B.E (CSE – IoT & CSBT) Program

B.E. Program Outcomes (PO's)

Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization for the solution of complex engineering problems.

Problem analysis: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

Conduct investigations of complex problem: Use research-based knowledge and research methods including design of experiments, analysis and interpretations of data, and synthesis of the information to provide valid conclusions.

Modern tool usage: Create, select, and apply appropriate technique, resources and modern engineering and IT tools, including prediction and modelling to complex engineering activities, with an understanding of the limitations.

The engineering and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.

Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Reports and design documentation, make effective presentations, and give and receive clear instructions.

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CBIT (A), Gandipet, Hyderabad-500 075.

Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, member and leader in a team, to manage projects and in multidisciplinary environments.

Life-long learning: Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM EDUCATION OBJECTIVES (PEO's): After the completion of the program, our:

1. Graduate will apply their knowledge and skills to succeed in their careers and / or obtain advanced degrees, provide solutions as entrepreneurs.
2. Graduates will creatively solve problem, communicate effectively, and successfully function in multi-disciplinary teams with superior work ethics and values.
3. Graduates will apply principles and practices of Computer Science, mathematics and Science to successfully complete hardware and/or software-related engineering projects to meet customer.
4. Graduates will have the ability to adapt, contribute innovate modern technologies and systems in the domain of cyber security, IoT or productivity engage in research.

Program Specific Outcomes (PSO's)

1. Able to acquire the practical competency through emerging technologies and open-source platforms related to the areas of Cuber Security, IoT and Blockchain.
2. Able to assess the hardware and software aspects necessary for the development of solutions to secure critical IT infrastructure and prepare collaborative plans for any incidence response.
3. Able to provide diversified solutions in product development by adhering to ethical values for the benefit of society.

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Gandipet, Hyderabad – 75

Department Computer Science and Engineering

Course Outcomes Statements for BE (CSE – IOT& CSBT) R-20

SNO	COURSE		Course Outcomes Statements
	Code	Name	
1	20CSC12	Design and Analysis of Algorithms	Identify and apply asymptotic notations to measure the performance of algorithms.
			Describe the algorithmic design techniques of divide and conquer, greedy, dynamic programming,backtracking and branch and bound to solve problems.
			Apply suitable algorithmic design techniques to solve problems to get optimal solution
			Analyze the performance of algorithmic design techniques.
			Evaluate the efficiency of alternative solutions derived for a problem by applying various algorithmicdesign techniques.
			Understand P, NP, NP-Hard, NP-Completeness and Reducibility.
2	20CSC20	Operating Systems	Identify the basics of an operating systems and its major components.
			Understand the concepts related to process synchronization and deadlocks.
			Distinguish various memory management techniques.
			Interpret various threats and defense mechanisms used to protect the system.
			Evaluate various file allocation methods.
			Apply security as well as recovery features in the design of algorithms.
3	20CIC03	IoT Development, Applications and Practice	Understand Internet of Things, its hardware and software components.
			Illustrate working of I/O devices, sensors & communication module.
			Compare communication protocols in IoT
			Explore fundamentals of IoT Data Analytics and Supporting Services.
			Organize and Analyze IoT data.
			Develop real time IoT based projects.
4	20CIC04	Computer Networks	Understand the communication protocol suites like ISO-OSI and TCP/IP.
			Illustrate Data Communications System and its components.
			Analyze various routing protocol, congestion control algorithms.
			Distinguish the internet protocols like IP, ICMP, IGMP, BGP, OSPF, and DHCP.
			Understand the transport layer protocols like TCP, UDP and SCTP.

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CBIT (A), Gandipet, Hyderabad-500 075.

			Identify the functions of application layer protocols like HTTP, WWW, DNS, Email protocols andSFTP.
5	20CIE01	Linux Kernel Internals and Programming	Understand fundamental concepts of Linux kernel.
			Apply system programming concepts and its library functions.
			Analyze memory management and system administration.
			Create multithreaded programs using POSIX threads.
			Work with file management and system management.
6	**20CIE02**	**IMAGE PROCESSING**	Explain the basic principles of image processing and its significance in real world.
			Interpret various types of images and applies image transformations.
			Evaluate various approaches for image segmentation and image restoration.
			Define image processing methods and recognize morphological image processing techniques.
			Recognize image compression and comprehend image compression techniques in both domains.
			Apply image processing algorithms for real world problems.
7	**20CIE03**	**Artificial Intelligence and Machine Learning**	Understand the significance of AI and Tools.
			Apply regression and classification concepts to real-world problems.
			Perform clustering operations using appropriate algorithms.
			Implement AI concepts using Python.
			Perform predictive analysis using ML algorithms.
			Understand the fundamentals of Deep Learning and Neural Networks.
8	**20CSE05**	**Optimization Techniques**	Calculate the optimum values for given objective function by LPP.
			Solve the solution for maximize the profit with minimum cost by Transportation problem.
			Determine the optimum feasible solution for assignment and travelling

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			salesman problems andcomputing the optimal solution for Job sequencing models.
			Compute the optimum values for given objective function by IPP and optimal strategy for games.
			Identify critical path using network scheduling.
9	**20CSE12**	**Embedded System**	Understand the basics of embedded systems.
			Analyze the core concepts of Embedded System and Embedded System Architecture.
			Design and develop Embedded System hardware and software using Embedded C.
			Analyze the operating system for embedded systems.
			Analyze the embedded system development environment and tools used in embedded softwaredevelopment process.
10	**20ECO10**	**Fundamentals of Wireless Communication**	Understand the overview of Wireless Communication.
			Relate the cellular concepts like frequency reuse, hand off, coverage and capacity.
			Analyse the mobile radio propagation with large scale and small scale fading.
			Select the suitable diversity technique to combat the multipath fading effects.
			Compare the multiple access techniques and apply to wireless standards.
11	**20EEO05**	**Waste Management**	Categorize the waste based on the physical and chemical properties.
			Explain the Hazardous Waste Management and Treatment process.
			Illustrate the Environmental Risk Assessment, methods, mitigation and control.
			Interpret the Biological Treatment of Solid and Hazardous Waste.
			Identify the waste disposal options, describe the design and construction, Operation, Monitoring,Closure of Landfills.
12	**20MEO09**	**Organizational**	Understand Organizational Behavioral

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		Behaviour	principles and practices.
			Compare various organizational designs and cultures enabling organizational development.
			Apply motivational theories and leadership styles in resolving employee,,s problems and decision makingprocesses.
			Understand the group dynamics, communication network, skills needed to resolve organizationalconflicts.
			Analyze the behavior, perception and personality of individuals and groups in organizations in terms ofthe key factors that influence organizational behaviour.
13	**20MTO03**	**Quantum Computing**	Compute basic mathematical operations on Quantum bits.
			Execute Quantum operations of Quantum computing.
			Built quantum programs.
			Develop quantum Logical gates and circuits.
			Develop the quantum algorithm.
14	**20BTO04**	**Bioinformatics**	Explain the basic concepts of biology and bioinformatics
			Identify various types of biological databases used for the retrieval and analysis of the information.
			Explain the sequence analysis and data mining.
			Discuss the methods used for sequence alignment and construction of the phylogenetic tree.
			Describe the methods used for gene and protein structure prediction.
15	**20CSC23**	**Operating System Lab**	Understand Linux/Unix environment.
			Identify and interpret various system programs.
			Understand and implement shell programming.
			Simulate memory management and file allocation techniques.
			Analyze process and file management system calls by creating and/or modifying concurrent programs.
			Build network-oriented applications using system calls.
16	**20CIC05**	**IOT Development, Application and Practical Lab**	Use of various hardware and software components related to Internet of Things.
			Interface I/O devices, sensors to Raspberry Pi/Arduino.
			Implement various communication protocols in IoT.
			Monitoring remote system using IoT.
			Hypothesizing Real time IoT based projects.
			Develop real life IoT based projects.
17	**20CIC06**	**Computer Networks Lab**	Identify the different types of connecting Medias and equipment‟s used in the networks Lab.
			Differentiate various network devices like repeater, hub and switch.
			Practice the basic network commands like ifconfig, ping, traceroute, nslookup, dig, arp, netstat, nmap
			Design and demonstrate network topologies using GNS3
			Examine the packet transfer using tcpdump.
			Analyze the network performance using Wire shark or

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			any tool.
18	**20CIC07**	**Theory of Computer and Compilers**	Understand formal language basics and the power of automata to recognize the languages.
			Analyze the concept compilation Process and data structures of a compiler.
			Attains the knowledge of context free grammars and able to implement parsers.
			Design Syntax directed translation scheme for a given Context free grammar and generation ofintermediate code.
			Apply Optimization to intermediate code and machine code.
			Illustrate various object forms, error recovery and tools of a compiler.
19	**20CSC22**	**Software Engineering**	State the software process and explain perspective process model, evolutionary process models.
			Understand the agile Software process models and demonstrate the skills necessary to specify the requirements of software product so as to prepare SRS document.
			Recall the modeling concepts and estimate the cost of software using empirical models.
			Enlist the design principles and construct a product using coding principles and standards.
			Develop test cases and apply software testing methods in conventional and O-O approaches and estimates software quality of SW.
20	**20CIC08**	**Blockchain Platform and Applications**	Understand the fundamental design and architectural primitives of Blockchain and consensusprotocols.
			Explore various blockchain platforms and identify the significance of smart contracts.
			Identify the working of Ethereum and decentralized applications.
			Implement the blockchain applications with Hyperledger Fabric and Composer.
			Apply blockchain in different application domains such as financial and supply chain sectors.
			Analyze the Implications of blockchain for privacy and security.
21	**20CIE04**	**Sensors and Sensing Technology**	Understand and summarize different types of sensors/transducers.
			Illustrate the mechanism to connect the sensors to processing devices.
			Demonstrate the communication mechanism for IOT sensors.
			Apply different techniques to improve sensor IQ.
			Analyze various aspects of network communication.
			Understand IEEE standards for smart sensing.
22	**20CIE05**	**Vulnerability Analysis and Penetration Testing**	Explain the basic principles and techniques of how attackers can enter computer systems.
			Describe and distinguish key phases of ethical hacking: reconnaissance, scanning, gaining access, maintaining access, and covering the tracks.
			Put acquired knowledge into practice by performing ethical penetration tests and hide the intrusion.
			Experience on various tools & techniques of vulnerability assessment & penetration testing used in

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CBIT (A), Gandipet, Hyderabad-500 075.

			Linux.
			Identify flaws and vulnerabilities in applications, websites, networks, systems, protocols and configurations using both manual techniques and assistive tools.
			Evaluate the strengths and weaknesses of various information technology solutions in terms of data security.
23	**20CSE06**	**Soft Computing**	Understand various soft computing concepts and techniques.
			Analyze and design various learning models.
			Apply the Neural Network Architecture for various Real time applications.
			Examine and approximate reasoning using fuzzy logic
			Design Genetic algorithms in different applications.
			Develop soft computing techniques to solve different applications.
24	**20CSE23**	**Mobile Application Development**	Interpret and analyze Android platform architecture and features to learn best practices in android programming.
			Design the User Interface for mobile applications.
			Apply Intents, Broadcast receivers and Internet services in Android App.
			Develop database management system to retrieve and/or store data for mobile application.
			Evaluate and select appropriate android solutions to the mobile computing platform.
			Build Flutter applications for complex problems.
25	**20CSE37**	**High Performance Computing**	Understand different parallel computing architectures and networks.
			Ability to design parallel algorithms and measure their performance.
			Understand vector processing, memory bottlenecks, data and thread-level parallelism.
			Understand the various programming frameworks like MPI, OpenMP and CUDA.
			Understand cache coherence protocols and read-write semantics of parallel programs.
			Gain knowledge of writing efficient parallel programs.
26	**20ECO01**	**Remote Sensing and GIS**	Demonstrate the understanding of basic concepts of remote sensing and interpret energy interactions.
			Choose an appropriate technique for a given scenario by appreciating the types of remote sensing.
			Distinguish the principle behind the working of microwave and LiDAR sensing.
			Apply Microwave remote sensing techniques.
			Explain the procedure for encoding data and geospatial data analysis.
27	**20MTO01**	**Financial Mathematics**	Calculate the internal rate of return, annuity and amortization.
			Apply the portfolio theory.
			Examine the binomial model of pricing.
			Analyze the stochastic differential equations.
			Solve the BSM partial differential equations.
28	**20EEO02**	**Energy Management**	Know the current Energy Scenario and importance of Energy Conservation.

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CBIT (A), Gandipet, Hyderabad-500 075.

		System	Understand the concepts of Energy Management, Energy Auditing.
			Interpret the Energy Management methodology, Energy security and Energy Strategy.
			Identify the importance of Energy Efficiency for Engineers and explore the methods of improving Energy Efficiency in mechanical systems, Electrical Engineering systems.
			Illustrate the Energy Efficient Technologies in Civil and Chemical engineering systems.
29	**20EGO01**	**Technical Writing Skills**	Communicate effectively, without barriers and understand aspects of technical communication.
			Differentiate between general writing and technical writing and write error free sentences usingtechnology specific words.
			Apply techniques of writing in business correspondence and in writing articles.
			Draft technical reports and technical proposals.
			Prepare agenda and minutes of a meeting and demonstrate effective technical presentation skills.
30	**20CEO02**	**Disaster Risk Reduction and Management**	Identify and understand the concepts of hazards, causes and impacts of disasters.
			Develop a critical capacity to evaluate the principles and practices of disaster risk reduction and management.
			Develop a deep awareness of disaster resilience, risk mitigation, and recovery policies as they arisefrom natural hazards around the globe.
			Apply knowledge about existing global frameworks and existing agreements and role of community insuccessful Disaster Risk Reduction.
			Evaluate DM study including data search, analysis and presentation as a case study.
31	**20CHO04**	**Environment and Sustainable Development**	To relate sustainability concepts and ethical principles towards environment.
			To understand the different types of environmental pollution problems and their respectsustainable solutions.
			To become aware of concepts, analytical methods/models, and resources for evaluating and comparing sustainability implications of engineering activities.
			To critically evaluate existing and new methods.
			To develop sustainable engineering solutions by applying methods and tools to research aspecific system design.
			To apply concepts of sustainable development to address sustainability challenges in a globalcontext.
32	**20EGMO3**	**Universal Human Values-II**	Students are expected to become more aware of themselves and their surroundings (family, society, nature).
			They would become more responsible in life, and in handling problems with sustainable solutions,while keeping human relationships and human nature in mind.
			They would have better critical ability.
			They would also become sensitive to their

Head of the Department
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CBIT (A), Gandipet, Hyderabad-500 075.

			commitment towards what they have understood (humanvalues, human relationship and human society).
			It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
33	**20CSC25**	**Case Studies Using UML Lab**	Identify the problem scope and constraints in the problem.
			Prepare software requirements specifications (SRS) for the system according to standards.
			Apply the design notations of structured approach to develop ER and Data Flow Diagrams.
			Apply/Use the design notations of OO approach to develop UML diagrams using rational tools.
			Implement, analyze and prepare the documentation for the proposed system.
34	**20CIC09**	**Blockchain Platforms and Application Lab**	Understand the fundamental design and architectural primitives of Blockchain and consensusProtocols.
			Deploy various blockchain platforms and identify the significance of smart contracts.
			Implement the working of Ethereum and decentralized applications.
			Implement the blockchain applications with Hyperledger Fabric and Composer.
			Apply blockchain in different application domains such as financial and supply chain sectors.
			Analyze the Implications of blockchain for privacy and security.
35	**20CIE06**	**Sensors and Sensing Technologies Lab**	Strong understanding of fundamentals of Sensing and Sensor Devices
			Illustrate the mechanism to connect the sensors to processing devices.
			Demonstrate the communication mechanism for IoT sensors.
			Design and implement data processing software to utilise sensor data.
			Develop virtual instruments for specific application using LabVIEW software.
			Ease the programming required to make computer interact with real world.
36	**20CIE07**	**Vulnerability Analysis and Penetration Testing Lab**	Install and exploit tools for network protection.
			Exploit and analyse vulnerabilities in LAN, wireless devices and identify the same using penetrationtesting.
			Perform vulnerability scanning and penetration testing using appropriate tools and techniques.
			Perform a wireless pen testing, packet analysis and log analysis.
			Perform static and dynamic analysis on application.
37	**20CSE15**	**Soft Computing Lab**	Implement McCulloh-Pitts model for Boolean operations.
			Apply perceptron learning algorithm for a given problem.
			Design and analyze various Neural Networks Architectures.
			Apply concepts of fuzzy sets on real-time applications.
			Implement Genetic Algorithms with its operators.

Head of the Department
Dept. of Computer Engineering and Technology.
CBIT (A), Gandipet, Hyderabad-500 075.

			Apply soft computing strategies for various real time applications.
38	**20CSE32**	**Mobile Application Development Lab**	Analyze all the components and their properties of various Emulators for selecting suitable emulator.
			Apply essential Android programming concepts for developing efficient mobile app.
			Develop Android applications related to various layouts
			Design Flutter applications with rich user interactive interfaces.
			Develop Android applications related to mobile related server-less database like SQLite.
			Extend event handling to develop various mobile applications.
39	**20CSE40**	**High Performance Computing Lab**	Apply System Commands and Networking commands of Linux.
			Describe OpenMP constructs and functions.
			Design and implement parallel programs using OpenMP.
			Apply the APIs in MPI programming.
			Design and implement parallel programs using CUDA.
40	**20EGCO3**	**Employability Skills**	Become effective communicators, participate in group discussions with confidence and be able to make presentations in a professional context.
			Write resumes, prepare and face interviews confidently.
			Be assertive and set short term and long term goals, learn to manage time effectively and deal withstress.
			Make the transition smoothly from campus to work, use media with etiquette and understand theacademic ethics.
			Enrich their vocabulary, frame accurate sentences and comprehend passages confidently.
41	**20EEC01**	**Basic Electric Engineering**	Understand the concepts of Kirchhoff's laws and to apply them in superposition, Thevenin's and Norton's theorems to get the solution of simple dc circuits.
			Obtain the steady state response of RLC circuits with AC input and to acquire the basics, relationship between voltage and current in three phase circuits.
			Understand the principle of operation, the emf and torque equations and classification of AC and DC machines.
			Explain various tests and speed control methods to determine the characteristic of DC and AC machines.
			Acquire the knowledge of electrical wiring, types of wires, cables used and Electrical safety precautions to be followed in electrical installations.
			Recognize importance of earthing, methods of earthing and various low-tension switchgear used in electrical installations.
42	**20ECC35**	**Basic Electronics**	Interpret the usage of semiconductor devices in making circuits like rectifiers, filters, regulators etc.
			Design and Analyse the characteristics of electronic circuits and systems.
			Make use of various types of small and large signal

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CBIT (A), Gandipet, Hyderabad-500 075.

			amplifiers for electronic control systems.
			Model a prototype module using the operational amplifier for real time applications.
			Evaluate the performance of various semiconductor devices.
43	**20CSC08**	**Data Structures**	Understand the basic concepts of data structures and sorting techniques.
			Analyze the performance of algorithms.
			Distinguish between linear and non-linear data structures.
			Apply linear and non-linear data structures.
			Identify the significance of balanced search trees, graphs and hashing.
			Establish a suitable data structure for real world applications.
44	**20CSC09**	**Discrete Mathematics**	Describe rules of inference for Propositional and Predicate logic.
			Demonstrate use of Set Theory, Venn Diagrams, relations, and functions in Real-world scenarios.
			Model solutions using Generating Functions and Recurrence Relations.
			Determine the properties of graphs and trees to solve problems arising in computer science applications.
			Distinguish between groups, semi groups and monoids in algebraic systems.
			Formulate solutions to a variety of real world problems.
45	**20CSC10**	**Digital Logic Design**	Demonstrate the number system conversions and simplify Boolean functions.
			Recall basic theorems and properties of Boolean algebra to represent logical functions in canonical and standard forms.
			Analyze and simplify Boolean expressions using karnaugh-maps and tabulation method.
			Analyze and Design various combinational circuits and Sequential circuits used in Computer Hardware.
			Understand the designs of Combinational and Sequential circuits using Verilog HDL.
			Develop different applications by configuring registers, counters and memories.
46	**20CIC01**	**Fundamentals of Cyber security and Tools**	Discuss different types of cybercrimes and analyze legal frameworks to deal with these cybercrimes.
			Describe the usage of Tools in cybercrimes.
			Recognize the importance of digital evidence in prosecution.
			Analyze and resolve cyber security issues in various domains.
			Analyze the commercial activities in the event of significant information security incidents in the Organization.
			Understand the importance of Cyber Laws and their Legal perspective.
47	**20EEC02**	**Basic Electrical Engineering Lab**	Get an exposure to common electrical components, their ratings and basic electrical measuring equipment.
			Make electrical connections by wires of appropriate ratings and able to measure electric power and energy.
			Comprehend the circuit analysis techniques using various circuital laws and theorems.

Head of the Department
Dept. of Computer Engineering and Technology.
CBIT (A), Gandipet, Hyderabad-500 075.

			Determine the parameters of the given coil and calculate the time response of RL & RC series circuits
			Recognize the basic characteristics of transformer and components of switchgear.
			Understand the basic characteristics of dc and ac machine by conducting different types of tests on them.
48	**20CSC11**	**Data Structures Lab**	Implement the abstract data type.
			Implement linear data structures such as stacks, queues using array and linked list.
			Implement non-linear data structures such as trees, graphs.
			Analyze various sorting techniques.
			Analyze various algorithms of linear and nonlinear data structures.
			Design and develop real world problem using suitable data structures.
49	**20CIC02**	**Fundamentals of Cyber Security and Tools Lab**	Use Foot Printing Tools for Information Gathering.
			Scan and scrutinize the information gathered.
			Understand the usage of Sniffer Tools.
			Become familiar with Attack Launching Tools.
			Configure the proactive defense system.
50	**20CII01**	**Moocs /Training / Internship**	On Successful completion of this course, student will be able to.
51	**20MTC13**	**Mathematical Foundation for Data Science & Security**	Analyze the coefficient of skewness and fitting of the data by various methods.
			Apply properties of Mathematical Expectations and analyse the various distributions.
			Evaluate areas of curves by using various distributions.
			Apply various technics of Number Theory for solving problems.
			Apply RSA –PKC for solving security issues.
52	**20CSC13**	**Computer Architecture and Microprocessor**	Understand the functional block diagram of single bus architecture of a computer and describe the function of the instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set.
			Design assembly language program for specified computing 16 bit multiplication, division and I/O device interface.
			Derive flowchart for Concurrent access to memory and cache coherency in Parallel Processors and describe the process.
			Design a memory module and analyze its operation by interfacing with the CPU
			Apply design techniques to enhance performance using pipelining, parallelism and RISC methodology.
			Develop testing and experimental procedures on Microprocessor and analyze their operation under different cases.
53	**20CSC14**	**Data Base Management System**	Classify the difference between FMS and DBMS; describe the roles of different users and the structure of the DBMS .Design the database logically using ER modelling.
			Outline the schema of the relational database and key constraints.Develop queries using fundamental ,extended operators of relational algebra and DDL, DML and DCL of SQL.

Head of the Department
Dept. of Computer Engineering and Technology.
CBIT (A), Gandipet, Hyderabad-500 075.

			Explore the inference rules for functional dependencies and apply the principles of normal forms to decompose the relations in a database.
			Summarize the concepts of dense ,sparse ,ISAM and B+ tree indexing and get familiar with static and extendable techniques of hashing.
			Explain the states and properties of transaction. Interpret the locking, time stamp, graph and validation based protocols for concurrency control**.**
			Relate log based, ARIES recovery techniques to increase the robustness of the database, identify to resolve the deadlocks in the transaction.
54	**20CSC15**	**Internet & Web Technology**	Understand the technologies required for developing web application.
			Identify and choose XHTML tags, CSS and java scripts to develop well structured and easily maintained web pages.
			Design and Develop interactive and innovative web pages using various platforms/technologies like XHTML, CSS, XML, JAVASCRIPT.
			Create and deploy web applications in web server by using server-side programming concepts like Python.
			Build a data driven web site using different frameworks and Databases.
			Evaluate different web applications to implement optimal solutions for real time problems.
55	**20CSC36**	**Introducing AI Tools, Techniques and Applications**	Understand fundamental concepts of AI and its importance.
			Identify various Machine Learning algorithms and their limitations.
			Develop Chatbots based on requirements.
			Analyze complex problems involving image processing, Computer Vision and HCI..
			Understand smart solutions for various domains.
56	**20MBC01**	**Engineering Economics & Accountancy**	Apply fundamental knowledge of Managerial Economics concepts and tools.
			Analyze various aspects of Demand Analysis, Supply and Demand Forecasting.
			Understand Production and Cost relationships to make best use of resources available.
			Apply Accountancy Concepts and Conventions and preparation of Final Accounts.
			Evaluate Capital and Capital Budgeting decision based on any technique..
57	**20MTC14**	**Mathematical Foundation for Data Science & Security Lab**	Create graphs and charts for the statistical data
			Analyze the data set using measures of central tendency and dispersion.
			Develop the linear and non-linear regression models for the statistical data.
			Evaluate the probabilities of various discrete and continuous distributions.
			Demonstrate RSA – PKC technique of number theory for solving security issues.
58	**20CSC17**	**Data Base Management Systems Lab**	Outline the built-in functions of SQL and apply these functions to write simple and complex queries using SQL operators.
			Demonstrate Queries to Retrieve and Change Data using Select, Insert, Delete and Update. Construct Queries using Group By, Order By and Having Clauses.

Head of the Department
Dept. of Computer Engineering and Technology.
CBIT (A), Gandipet, Hyderabad-500 075.

			Demonstrate Commit, Rollback, Save point commands, SQL Plus Reports and formulate the Queries for Creating, Dropping and Altering Tables, Views, constraints.
			Develop queries using Joins, Sub-Queries and Working with Index, Sequence, Synonym, Controlling Access and Locking Rows for Update, Creating Password and Security features.
			Demonstrate the usage of data types, Bind and Substitution Variables, Anchored, Declarations, Assignment Operation and PL/SQL code using Control Structures
			Develop PL/SQL code using Cursors, Exception, Composite Data Types and Procedures, Functions and Packages.
59	**20CSC18**	**Internet & Web Technologies Lab**	Identify and install web development tools.
			Develop client side web pages using XHTML , CSS and XML.
			Create dynamic, interactive web applications using java script.
			Develop server side web application using Django Frame work.
			Understanding working of Ajax, Node.js and JSON.
			Identify and explore different frame works for web applications.
60	**20CSC37**	**Introducing AI Tools, Techniques and Applications Lab**	Demonstrate the capabilities of AI.
			Build models for various real time problems using AI/ML Tools.
			Develop Chatbots, programs for simple applications.
			Analyze and interpret the experimentation results.
			Develop skills to communicate the experimentation results.
61	**22MTC01**	**Linear Algebra & Calculus**	Determine the extreme values of functions of two variables.
			Apply the vector differential operator to scalar and vector functions.
			Solve line, surface & volume integrals by Greens, Gauss and Stoke's theorems.
			Determine the basis and dimension of a vector space, compute linear transformation.
			Apply the Matrix Methods to solve the system of linear equations.
62	**22PYC01**	**Optics and Semiconductor Physics**	Demonstrate the physical properties of light.
			Explain characteristic properties of lasers and fiber optics.
			Find the applications of quantum mechanics.
			Classify the solids depending upon electrical conductivity.
			Identify different types of semiconductors.
63	**22CSC01**	**Problem Solving And Programming**	Understand real world problems and develop computer solutions for those problems.
			Understand the basics of Python.
			Apply Python for solving basic programming solutions.
			Create algorithms/flowcharts for solving real-time problems.
			Build and manage dictionaries to manage data.
			Handle data using files.

Head of the Department
Dept. of Computer Engineering and Technology.
CBIT (A), Gandipet, Hyderabad-500 075.

64	**22EGC01**	**English**	Illustrate the nature, process and types of communication and communicate effectively without barriers.
			Construct and compose coherent paragraphs, emails and adhering to appropriate mobile etiquette.
			Apply techniques of precision to write a précis and formal letters by using acceptable grammar and appropriate vocabulary.
			Distinguish formal from informal reports and demonstrate advanced writing skills by drafting formal reports.
			Critique passages by applying effective reading techniques.
65	**22PYC03**	**Optics and Semiconductor Physics Lab**	Interpret the errors in the results of an experiment.
			Demonstrate physical properties of light experimentally.
			Make use of lasers and optical fibers for engineering applications.
			Explain the V-I characteristics of some optoelectronic and semiconductor devices.
			Find the applications thermistor.
66	**22EGC02**	**English lab**	Define the speech sounds in English and understand the nuances of pronunciation in English.
			Apply stress correctly and speak with the proper tone, intonation and rhythm.
			Analyze listening comprehension texts to enhance their listening skills.
			Determine the context and speak appropriately in various situations.
			Design and present effective posters while working in teams ,and discuss and participate in Group discussions.
67	**22CSC02**	**Problem Solving and Programming Lab**	Understand various Python program development Environments.
			Demonstrate the concepts of Python.
			Implement algorithms/flowcharts using Python to solve real-world problems.
			Build and manage dictionaries to manage data.
			Write Python functions to facilitate code reuse.
			Use Python to handle files and memory.
68	**22MEC01**	**CAD AND DRAFTING**	Become conversant with appropriate use of CAD software for drafting.
			Recognize BIS, ISO Standards and conventions in Engineering Drafting.
			Construct the projections of points, lines, planes, solids.
			Analyse the internal details of solids through sectional views.
			Create an isometric projections and views.
69	**22MEC38**	**Digital Fabrication Lab**	Understand safety measures to be followed in workshop to avoid accidents.
			Identify various tools used in fitting, carpentry, tin smithy, house wiring, welding, casting and machining processes.
			Make a given model by using workshop trades including fitting, carpentry, tinsmithy and House wiring.
			Perform various operations in welding, machining and

Head of the Department
Dept. of Computer Engineering and Technology.
CBIT (A), Gandipet, Hyderabad-500 075.

			casting processes.
			Conceptualize and produce simple device/mechanism of their choice.
70	**22MTC04**	**Differential Equations & Numerical Methods**	Calculate the solutions of first order linear differential equations.
			Calculate the solutions of higher order linear differential equations.
			Solve the algebraic, transcendental and system of equations.
			Apply interpolation and numerical differentiation techniques for given data.
			Test the convergence and divergence of Infinite series.
71	**22CYC01**	**Chemistry**	Identify the microscopic chemistry in terms of molecular orbitals, intermolecular forces and rate of chemical reactions.
			Discuss the properties and processes using thermodynamic functions, electrochemical cells and their role in batteries and fuel cells.
			Illustrate the major chemical reactions that are used in the synthesis of organic molecules.
			Classify the various methods used in treatment of water for domestic and industrial use.
			Outline the synthesis of various Engineering materials & Drugs.
72	**22EEC01**	**Basic Electrical Engineering**	Understand the concepts of Kirchhoff's laws and their application various theorems to get solution of simple dc circuits.
			Predict the steady state response of RLC circuits with AC single phase/three phase supply.
			Infer the basics of single phase transformer.
			Describe the construction, working principle of DC machine and 3-phase Induction motor.
			Acquire the knowledge of electrical wires, cables, earthing, Electrical safety precautions to be followed in electrical installations and electric shock and its safety and energy calculations.
73	**22CSC03**	**Object Oriented Programming**	Understand the concepts of Object-Oriented features.
			Apply OOPs concepts and different libraries to solve programming problems.
			Understand the advanced concepts of Python.
			Develop programs to access databases and web data.
			Understand APIs and third-party libraries to be used with Python.
74	**22CYC02**	**Chemistry Lab**	Identify the basic chemical methods to analyse the substances quantitatively & qualitatively.
			Estimate the amount of chemical substances by volumetric analysis.
			Determine the rate constants of reactions from concentration of reactants/ products as a function of time.
			Calculate the concentration and amount of various substances using instrumental techniques.
			Develop the basic drug molecules and polymeric compounds.
75	**22MBC02**	**Community Engagement**	Gain an understanding of Rural life, Culture and Social realities.
			Develop a sense of empathy and bonds of mutuality with

Head of the Department
Dept. of Computer Engineering and Technology.
CBIT (A), Gandipet, Hyderabad-500 075.

			Local Communities.
			Appreciate significant contributions of Local communities to Indian Society and Economy.
			Exhibit the knowledge of Rural Institutions and contributing to Community's Socio-Economic improvements.
			Utilise the opportunities provided by Rural Development Programmes.
76	**22CSC04**	**Object-Oriented Programming Lab**	Demonstrate the features of Object-Oriented Programming.
			Understand APIs and third-party libraries to be used with Python.
			Use Python libraries to solve real-world problems.
			Write scripts to solve data science/machine leaning problems using NumPy and Pandas.
			Develop applications by accessing web data and databases.
77	**22MEC37**	**Robotics & Drones Lab**	Demonstrate knowledge of the relationship between mechanical structures of robotics and their operational workspace characteristics.
			Understand mechanical components, motors, sensors and electronic circuits of robots and build robots.
			Demonstrate knowledge of robot controllers.
			Use Linux environment for robotic programming.
			Write Python scripts to control robots using Python and Open CV.
78	**22EEC02**	**Basic Electrical Engineering Lab**	Comprehend the circuit analysis techniques using various circuital laws and theorems.
			Analyse the parameters of the given coil and measurement of power and energy in AC circuits.
			Determine the turns ration/performance parameters of single-phase transformer.
			Infer the characteristics of DC shunt motor different tests.
			Illustrate different parts and their function of electrical components, equipment and machines.

Head of the Department
Dept. of Computer Engineering and Technology.
CBIT (A), Gandipet, Hyderabad-500 075.