS	CO2	Able to understands the behavior of electrons on the microscopic level by using different quantum models
22PH4101	FOR ENGINEERS	CO3	Able to solve the time-independent Schrodinger wave equation as an intermediate step to solve the time-dependent Schrodinger wave equation.
		CO4	Able to explain the meaning and significance of the postulates of the special theory of relativity
		CO1	Understand how to enter these designs into an industry-standard design tool, OpticStudio by Zemax, to analyze and improve performance with powerful automatic optimization methods
0000110001	OPTICAL	CO2	Understand how to analyze these characteristics of your optical system using an industry-standard design tool, OpticStudio by Zemax
22PH4002M	ENGINEERING	CO3	Applying the mathematical tools required for analysis of high-performance systems are complicated enough that this course will rely more heavily on OpticStudio by Zemax.
		CO4	Understand the paraxial system design and optical resolution and efficiency with the introduction to real lenses and their imperfections
		CO1	Understand the energy band structures and their significance in electric properties of solids
22PH4002M	SEMICONDUCTOR	CO2	Analyzepn junction at equilibrium and under bias, capacitance and current characteristics, and breakdown behavior
	DEVICES	C03	Understand and analyze metal-oxide-semiconductor (MOS) device
		C04	Understand and analyze bipolar junction transistor (BJT)
		CO1	Predict potential complications from combining various chemicals or metals in an engineering setting
	CHEMISTRY FOR	CO2	Discuss fundamental aspects of electrochemistry and materials science relevant to corrosion phenomena
22CY1005	ENGINEERS	CO3	Classify water quality and select appropriate purification technique for intended problem
		CO4	Demonstrate the basic knowledge of instrumental methods and their applications in the structural analysis of materials
	Mathematical	CO 1	Apply various methods for finding the optimal solution of Linear Programming Problem.
22CS2204	Programming	CO 2	Apply Integer and Fractional programming approaches for solving discrete and concave optimization problems.



Course Code	Course Title	CO NO	Description of the Course Outcome		
		CO 3	Apply Combinatorial optimization techniques to build Approximation algorithms.		
		CO 4	programming, Mathematical Programming using Machine Learning concepts.		
		CO 1	Apply Combinatorial optimization techniques to build Approximation algorithms.  Understand Robust programming and constraint programming, Mathematical Programming using Machine Learning concepts.  Apply the concepts of mathematical principles besideslogic and identifying certain basic mathematical formulae to solve these kinds of problems  Formulate the concepts of mathematical principles of equations that contain the data related to real life situations which requires basic logic to analyze  Solve concepts of Venn diagrams and number patternsand illustrate logic behind connectives, series, and analogiesrespectively  Differentiate assumptions and arguments in critical reasoning  Understand the importance of Design thinking process for contextualized problems  Analyse, define, and ideate for solutions  Develop and test the prototype made  Explore the fundamentals of entrepreneurship skills for transforming the challenge into an opportunity  Implement problem solving ability through analyzing the given data and formulate solutions for real world problems based on time, travel, and wages  Determine the fundamental concepts of areas, volumes and derive solutions using simple mathematical principles besides interpreting the data through smart tricks to check the number analytics  Estimate inductive reasoning, to categorize the rulesset from a given list of observations and relate them to predict the conclusions according to the given conditions  Integrate verbal and non-verbal reasoning and to identify the logic behind the given arrangement based on the given conditions to bring out the possible outcome  Perceive and discuss about User Experience design process.  Recognize User Interface and differentiate from User Experience and principles of User Interface.  Focusing and distinguishing about Components of Uldesign process with Interactive Devices.		
22CS3106	Problem Solving Skills - 1	CO 2 equations that contain the data related to real situations which requires basic logic to analyze			
		CO 3	patternsand illustrate logic behind connectives, series, and analogiesrespectively		
		CO 4			
		CO 1	Understand the importance of Design thinking process for contextualized problems		
	Design Thinking for	CO 2			
20UC1203	Innovation	CO 3			
		CO 4	Explore the fundamentals of entrepreneurship skills		
		CO 1	Implement problem solving ability through analyzing the given data and formulate solutions for real world		
22CS3207	Problem Solving	CO 2	mathematical principles besides interpreting the data through smart tricks to check the number analytics		
22CS32U7	Skills - 2	CO 3	set from a given list of observations and relate them to predict the conclusions according to the given		
		CO 4	identify the logic behind the given arrangement based on the given conditions to bring out the		
		CO 1	Perceive and discuss about User Experience design		
		CO 2	Apply Combinatorial optimization techniques to build Approximation algorithms.  Understand Robust programming and constraint programming, Mathematical Programming using Machine Learning concepts.  Apply the concepts of mathematical principles besideslogic and identifying certain basic mathematical formulae to solve these kinds of problems  Formulate the concepts of mathematical principles of equations that contain the data related to real life situations which requires basic logic to analyze  Solve concepts of Venn diagrams and number patternsand illustrate logic behind connectives, series, and analogies respectively  Differentiate assumptions and arguments in critical reasoning  Understand the importance of Design thinking process for contextualized problems  Analyse, define, and ideate for solutions  Develop and test the prototype made  Explore the fundamentals of entrepreneurship skills for transforming the challenge into an opportunity  Implement problem solving ability through analyzing the given data and formulate solutions for real world problems based on time, travel, and wages  Determine the fundamental concepts of areas, volumes and derive solutions using simple mathematical principles besides interpreting the data through smart tricks to check the number analytics  Estimate inductive reasoning, to categorize the rulesset from a given list of observations and relate them to predict the conclusions according to the given conditions  Integrate verbal and non-verbal reasoning and to identify the logic behind the given arrangement based on the given conditions to bring out the possible outcome  Perceive and discuss about User Experience design process.  Recognize User Interface and differentiate from User Experience and principles of User Interface.  Focusing and distinguishing about Components of UI design process with Interactive Devices.  Determine graphic design techniques and psychology principles of User Experience		
22CS3064RA	UX DESIGN	CO 3	Focusing and distinguishing about Components of UI		
		CO 4			
		CO 5			



Course code Course Title NO	Description of the Course Outcome			
CO 1   1	Identify the Need of DevOps in SDLC and Cloud Infrastructure in DevOps, Apply Version Control System to track the latest version of Software			
CO 2 CONTINUOUS	Apply Continuous Integration and Continuous Deployment using Infrastructure as Code, Build in Cloud native Applications using Pipeline and Examine the Software and Automation Testing Frameworks.			
	Infrastructure in DevOps, Apply Version Control System to track the latest version of Software Apply Continuous Integration and Continuous Deployment using Infrastructure as Code, Build in Cloud native Applications using Pipeline and Examine the Software and Automation Testing Frameworks.  Analyze need of Containerization in SDLC and Examine the Kubernetes Pod Configuration.  Inspect Configuration Management using Infrastructure as Code, Analyze Continuous Monitoring and Container Orchestration process.  To Build and Inspect the Tools associated to DevOps Life Cycle.  Understand the various types of signals, systems and their frequency domain transformation.  Understand their realizations.  Apply signal processing approaches for extraction of information present in the natural signals.  Apply machine learning approaches for processing of signals.  Apply above signal processing approaches in tutorial problems related to transformation, filtering, feature extraction, machine learning for signal processing Understand IaaS Architectures and Implementation Guidelines. Apply on-demand compute services  Analyze applications and frameworks for data analysis and Content delivery in the cloud  Analyze Cloud Service Availability, Resiliency and dynamic scaling  Use Networking and security Services. Automate cloud Infrastructure, Deployment and Management Hands-On Cloud Administration. Implement monitor, and manage important cloud services and components including IaaS and PaaS  To Understand the Concept of Business Analytics in detail from domains perspective.  To analyze the application of R using Descriptive Statistics and Correlation concepts.  To analyze the application of Data Visualization techniques in Business Analytics using R.  To analyze the application of select Multivariate Analytical tools using R.  Understand C for Embedded Systems. Analyse ARM processor and interrupt architecture			
CO 4	Inspect Configuration Management using Infrastructure as Code, Analyze Continuous Monitoring and Container Orchestration process.			
(0.5)	Life Cycle.			
[ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [				
	filters and their realizations.			
22CS3116RA PROCESSING	System to track the latest version of Software Apply Continuous Integration and Continuous Deployment using Infrastructure as Code, Build in Cloud native Applications using Pipeline and Examine the Software and Automation Testing Frameworks.  Analyze need of Containerization in SDLC and Examine the Kubernetes Pod Configuration. Inspect Configuration Management using Infrastructure as Code, Analyze Continuous Monitoring and Container Orchestration process. To Build and Inspect the Tools associated to DevOps Life Cycle. Understand the various types of signals, systems and their frequency domain transformation. Understand the design methodology of different filters and their realizations. Apply signal processing approaches for extraction of information present in the natural signals. Apply machine learning approaches for processing of signals. Apply above signal processing approaches in tutorial problems related to transformation, filtering, feature extraction, machine learning for signal processing Understand IaaS Architectures and Implementation Guidelines. Apply on-demand compute services Analyze applications and frameworks for data analyzes applications and frameworks for data analyze applications and frameworks for data analyze Cloud Service Availability, Resiliency and dynamic scaling Use Networking and security Services. Automate cloud Infrastructure, Deployment and Management Hands-On Cloud Administration. Implement monitor, and manage important cloud services and components including IaaS and PaaS To Understand the Concept of Business Analytics in detail from domains perspective. To analyze the application of R using Descriptive Statistics and Correlation concepts. To analyze the application of select Multivariate			
CO4 1	Apply machine learning approaches for processing of signals. Apply above signal processing approaches in tutorial			
CO 5	problems related to transformation, filtering, feature			
	Understand IaaS Architectures and Implementation Guidelines. Apply on-demand compute services			
CO 2	Analyze applications and frameworks for data			
CLOUD	Analyze Cloud Service Availability, Resiliency and			
& SERVICES CO 4	Use Networking and security Services. Automate cloud Infrastructure, Deployment and Management			
CO 5	monitor, and manage important cloud services and components including IaaS and PaaS			
CRYPT ANALYSIS & CO 2	To analyze the application of R using Descriptive Statistics and Correlation concepts.			
22CS3040RA CYBER DEFENSE CO.3	To analyze the application of Data Visualization			
CO 4	To analyze the application of select Multivariate Analytical tools using R.			
EMBEDDED CO 1	Understand C for Embedded Systems. Analyse ARM			
	Apply Modern Assembly Language Programming with the ARM Processor			



Course Code	Course Title	CO NO	Description of the Course Outcome			
		CO 3	Apply I/O Synchronization and Interrupt Programming. Program the STM32F4xx chip peripherals: I/O ports, ADCs,			
		CO 4	Understand Analog Interfacing and Program the STM32F4xx chip peripherals: DACs, SPIs, and I2Cs			
		CO 5	Apply Embedded Systems Programming on ARM Cortex-M3/M4 Processor			
		CO 1	Apply I/O Synchronization and Interrupt Programming. Program the STM32F4xx chip peripherals: I/O ports, ADCs, Understand Analog Interfacing and Program the STM32F4xx chip peripherals: DACs, SPIs, and I2Cs Apply Embedded Systems Programming on ARM Cortex-M3/M4 Processor Understand the basic terminology and measurements of Machine Learning and Apply Machine Learning techniques using Tree and Bayesian models.  Apply and analyze Neural Network and SVM Models for solving Classification and Prediction problems Apply Dimensionality reduction methods, Evolutionary learning and Ensembled methods to solve classification problems Illustrate different unsupervised models, Analytical, Explanation-Based and reinforcement learning methods Implement Machine Learning Techniques using Python Language Interpret fuzzy logic system Analyze Artificial Neural Network Models Demonstrate Swarm and Evolutionary Algorithms Illustrate Hybrid Fuzzy-Neural- Evolutionary- Swarm Models Demonstration of neuro, fuzzy, evolutionary, and swarm algorithms using open-source tools Understand and build basic network representations, topologies, and models Apply various techniques for training and optimizing neural networks Analyze different techniques related to network stochastics Analyze different techniques related to network stochastics Analyze different techniques related to network stochastics Analyze different approaches and technologies related to these algorithms Evaluate different approaches and techniques for solving problems involving neural networks and their applications using python and develop knowledge on emerging software, tools and technologies related to these approaches Able to understand Deep learning and remember the concepts of Perception, Back Propagation, Able to understand Deep learning and remember the concepts of Perception, Back Propagation, Able to understand Deep learning and remember the concepts of Perception, Back Propagation,			
		CO 2	Apply I/O Synchronization and Interrupt Programming. Program the STM32F4xx chip peripherals: I/O ports, ADCs, Understand Analog Interfacing and Program the STM32F4xx chip peripherals: DACs, SPIs, and IZCs Apply Embedded Systems Programming on ARM Cortex-M3/M4 Processor Understand the basic terminology and measurements of Machine Learning and Apply Machine Learning techniques using Tree and Bayesian models.  Apply and analyze Neural Network and SVM Models for solving Classification and Prediction problems Apply Dimensionality reduction methods Evolutionary learning and Ensembled methods to solve classification problems Illustrate different unsupervised models, Analytical Explanation-Based and reinforcement learning methods Implement Machine Learning Techniques using Python Language Interpret fuzzy logic system Analyze Artificial Neural Network Models Demonstrate Swarm and Evolutionary Algorithms Illustrate Hybrid Fuzzy-Neural- Evolutionary- Swarm Models Demonstration of neuro, fuzzy, evolutionary, and swarm algorithms using open-source tools Understand and build basic network representations topologies, and models Apply various techniques for training and optimizing neural networks Analyze different techniques related to learning algorithms for neural networks and develop knowledge on emerging software, tools and technologies related to these algorithms Evaluate different approaches and techniques for solving problems involving neural networks and technologies related to these approaches Able to understand Deep learning and remember the concepts of Perception, Back Propagation, Able to understand and cNN techniques to generate Deep learning models			
22CS3020RA	MACHINE LEARNING	CO 3	Evolutionary learning and Ensembled methods to solve classification problems Illustrate different unsupervised models, Analytical, Explanation-Based and reinforcement learning			
		CO 4	Illustrate different unsupervised models, Analytical, Explanation-Based and reinforcement learning methods			
		CO 5				
		CO 1	Interpret fuzzy logic system			
		CO 2	Interpret fuzzy logic system Analyze Artificial Neural Network Models			
		CO 3	Demonstrate Swarm and Evolutionary Algorithms			
22CS3022RA SOFT COMPUTING	CO 4	Evolutionary learning and Ensembled methods to solve classification problems  Illustrate different unsupervised models, Analytical, Explanation-Based and reinforcement learning methods  Implement Machine Learning Techniques using Python Language  Interpret fuzzy logic system  Analyze Artificial Neural Network Models  Demonstrate Swarm and Evolutionary Algorithms  Illustrate Hybrid Fuzzy-Neural- Evolutionary- Swarm Models  Demonstration of neuro, fuzzy, evolutionary, and swarm algorithms using open-source tools  Understand and build basic network representations, topologies, and models  Apply various techniques for training and optimizing neural networks  Analyze different techniques related to network stochastics				
		CO 5				
		CO 1				
8"		CO 2	neural networks			
	rg.	CO 3	stochastics			
22CS3026RA ARTIFICIAL NEURAL NETWORKS	NEURAL	CO 4	algorithms for neural networks and develop knowledge on emerging software, tools and technologies related to these algorithms			
	CO 5	solving problems involving neural networks and their applications using python and develop knowledge on emerging software, tools and				
22CS3269RA		CO 1	Apply Embedded Systems Programming on ARM Cortex-M3/M4 Processor  Understand the basic terminology and measurements of Machine Learning and Apply Machine Learning techniques using Tree and Bayesian models.  Apply and analyze Neural Network and SVM Models for solving Classification and Prediction problems  Apply Dimensionality reduction methods, Evolutionary learning and Ensembled methods to solve classification problems  Illustrate different unsupervised models, Analytical, Explanation-Based and reinforcement learning methods  Implement Machine Learning Techniques using Python Language  Interpret fuzzy logic system  Analyze Artificial Neural Network Models  Demonstrate Swarm and Evolutionary Algorithms  Illustrate Hybrid Fuzzy-Neural- Evolutionary- Swarm Models  Demonstration of neuro, fuzzy, evolutionary, and swarm algorithms using open-source tools  Understand and build basic network representations, topologies, and models  Apply various techniques for training and optimizing neural networks  Analyze different techniques related to network stochastics  Analyze different techniques related to learning algorithms for neural networks and develop knowledge on emerging software, tools and technologies related to these algorithms  Evaluate different approaches and techniques for solving problems involving neural networks and their applications using python and develop knowledge on emerging software, tools and technologies related to these approaches  Able to understand Deep learning and remember the concepts of Perception, Back Propagation,  Able to understand auto encoders- and apply Regularization, and CNN techniques to generate			
	DEEP LEARNING	CO 2	Regularization, and CNN techniques to generate Deep learning models			
		CO 3	RoltzmannMachines			

HEAD OF THE DEPARTMENT

Computer Science and Engineering

Computer Science to be University)

KLEF, (Deemed to be University)

KLEF, (Deemed to be University)

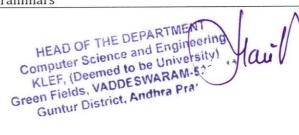
KLEF, (Deemed to be University)

Green Fields, VADDESWARAM 522 302

Guntur District, Andhra Pradesh

Guntur District, Andhra Pradesh

Course Code	Course Title	CO NO	Description of the Course Outcome		
		CO 4	Build Markov models, Markov networks, Markov chains,		
		CO 5	Implement basic Neural Networks, optimization algorithms		
		CO 1	Understand cognitive computing is, and how it differs from traditional approaches		
		CO 2	Applying the primary tools associated with cognitive computing		
22CS3270RA	COGNITIVE	CO 3	Develop a project that leverages cognitive computing		
	COMPUTING	CO 4	Analyse and discuss the business implications of cognitive computing		
		CO 5	able to implement cognitive computing programs using IBM Watson		
		CO 1	Understand image representation and modeling.		
		CO 2	Understand image transformation methods.		
22CS3271RA	PERCEPTION AND	CO 3	Apply and Interpret image processing algorithms.		
2200271141	COMPUTER VISION	CO 4	algorithms.		
		CO 5	Evaluate a multitude of image processing techniques and algorithms.		
		CO 1	Understanding the video signals and its characteristics		
		CO 2	Understanding the motion analysis, its detection and restoration of video with quality		
22CS3278RA	DIGITAL VIDEO	CO 3	Understand image representation and modeling.  Understand image transformation methods.  Apply and Interpret image processing algorithms.  Build and evaluate face detection and recognition algorithms.  Evaluate a multitude of image processing techniques and algorithms.  Understanding the video signals and its characteristics  Understanding the motion analysis, its detection and restoration of video with quality  Understanding video segmentation and motion segmentation using different methods  Learning to analyse the signals using different algorithms  Applying the machine learning algorithms to video signals for the analysis, segmentation and restoration.  Understand the models of Epidemiology and applications of computational science in Epidemiology		
	PROCESSING	CO 4	Learning to analyse the signals using different algorithms		
(a6)		.CO 5	The Committee of the Co		
		CO 1	applications of computational science in		
	COMPUTATIONAL	CO 2	Understanding video segmentation and motion segmentation using different methods  Learning to analyse the signals using different algorithms  Applying the machine learning algorithms to vide signals for the analysis, segmentation are restoration.  Understand the models of Epidemiology are applications of computational science Epidemiology  Apply computational model on sparse disease incidence data to infer transmission probability period of infectivity and reproduction number		
22CS3272RA	EPIDEMIOLOGY	CO 3	Design a low cost surveillance and infection control policy using an efficient computational model		
		CO 4	Design a computational model for epidemic spread using Machine Learning concepts		
		CO 5	Build and Inspect tools associated Epidemiology using R		
	NATUDAL	CO 1	Understand approaches to syntax and semantics in NLP		
22CS3273RA	NATURAL LANGUAGE PROCESSING	CO 2	Apply the statistical estimation and statistical alignment models		
PRO	1 NOCESSING	CO 3	Analyze grammar formalism and context free grammars		



Course Code	Course Title	CO NO	Description of the Course Outcome			
		CO 4	Apply Rule based Techniques, Statistical Machine translation (SMT), word alignment			
		CO 5	using python			
		CO 1	mechanism, acoustic phonetics and phonology,			
		CO 2	Apply Rule based Techniques, Statistical Machine translation (SMT), word alignment Inspect and Evaluate Language Processing Methods using python Understand the speech production and perception mechanism, acoustic phonetics and phonology, speech prosody, and speech sound units. Understand the speech signal processing in time and frequency domain, discrete Fourier transform, short-time analysis of speech, linear prediction and cepstral analysis of speech, linear prediction and cepstral analysis of speech.  Apply machine learning models such as Dynamic time warping (DTW), Gaussian mixture models (GMM), Hidden Markov models (HMM), Support vector machines (SVM) and state of art Deep Neural Network (DNN) models, for speech processing.  Apply machine learning approaches for various application of speech processing such as Speech and Speaker recognition, Speech synthesis and Speech enhancement, Language identification etc.  Apply above speech processing approaches in laboratory experiments related to feature extraction and development of machine learning models for speech processing.  Understand the modelling of various types of data Understand the Visualization fundamentals  Apply methods and tools for Non-Spatial Data Visualization  Apply methods for Scientific / Spatial Data Visualization and Web data visualization  Evaluate data visualization through Python & Tableau.  Understand Data Warehousing Techniques and apply different data processing techniques.  Implementation of Data Pre-Processing Techniques.  Apply mining Algorithms for classifying data into different classes using labeled data.  Applying unsupervised learning algorithm for data categorization.  Implement mining algorithms using modern tolls and techniques for data processing.  Understand Initial exploration of data and advanced data analytics by using R  Apply advanced algorithms & Statistical modeling fo big data using HDFS, HIVE, and PIG.  Apply advanced SQL functions for in-databas			
22CS3274RA	SPEECH PROCESSING	CO 3	time warping (DTW), Gaussian mixture mode (GMM), Hidden Markov models (HMM), Suppo vector machines (SVM) and state of art Deep Neur Network (DNN) models, for speech processing.  Apply machine learning approaches for various application of speech processing such as Speech are Speaker recognition, Speech synthesis and Speech			
		CO 4	Apply machine learning approaches for various application of speech processing such as Speech and Speaker recognition, Speech synthesis and Speech enhancement, Language identification etc.			
		CO 5	Apply above speech processing approaches in laboratory experiments related to feature extraction, and development of machine learning models for speech processing.			
		CO 1	laboratory experiments related to feature extraction and development of machine learning models for speech processing.  Understand the modelling of various types of data			
		CO 2				
22CS3275RA	BIG DATA	CO 3	Apply methods and tools for Non-Spatial Data Visualization			
	ANALYTICS	CO 4	I CONTRACTOR CONTRACT			
×*		CO 5	Evaluate data visualization through Python &			
		CO 1	Understand Data Warehousing Techniques and apply different data processing techniques.			
		CO 2				
22CS3052RA	DATA WAREHOUSING &	CO 3	Apply mining Algorithms for classifying data into			
	MINING	CO 4	Applying unsupervised learning algorithm for data categorization.			
		CO 5	Implement mining algorithms using modern tolls and			
		CO 1	Understand the concepts of big data, Initial			
	DATA	CO 2	Understand Initial exploration of data and advanced			
	VISUALISATION TECHNIQUES	CO 3	time analysis of speech, linear prediction and cepstral analysis of speech.  Apply machine learning models such as Dynamic time warping (DTW), Gaussian mixture models (GMM), Hidden Markov models (HMM), Support vector machines (SVM) and state of art Deep Neural Network (DNN) models, for speech processing.  Apply machine learning approaches for various application of speech processing such as Speech and Speaker recognition, Speech synthesis and Speech enhancement, Language identification etc.  Apply above speech processing approaches in laboratory experiments related to feature extraction, and development of machine learning models for speech processing.  Understand the modelling of various types of data Understand the Wisualization fundamentals  Apply methods and tools for Non-Spatial Data Visualization  Apply methods for Scientific / Spatial Data Visualization and Web data visualization  Evaluate data visualization through Python & Tableau.  Understand Data Warehousing Techniques and apply different data processing techniques.  Implementation of Data Pre-Processing Techniques.  Apply mining Algorithms for classifying data into different classes using labeled data.  Applying unsupervised learning algorithm for data categorization.  Implement mining algorithms using modern tolls and techniques for data processing.  Understand the concepts of big data, Initia exploration of analysis of data and Data visualization Understand Initial exploration of data and advanced data analytics by using R  Apply advanced algorithms & Statistical modeling for big data using HDFS, HIVE, and PIG.  Apply advanced SQL functions for in-database			
		CO 4	Apply advanced SQL functions for in-database analytics by MADlib, Greenplum along with common deliverables of analytics life cycle project			

HEAD OF THE DEPARTMENT
Computer Science and Engineering
KLEF, (Deemed to be University)
KLEF, (Deemed to be University)
Green Fields, VADDESWARANI-522 302
Guntur District, Andhra Pradesh

Course Code	Course Title	CO NO	Description of the Course Outcome
		CO 5	Build and Evaluate the Big Data Analytical problem using R, Hadoop, HIVE Programming concepts.
		CO 1	Understand optimization methods and Apply analytics using R
2200227604	DIC DATA	CO 2	Apply blind search method and Local Search method for real world problems
22CS3276RA	BIG DATA OPTIMIZATION	CO 3	Analyz population-based search and develop query processing strategies
		CO 4	Apply and Analyze applications like Travelling Salesman Problem.
		CO 5	Applying functionalities of R
		CO 1	Understand the Overview of Bioinformatics, biological databases, and comparing a data network to a living organism.
		CO 2	Select online resources in biological database
22CS3277RA	BIOINFORMATICS	CO 3	Apply concepts of microarrays and datamining methods.
		CO 4	Analyze pattern matching techniques of sequence alignment and identification
		CO 5	Implement the lab experiments to store and analysis of biological data
	ADVANCED DATABASES	CO 1	Understand the fundamentals of query optimization and database recovery protocols.
22CS3279RA		CO 2	Apply emerging database technologies and distributed databases.
2200277141		CO 3	Analyze and Discriminate object oriented and relational database systems.
		CO 4	Analyze multimedia databases.
		CO 5	Build and Evaluate advanced database applications
	GRAPH & WEB ANALYTICS	CO 1	Understand the impact of big data on graphs, Network Basics and Social Networks
		CO 2	Make use of Web Analytics: - Data sources, tools, Web traffic data.
22CS3280RA		CO 3	Analysing Web Analytics Strategy- website traffic analysis, audience identification and segmentation analysis, Emerging Analytics
		CO 4	Compare Email Testing Analysis, competitive Intelligence Analysis, and Social, Mobile, Video Analysis.
		CO 5	Implementing Python programing for graph and web analytics
		CO 1	Understand IaaS Architectures and Implementation Guidelines. Apply on-demand compute services
22CS3037RA	CLOUD	CO 2	Analyze applications and frameworks for data analysis and Content delivery in the cloud
	INFRASTRUCTURE & SERVICES	CO 3	Understand Cloud Service Availability, Resiliency and dynamic scaling
		CO 4	Analyze Networking and security Services for Cloud Deployment and Management

HEAD OF THE DEPARTMENT

Computer Science and Engineering

Computer Science and University)

KLEF, (Deemed to be University)

KLEF, (Deemed to be University)

Green Fields, VADDESWARAM-522 304

Green Fields, VADDESWARAM-Fradesh

Guntur District, Andhra Pradesh

Course Code	Course Title	CO NO	Description of the Course Outcome
		CO 5	Developing Cloud services using Open Cloud Architectures-EUCALYPTUS
		CO 1	Understand the design of multiprocessor and distributed Operating Systems. Analyze distributed file system.
		CO 2	Analyze the scheduling Real time and Parallel Applications on Heterogeneous Distributed Systems. Analyze three basic approaches for implementing distributed mutual exclusion
22CS3032RA	ADVANCED OPERATING SYSTEMS	CO 3	Understand Replication – preventing and accepting divergence. Analyze Deadlock detection in distributed systems.
		CO 4	Analyze the algorithms for Checkpointing and rollback recovery, Consensus and agreement algorithms, and Failure detectors
		CO 5	Implement the Concepts of multiprocessor Threads, distributed mutual exclusion, distributed scheduling, Distributed deadlocks, Distributed consensuses and Fault Handling.
	FUNCTIONAL & CONCURRENT PROGRAMMING	CO 1	Apply Functions and Lambdas on purely functional programs using generic types, recursion, pattern matching and higher-order functions.
22CS3036RA		CO 2	Apply Algebraic Data Types to model and use infinite sequences with lazy evaluation, functional programming with objects and classes
		CO 3	Apply Functional Data Structures, collections, Parallel Collections, Futures and Promises
		CO 4	Apply the functional design of concurrent systems
		CO 5	Apply the functional design of concurrent systems
	2	CO 1	Understand Cloud computing and analyse cloud service scheduling hierarchy.
		CO 2	Understand Functions-as-a-service and Event-driven programming. Develop Scalable ModelsUsingServerless Architectures.
22CS3281RA	CLOUD & SERVERLESS	CO 3	Manage application functionalities using Serverless runtimes and Serverless databases.
	COMPUTING	CO 4	Apply Serverless Programming Practices and Patterns. Architect, Build, and Operateserverless applications.
		CO 5	Build a real world and scalable full stack application using Serverless technologies
		CO 1	Understand fundamentals of computer design
226225424	ADVANCED	CO 2	Understand instruction level parallelism
22CS3251RA	COMPUTER	CO 3	Apply thread level parallelism
	ARCHITECTURE	CO 4	Analyse memory and I/O
		CO 5	Develop programs on computer architectures
22CS3252RA	PARALLEL ALGORITHMS	CO 1	Understand fundamental principles behind parallel algorithm design and demonstrate the ability to differentiate among interconnection networks models and communication operations.

HEAD OF THE DEPARTMENT Computer Science and Engineering KLEF, (Deemed to be University)

KLEF, (Deemed to be University)

Green Fields, VADDESWARAM-522

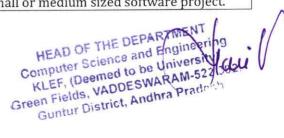
Guntur District, Andhra Pradic

Course Code	Course Title	CO NO	Description of the Course Outcome
		CO 2	Analyze parallel algorithms for sorting and Computational Geometry
		CO 3	Design and Analysis of Parallel Computational algorithms
		CO 4	Apply parallel algorithms for Graphs and Search problems and analyze its performance
		CO 5	Develop parallel algorithms using OpenMP, MPI and OpenCL
		CO 1	Understand the principles of cryptography and apply various cryptographic algorithms
22CS3287RA	CLOUD SECURITY	CO 2	Analyze various security issues and system vulnerabilities in virtualization
	CLOOD SECORITI	CO 3	Analyze the technologies for virtualization-based security enhancements
		CO 4	Analyze legal and Compliance issues and examine modern security standards
		CO 1	Describe the Edge/Fog Computing and infer the opportunities and challenges
2266225224	EDGE COMPUTING	CO 2	Examine the Architecture of Edge Computing and explore the issues that are being addressed by the industry
22CS3253RA		CO 3	Interpret the Middleware needed for Edge Computing and its Security Requirements
		CO 4	Assess the need for Edge/Fog Computing in various real-time projects
		CO 5	computing paradigms using various applications in Edge Computing
		CO 1	Analyze the performance of GPU memory hierarchy and MPI programming
22CS3038RA	HIGH	CO 2	Develop parallel programs using OpenCL library and understand FPGA-Based Supercomputer
22C53038RA	PERFORMANCE COMPUTING	CO 3	Develop mixed mode programs for Multicore, GPU and cluster optimization systems
		CO 4	Generate parallel programs for matrix, graph and sorting problems using Cuda, OpenMP library
	CRYPT ANALYSIS & CYBER DEFENSE	CO 1	Understand the principles of cryptography by analyzing various attacks and apply different classic encryption techniques.
		CO 2	Understand the principles of block cipher and apply algorithms like DES, AES.
22CS3041RA		CO 3	Understand and apply different algorithms of public key crypto system for ensuring secured communication and authentication.
		CO 4	Understand the concept of elliptic curve and its applications to cryptography. Apply hash algorithms for security.
		CO 5	Implement various cryptographic algorithms so as to analyze the achievability of security goals like Confidentiality, integrity, authentication and also Justify the possibility of cryptanalysis attack with

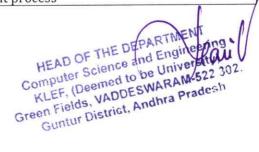
HEAD OF THE DEPARTMENT
Computer Science and Engineering
KLEF, (Deemed to be University)
KLEF, (Deemed to be University)
Green Fields, VADDESWARAM-522
Guntur District, Andhra

Course Code	Course Title	CO NO	Description of the Course Outcome
			each algorithm.
		CO 1	Understand security concepts, Infrastructure security techniques and securing enterprise networks Understand router and switching security mechanism.
	NETWORK &	CO 2	Understand hardware procedures for digita certificate and techniques of user authentication.
22CS3042RA	INFRASTRUCTURE SECURITY	CO 3	Appy the standardization schemes to maintain security in Web application and secured payment system. Identify security vulnerability in the system.
		CO 4	Apply security concepts in Email and Interne Protocol.
1.		CO 5	Understand and apply security principles of firewall gateways and IDS.
		CO 1	Understand the basic concepts of cryptography for Blockchain
	INTRODUCTION TO	CO 2	Understand the basics of Blockchain and mining process
22CS3045RA	BLOCKCHAIN & CRYPTO CURRENCIES	CO 3	Apply about the different types of Blockchain and consensus algorithms
		CO 4	Apply the different types of crypto currencies & it importance and Blockchain applications
		CO 5	Apply and analyze basic cryptography concepts and smart contracts applications using soft wallet
		CO 1	Apply Forensic Science and Digital Forensics
22CS3259RA	DIGITAL	CO 2	Apply OS and File System Forensics
22000207101	FORENSICS	CO 3	Analyze Digital Evidence and Network Forensics
	79 CONTRACTOR OF THE PROPERTY	CO 4	Analyze Web Forensics and Mobile Device Forensics
		CO 5	Implementing the concepts of Digital Forensics Understand Database Users, Roles related to Use
	D. I	CO 2	Administration and Java concepts  Apply Data Encryption and Database Vaults
22CS3260RA	DATABASE & SYSTEM SECURITY	CO 3	Apply secret password Encryption & Decryption.
	STSTEM SECORITI	CO 4	Apply Data Encryption for the Data in Transit.
		CO 5	Design Secure Database Schema
ti.		CO 1	Understanding Ethereumblockchain and using walls for interacting with network
	7	CO 2	Learn and use solidity programming language t build smart contracts
22CS3261RA	PROGRAMMING FOR SMART	CO 3	Building advanced smart contracts with various tes setups and try-catch assertions.
	CONTRACTS	CO 4	Build interactive front end for smart contracts an use Contracts design patterns.
		CO 5	Implement lab experiments through project-base learning on building smart contracts
			HEAD OF THE DEPARTMENT  Computer Science and Engineering  Computer Science and Engineering  KLEF, (Deemed to be University)  KLEF, (Deemed to be University)  Green Fields, VADDESWARAM-522  Guntur District, Andhra Pradesh

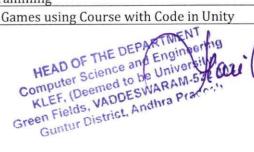
Course Code	Course Title	CO NO	Description of the Course Outcome
		CO 1	Explain about threats and its properties that target software and illustrate the resources that addresses these issues.
	CHCVIDE	CO 2	Illustrate the process of analysing and validating security requirements.
22CS3262RA	SECURE SOFTWARE ENGINEERING	CO 3	Apply software testing methods to analyse the software code to improve the quality and describe the assembly changes for system design.
		CO 4	Apply the governance security policy to ensure enterprise security in project management
		CO 5	Analyse the security principles and apply the techniques to develop a secure software.
O.		CO 1	Students should be able to understand the basic concepts of web security
		CO 2	Students should be able to identify different techniques in protecting privacy and principles of web security
22CS3264RA	WEB SECURITY	CO 3	Students should be able to deploy SSL server certificates, Clint side digital certificates and Microsoft authenticode.
		CO 4	Students should be able to determine security for content providers through privacy policies and security legislations.
		CO 5	Students should be able to test software/ tools application completely and make sure that it's performing well and as per the security specifications.
		CO 1	Fundamentals of information security management
	SECURITY GOVERNANCE & MANAGEMENT	CO 2	Understand the principles of cryptography by analyzing various attacks and apply different classic encryption techniques
22CS3291RA		CO 3	To analyse basic number theory, cryptography concepts and smart contracts applications using soft walltet.
		CO 4	Apply security concepts in Email and Internet Protocol. Understand and apply security principles of firewall, gateways and IDS
		CO 5	Analyse various security concepts and their performance using networking tools
22(5306204	SOFTWARE VERIFICATION & VALIDATION	CO 1	To Understand test cases suitable for a software development for different domains.
22CS3062RA		CO 2	To Identify and apply suitable tests to be carried out. Conduct an inspection or review of software source code for a small or medium sized software project.



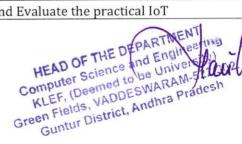
Course Code	Course Title	CO NO	Description of the Course Outcome
		CO 3	Prepare and apply test planning based on the document using automatic testing tools.
		CO 4	To Document test plans and apply test cases designed
		CO 5	To Test the software application completely and make it sure that it's performing well and as per the specifications
		CO 1	Illustrate how Test-Driven Development and Refactoring work in software design and maintenance.
	DECICN DATTEDNO	CO 2	Understanding Structural and Creational Patterns for effective design of a system
22CS3065RA	DESIGN PATTERNS & CLEAN CODING TECHNIQUES	CO 3	Utilization of behavioural design pattern and Anti- patterns for system design
	TECHNIQUES	CO 4	Understanding the design patterns in an object- oriented language along with clean coding principles to a real world application.
		CO 5	Develop Programs on concepts of Design patterns in JAVA
		CO 1	Identify the Need of DevOps in SDLC and Cloud Infrastructure in DevOps, Apply Version Control System to track the latest version of Software
22CS3256RA	CONTINUOUS DELIVERY &	CO 2	Apply Continuous Integration and Continuous Deployment using Infrastructure as Code, Build in Cloud native Applications using Pipeline and Examine the Software and Automation Testing Frameworks.
	DEVOPS	CO 3	Analyze need of Containerization in SDLC and Examine the Kubernetes Pod Configuration.
	æ	CO 4	Inspect Configuration Management using Infrastructure as Code, Analyze Continuous Monitoring and Container Orchestration process.
		CO 5	To Build and Inspect the Tools associated to DevOps Life Cycle.
		CO 1	Apply the concepts of C#.Net and Build console and desktop applications.
22CS3257RA		CO 2	Build C#.net desktop applications using ADO.NET and also implementing GUI applications using Event handling
	VISUAL PROGRAMING	CO 3	Applying the concepts of ASP.NET Standard Server controls and State management techniques to Build the Web applications using ASP.NET Web forms.
		CO 4	Apply the Asp.Net MVC concepts to Build the Web MVC applications
		CO 5	Develop the programs for Visual Programming application development.
22CS3231RA	SOFTWARE PROJECT	CO 1	Understanding the concept of software project management process



Course Code	Course Title	CO NO	Description of the Course Outcome
	MANAGEMENT	CO 2	Illustrate the various rules and guidelines that involved to improve the time, Cost, Quality, management aspects in software project management.
		CO 3	Identify the guidelines that are involved to improve the Configuration, Human Resource time, Communications management aspects in software project management.
		CO 4	Build the techniques that are involved in the Phases of SPM such as Initiating, planning, executing & controlling projects.
		CO 5	Apply various estimation levels of cost and effort
		CO 1	Able to Understand about software architecture and architectural drivers.
	SOFTWARE	CO 2	Able to analyze the quality attributes and their scenarios.
22CS3295RA	ARCHITECTURE & DESIGN	CO 3	Able to Understand architectural styles and apply the knowledge various real time applications.
		CO 4	Able to Analyze and create the documenting the architecture and apply to web services
		CO 5	Evaluate Lab experiments using UML diagrams
		CO 1	Understand Software Reliability and develop a software project from requirement gathering to implementation.
2265275004	COETMADE	CO 2	Analyze software system failures and develop convincing solutions
22CS3258RA	SOFTWARE RELIABILITY	CO 3	Estimate Software Reliability parameters using Markovian Modelling, Maximum Likelihood and Least Square Method
,	8	CO 4	Evaluate performance of Binomial-Type, Poison-Type and Markovian Models and Predict Software Reliability using SQA Intelligent Techniques
		CO 1	Gaining Knowledge on Kotlin basics and to Design on Android Layouts, Views and Navigations
22CS3255RA	CROSS-PLATFORM DEVELOPMENT	CO 2	Apply techniques on various devices, internet and to connect with various databases
	FRAMEWORKS	CO 3	overview on DART and Flutter Technologies
	1	CO 4	Develop and deploy dynamic Flutter applications
		CO 5	Design and work on various platforms
		CO 1	Illustrate the concepts of Game design and development.
	DD COD WATER	CO 2	Understanding the use of mathematical and geometrical concepts in Game Programming.
22CS3071RA	PROGRAMMING FOR GAME DEVELOPMENT	CO 3	Explain the Core architectures of Game Programming.
		CO 4	Relate above advance concepts in game development and explain various platforms and frameworks for Game Programming
		CO 5	Implement Games using Course with Code in Unity

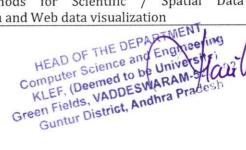


Course Code	Course Title	CO NO	Description of the Course Outcome
	AR & VR	CO 1	To understand Basics of Augmented Reality and Interactions. Fundamentals of Augmented, Mixed Reality and its features P
22CS3266RA		CO 2	To understand Basics of Virtual Reality and Interactions. Fundamental Concept and Components of Virtual Reality
22C33200RA	APPLICATION DEVELOPMENT	CO 3	To understand Graphics Pipelines, Creating a sample augmented reality apps in android
-		CO 4	To apply Unity development Environment, IDE Basics, Sprites, User Interfaces, Simple 3D animation Creation
		CO 5	Develop applications through Lab experiments
		CO 1	Apply techniques of computer graphics for the generation of objects.
		CO 2	Model 2D objects using 2D Transformations.
22CS3296RA	COMPUTER GRAPHICS	CO 3	Identify clipping algorithms that are used to remove objects, lines, or line segments that are outside the viewing pane.
		CO 4	Inspect algorithms to find out visible surfaces
		CO 5	Develop graphical objects with modeling.
	PRINCIPLES OF GAME DESIGN	CO 1	Remembering the definition of Video Games and Design Components
		CO 2	Understand the Game Concepts and its world
22CS3268RA		CO 3	Applying the Story telling Character and user interface Design
		CO 4	Analyzing the Game Play to its mechanics and balancing
	BUSINESS OF GAMES & ENTREPRENEURSH IP	CO 1	Understanding the flow of money in the game industry & how to protect ideas to make the craft of making games an economically justifiable activity.
et.		CO 2	Explore the mechanism behind gaming production and teamwork with foundation in some of the project management tools and techniques
22CS3267RA		CO 3	Understand and work out some of the presentation skills to pitch the gaming ideas in front of investor groups
		CO 4	Explore the skills required to be an entrepreneur and know the rules and regulations to start a company
		CO 5	Explore and Understand Pitching tools & Business Plan Development tools for Gaming startup
		CO 1	Understand the role of sensor and actuators in real time aspects and Analog and Digital Actuators
	IOT SENSING AND	CO 2	Apply the role of signal conditioning circuits and Impedance Matching circuits
22CS3117RA	ACTUATING DEVICES	CO 3	Analyze different generation of sensors for the development of IoT based Networks
	22,1000	CO 4	Analyse the role of different Energy sources and power management in IoT
			power management in to

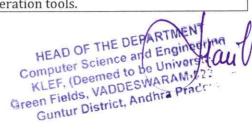


Course Code	Course Title	CO NO	Description of the Course Outcome
	INTERNET OF	CO 1	Understand the Architectural Overview of IoT
		CO 2	Understand the IoT Reference Architecture and Real- World Design Constraints
22CS3118RA	THINGS: ARCHITECTURES	CO 3	Apply the various IoT Protocols in Datalink and Network layers
	AND PROTOCOLS	CO 4	Apply the various IoT Protocols in Transport and Session Layers
		CO 5	Create IoT based applications using IoT protocols
		CO 1	Apply mathematical concepts for modeling to design automation
		CO 2	Apply Middle and High Level Design Decisions to design the automation
22CS3298RA	CYBER PHYSICAL SYSTEMS	CO 3	Analyze the Human interaction with CPS by making use of IoT Sensors
		CO 4	Analyze AADL and make use of it for modelling the automation
		CO 5	Implement the models and design smart models for automobiles, medical devices and home appliances.
		CO 1	Understand the History of Embedded & Hybrid System concepts, Purpose of Embedded & Hybrid Systems. Characteristics and Quality Attributes of Embedded & Hybrid Systems
	FOUNDATIONS OF HYBRID AND EMBEDDED SYSTEMS	CO 2	Understand Core of the Embedded System, Core of Hybrid System Memory selection for Embedded Systems & Hybrid Systems, Communication Interface
22CS3299RA		CO 3	Apply the Embedded & Hybrid Firmware tools Embedded & Hybrid Firmware Design Approaches and Development Languages.
,		CO 4	Apply Operating System Basics (RTOS) Understand and apply Multiprocessing and Multitasking, Tasl Scheduling.
		CO 5	Design and Prototype Embedded Computer Systems
		CO 1	To understand the differences between traditional deployment and cloud computing
		CO 2	Understand different cloud infrastructures and service models and virtualization
22CS3250RA	CLOUD COMPUTING FOR	CO 3	Apply the concept of Data Analytics by using AW cloud
	IOT ENGINEERS	CO 4	Analyze the statistical data analysis and methods fo evaluation
		CO 5	Able to evaluate the communication between Io' devices and cloud (AWS).by measuring parameters
		CO 1	Understand challenges and technologies for wireles networks
22CS3265RA	WIRELESS SENSOR	CO 2	Understand architecture and sensors.
	NETWORKS	CO 3	Apply the communication, energy efficiency computing, storage, and transmission strategies.
		CO 4	Build the infrastructure and simulations.
			HEAD OF THE DEPARTMENT  Computer Science and Engineer  KLEF, (Deemed to be University  KLEF, (Deemed to be University  KLEF, (Deemed to be University)  KLEF, (Deemed to be University)

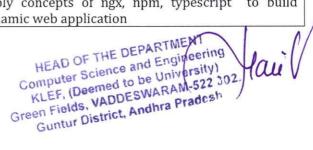
Course Code	Course Title	CO NO	Description of the Course Outcome
		CO 5	Apply the concept of programming the in WSN environment
		CO 1	Understand the various types of signals, systems and their frequency domain transformation.
		CO 2	Understand the design methodology of different filters and their realizations.
22CS3116RA	SIGNAL PROCESSING	CO 3	Apply signal processing approaches for extraction of information present in the natural signals.
	r ROCESSING	CO 4	Apply machine learning approaches for processing of signals.
		CO 5	Apply above signal processing approaches in tutorial problems related to transformation, filtering, feature extraction, machine learning for signal processing
		CO 1	To Understand the Concept of Business Analytics in detail from domains perspective.
22CS3041RA	CRYPT ANALYSIS &	CO 2	To analyze the application of R using Descriptive Statistics and Correlation concepts.
	CYBER DEFENSE	CO 3	To analyze the application of Data Visualization techniques in Business Analytics using R.
		CO 4	To analyze the application of select Multivariate Analytical tools using R.
	EMBEDDED SYSTEMS	CO 1	Understand C for Embedded Systems. Analyse ARM processor and interrupt architecture
		CO 2	Apply Modern Assembly Language Programming with the ARM Processor
22CS3015RA		CO 3	Apply I/O Synchronization and Interrupt Programming. Program the STM32F4xx chip peripherals: I/O ports, ADCs,
		CO 4	Understand Analog Interfacing and Program the STM32F4xx chip peripherals: DACs, SPIs, and I2Cs
81	2*	CO 5	Apply Embedded Systems Programming on ARM Cortex-M3/M4 Processor
		CO 1	Apply Machine Learning Techniques using Decision Trees to solve Real World Problems
		CO 2	Build Bayesian models for solving Classification and Prediction problems
22CS3232RA	MACHINE LEARNING	CO 3	Apply Neural Network and Genetic Algorithm techniques to solve Classification, Prediction problems
		CO 4	Demonstrates Learning First Order Rules, Analytical Learning Explanation-Based Learning and reinforcement learning
		CO 5	Implement Machine Learning Techniques using Python Language
22CS3133RA	DATA	CO 1	Understand the modelling of various types of data and the Visualization fundamentals
	VISUALIZATION TECHNIQUES	CO 2	Apply methods and tools for Non-Spatial Data Visualization
		CO 3	Apply methods for Scientific / Spatial Data Visualization and Web data visualization



Course Code	Course Title	CO NO	Description of the Course Outcome
		CO 4	Understand the Dashboard and its categories and Apply visual analytics on dashboards
		CO 5	Evaluate data visualization through Python & Tableau /Power BI
		CO 1	Gaining Knowledge on Kotlin basics and to Design on Android Layouts, Views and Navigations
22CS3286RA	CROSS-PLATFORM DEVELOPMENT	CO 2	Apply techniques on various devices, internet and to connect with various databases
22C33200KA	FRAMEWORKS	CO 3	overview on DART and Flutter Technologies
		CO 4	Develop and deploy dynamic Flutter applications
		CO 5	Design and work on various platforms
		CO 1	Analyze, predict and apply the server based computing for hosting the web application with appropriate database and storage.
		CO 2	Implement the cloud services to monitor and secure the cloud infrastructure
22CS3234RA	APPLICATION DEVELOPMENT ON	CO 3	Analyze, predict and apply the CI/CD services for hosting the web application.
	CLOUD	CO 4	Analyze, predict and apply appropriate serverless, container based, work flow and messaging based services.
		CO 5	Apply the knowledge and implement the cloud concepts in real time.
		CO 1	Design Resilient Architectures
	SOLUTIONS	CO 2	Design High-Performing Architectures
22CS3235RA	ARCHITECTING ON	CO 3	Design Secure Applications and Architectures
	CLOUD	CO 4	Design Cost-Optimized Architectures
		CO 5	Designing solutions to the architecture of Cloud
2	,	CO 1	Apply the concepts of C#.Net and Build console and desktop applications.
	VISUAL PROGRAMING	CO 2	Build C#.net desktop applications using ADO.NET and also implementing GUI applications using Event handling
22CS3263RA		CO 3	Applying the concepts of ASP.NET Standard Server controls and State management techniques to Build the Web applications using ASP.NET Web forms.
		CO 4	Apply the Asp.Net MVC concepts to Build the Web MVC applications
		CO 5	Develop the programs for Visual Programming application development.
		CO 1	To design a Lexical analyzer for a given source code.
	COMPILER DESIGN	CO 2	To design different types of parsers and perform comparative analysis.
22CS3204RA		CO 3	To design an efficient syntax-directed translator and intermediate code generator.
		CO 4	To optimize and generate the translated code for the target machine.
		CO 5	To design a compiler for any given language using compiler generation tools.



Course Code	Course Title	CO NO	Description of the Course Outcome
	AUTOMATA THEORY AND	CO 1	To design finite machines, regular expressions and regular grammar for regular languages and to prove existence of non-regular languages.
00000004714		CO 2	To design Context Free Grammars for Context Free Languages and simplify them for optimization
22CS3061RA	FORMAL LANGUAGES	CO 3	To design Push Down Automata for CFL and to prove existence of non-Context Free languages
		CO 4	To design a Turing machine for a given problem and to prove the existence of Non-Turing acceptable languages.
		CO 1	To introduce basics of quantum computing
		CO 2	Implementing Quantum computing algorithms
22CS3065RA	QUANTUM	CO 3	Applying concepts of Quantum computing using QISKIT
	COMPUTING	CO 4	Analyze and Discuss Quantum Machine learning and deep learning concepts with applications
		CO 5	Practicals on all algorithms discussed above
	SOFTWARE VERIFICATION & VALIDATION	CO 1	To Understand test cases suitable for a software development for different domains.
		CO 2	To Identify and apply suitable tests to be carried out. Conduct an inspection or review of software source code for a small or medium sized software project.
22CS3066RA		CO 3	Prepare and apply test planning based on the document using automatic testing tools.
		CO 4	To Document test plans and apply test cases designed
		CO 5	To Test the software application completely and make it sure that it's performing well and as per the specifications
æ		CO 1	Understanding the basic concepts of " C#.Net and Build console and desktop applications using C#.net framework
		CO 2	Build C#.net desktop applications using ADO.NET
22CS3016RA	.NET PROGRAMMING	CO 3	Applying the concepts of ASP.NET Standard Server controls for application development
22033010KA	(EPAM)	CO 4	Build the applications using Web forms, Web Pages and MVC, Page and State management and master pages.
		CO 5	Develop the programs for desktop, web and enterprise application development using .NET Techniques.
		CO 1	Apply the concepts of HTML5 and CSS3 for static web application.
22CS3017RA	FRONT END WEB DEVELOPMENT (EPAM)	CO 2	Pertaining concepts of javascript to build client-side web application
		CO 3	Apply concepts of advanced UI Designing using extended Javascript
		CO 4	Apply concepts of ngx, npm, typescript to build dynamic web application



Course Code	Course Title	CO NO	Description of the Course Outcome
		CO 5	Develop the webapplication using various technologies like html, css, javascript, typescript
22CS3018RA	SOFTWARE TESTING (EPAM)	CO 1	Create test scenarios that are appropriate for software development in many fields
		CO 2	Determine the appropriate tests that should be run. Conduct a small- to medium-sized software proposal's source code inspection or review
		CO 3	Applying automated testing tools, create test plans based on the document.
		CO 4	Make test plans dependent on the document leveraging test automation tools.
		CO 5	Using automated testing tools, make test plans contingent on the document.
22CS3019RA	CLOUD DEVOPS (EPAM)	CO 1	Understanding the basic concepts of Cloud and Devops
		CO 2	Identify the Need of DevOps in SDLC and Cloud Infrastructure in DevOps, Apply Version Control System to track the latest version of Software
		CO 3	Inspect Configuration Management using Infrastructure as Code
		CO 4	Analyze need of Containerization in SDLC and Examine the Kubernetes Pod Configuration.
		CO 5	Build and Inspect the Tools associated to DevOps Life Cycle.
22CS40A7	FUNDAMENTALS OF SOFTWARE ENGINEERING	CO1	Comprehend software development life cycle and prepare SRS document
		CO2	Implementing software design and development techniques using UML
		CO3	Identify verification and validation methods in a software engineering project
		CO4	Optimize the development process using CMMI Levels
	FUNDAMENTALS OF DBMS	CO1	Understand the fundamentals of Database Management Systems.
22054046		CO2	Construct database tables using SQL
22CS40A6		CO3	Apply various Normalization techniques and develop procedures and functions in PL/SQL
		CO4	Apply the file storage structures in the Database Management and Transaction processing.
22CS40A8	FUNDAMENTALS OF INFORMATION TECHNOLOGY	CO1	Understand the architectural design of a computer and various basic concepts of operating systems
		CO2	Understand programming fundamentals Analyse various software development methodologies
		C03	Undestanding of database design and Apply various SQL commands and Transaction Processing.
		CO4	Apply OOP and model for different case studies using UML
22UC0008	INDIAN CONSTITUTION	CO1	To acquire knowledge of the historical developments that culminated in the drafting of the Indian Constitution.

HEAD OF THE DEPARTMENT
Computer Science and Engineering
KLEF, (Deemed to be University)
KLEF, (Deemed to be University)
Green Fields, VADDESWARAM-522
Green Fields, Andhra Pradesh
Guntur District, Andhra Pradesh

Course Code	Course Title	CO NO	Description of the Course Outcome
		CO2	To understand the basic features of the Indian Constitution.
		CO3	To understand the structure of the Federal government as defined by the Indian Constitution.
		CO4	To understand the Indian Judicial system and election commission of india
22UC0007	INDIAN HERITAGE & CULTURE	CO1	Familiarizing students with various aspects of Indian culture and how they contribute to the concept of Unity in Diversity
		CO2	Understand the beginnings of Indian History and the developments during the Ancient period
		CO3	Understand the developments in India during the Medieval Age along with how they contributed to Indian civilization
		CO4	Understand the reasons for colonial rule over India and how independence was achieved from British rule
22IE2040	SOCIAL INTERNSHIP (SI)	CO1	Industrial Training
22IE3042	RESEARCH SEMINAR	CO5	Analyze Research work
22IE3043	TERM PAPER	CO5	Analyze Research work
22IE4051	INTERNSHIP	CO1	Internship
		CO2	Understanding the importance of production training
		CO3	Applying the techniques in the live projects
		CO4	Analyzing the achieved output, compared to production requirments

HEAD OF THE DEPARTMENT
Computer Science and Engineering
KLEF, (Deemed to be University)
KLEF, (Deemed to be WARAM-52?
KLEF, VADDESWARAM-52?
Green Fields, VADDESWARAM-64.