

COMMITTED TO RESEARCH, INNOVATION AND EDUCATION YEARS

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 problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

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

The engineer 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.

Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Communication: Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a 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 (PEOs): After the completion of the program, our:

- 1. Graduates 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 problems, 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 business objectives
- 4. Graduates will have the ability to adapt, contribute, innovates modern technologies and systems in the domain of Cyber Security, IoT or productively engage in research

Program Specific Outcomes (PSOs): At the end of the program

- 1. Acquire the practical competency through emerging technologies and open-source platforms related to the areas of Cyber Security, IoT, and Blockchain
- 2. 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. Provide diversified solutions in product development using standard engineering Practices

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (Autonomous)

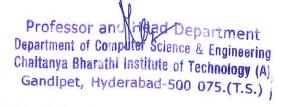
Gandipet, Hyderabad -75

Department of Computer Science and Engineering Course Outcomes Statements for BE (CSE - IOT&CSBT)-R20

	1	Course	
S.No	Code	Name	Course Outcomes Statements
		Tune	Apply the Matrix Methods to solve the system of linearequations
1.	20MT C01	Linear Algebra &	Test the convergence and divergence of the infinite Series.
		Calculus	Determine the extreme values of functions of two variables.
			Apply the vector differential operator to scalar and vectorfunctions Solve line, surface & volume integrals by Greens,
			Gauss andStoke's theorems.
			Illustrate the nature, process and types of communication and communicate effectively without barriers.
2.	20EG C01	English	Construct and compose coherent paragraphs, emails and adhering to appropriate mobile etiquette.
2.	2014 C01	English	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
			Demonstrate the physical properties of light.
3.	20PY C01	Optics and SemiconductorPhysics	Explain characteristic properties of lasers and fiber optics
٥.			Find the applications of quantum mechanics Classify the solids depending upon electrical conductivity
			Identify different types of semiconductors
			Identify and understand the computing environments for scientific and mathematical problems.
		Programming for	Formulate solutions to problems with alternate approaches and represent them using algorithms / Flowcharts.
4.	20CS C01	Problem Solving	Choose data types and control structures to solve mathematical and scientific problem.
			Decompose a problem into modules and use functions to implement the modules.
			Apply arrays, pointers, structures, and unions to solve mathematical and scientific problems.
			Develop applications using file I/O.
	20MT C02		Apply the Matrix operations in executing various programmes.
5.		Linear Algebra & Calculus Lab	Test the convergence and divergence of the infinite Series.
		Culturus Lab	Explore the extreme values of functions of two variables.
			Determine the gradient, divergent and our of scalar and
			vector point functions.

			Solve line, surface & volume integrals by Greens, Gauss and Stoke's theorems.
			Define the speech sounds in English and understand the nuances of pronunciation in English
6.	20EG C02	English lah	Apply stress correctly and speak with the proper
0.	2010 002	English lab	tone, intonation and rhythm.
			Analyze IELTS and TOEFL 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.
			Interpret the errors in the results of an experiment.
			Demonstrate physical properties of light experimentally
7.	20PY C03	Optics and	Make use of lasers and optical fibers for engineering
/.	201 1 003	SemiconductorPhysics Lab	
		Dub	Explain the V-I characteristics of some optoelectronic and semiconductor devices
			Find the applications thermistor
			Identify and setup program development environment.
			Design and test programs to solve mathematical and
			scientific problems.
8.	20CS C02	Programming for	Identify and rectify the syntax errors and debug program
		problem Solving Lab	for semantic errors
			Implement modular programs using functions.
			Represent data in arrays, pointers, structures and manipulate them through a program.
			Create, read, and write to and from simple text files.
			Become conversant with appropriate use of CAD
	1		software for drafting.
	20147 001	CAD AND DRAFTING	Recognize BIS, ISO Standards and conventions in
9.	20ME C01	CHE THIS BITTI THIS	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
			Gain an understanding of Rural life, Culture and Social
			realities.
			Develop a sense of empathy and bonds of mutuality with
10.	20MB C02		Local Communities.
10.	20MB C02	Community	Appreciate significant contributions of Local
		Engagement	communities to Indian Society and Economy.
			Exhibit the knowledge of Rural Institutions and contributing to Community's Socio-Economic
			contributing to Community's Socio-Economic improvements.
			Utilise the opportunities provided by Rural Development
	_		Programmes.
			Calculate the solutions of first order linear differential
			equations.
11.	20MT C03	Differential Equations 9	Calculate the solutions of higher order linear differential
	20 003	Transform Theory	equations.
			Examine the series solutions for higher order differential equations.
			Evaluate the Improper integrals by Fourier Transform.
			Transform.

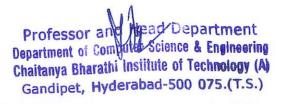
			Solve the difference equations by 7 transforms
	-		Solve the difference equations byZ-transforms. Identify the microscopic chemistry in terms of molecular
12.	20CYC01	Chemistry	orbitals, intermolecular forces and rate of chemical
			reactions.
			Discuss the properties and processes using
			thermodynamic 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.
			Identify the key drivers and enablers of Industry4.0
			Describe the smartness in smart factories, smart cities,
			smart products, ad smart services
13.	20CS C05	Industry 4.0	Determine various systems used in manufacturing plants,
13.	2005 005	maustry 4.0	and their role in an Industry 4.0world
	1		Illustrate the power of Cloud Computing in a networked
		1	Linderstand the concentration about
			Understand the opportunities, challenges, brought about by Industry 4.0 and how organizations and individuals
	1	1	should prepare to reap the benefits
			Demonstrate the concepts of Object-Oriented
			Programming languages to solve problems.
		1	Apply the constructs like selection, repetition, functions
			and packages to modularize the programs.
14.	20CS C03	Object Oriented	Design and build applications with classes/modules.
		Programming	Find and rectify coding errors in a program to assess and
			improve performance.
			Develop packages for solving simple real world
			problems.
			Analyze and use appropriate library software to create
			graphical interface, mathematical software.
			Explore all the possible solutions of first order differential equation.
		Differential Equations	Analyse the solutions of higher order linear differential
15.	20MT C04	&Transform Theory	equations.
	envisoroused distriby V	Lab	Examine the series solutions for higher order differential
		265-4500 m255	equations.
			Evaluate the Improper integrals by Fourier Transform.
			Apply the Z-transform to solve the difference equations.
			Identify the basic chemical methods to analyse the
•	1	1	substances quantitatively & qualitatively.
			Estimate the amount of chemical substances by
			volumetric analysis.
16.	20CYC02	Chemistry Lab	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.
			Inspect and identify suitable programming environment
17.	20CSC04	Object Oriented	to work with Python.
	2000004	Joject Oriented	Choose appropriate control constructs, data structures to



		Programming Lab	build the solutions.
		1 rogramming Lab	
			Develop the solutions with modular approach using
			functions, packages to enhance the code efficiency.
		1	Analyze and debug the programs to verify and validate code.
1			Demonstrate use of STLs and modules to build graphical interfaces, mathematical software.
		1	
			Determine the requirements of real-world problems and
			use appropriate modules to develop solutions.
			Understand safety measures to be followed in workshop to avoid accidents.
	1		Identify various tools used in fitting, carpentry, tin
		Workshop /	smithy, house wiring, welding, casting and machining
18.	20ME C02	Manufacturing Practice	processes.
			Make a given model by using workshop trades including
1			fitting, carpentry, tinsmithy and House wiring.
			Perform various operations in welding, machining and
			casting processes.
			Conceptualize and produce simple device/mechanism of
			their choice.
			Understand the role of an engineer as a problem solver.
		1	Identify multi-disciplinary approaches in solving an
			engineering problem.
19.	20ME C03	Engineering Exploration	
			Analyze engineering solutions from ethical and
		1	sustainability perspectives.
			Use basics of engineering project management skills in
			doing projects.
			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
20.	20EEC01	D . El	voltage and current in three phase circuits.
20.	20EEC01	Basic Electrical	Understand the principle of operation, the emf and torque
		Engineering	equations and classification of AC and DC machines
		1	Explain various tests and speed control methods to
			determine the characteristic of DC and AC machines.
	1	1	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
			Interpret the usage of semiconductor devices in making
			circuits like rectifiers, filters, regulators etc
			Design and Analyse the characteristics of electronic
21.	20ECC35	Basic Electronics	circuits and systems
		_	Make use of various types of small and large signal
		}	amplifiers for electronic control systems.
			Model a prototype module using the operational amplifier for real time applications.
1		H	Evaluate the porfermence of
			Evaluate the performance of various semiconductor devices.
			Understand the basic concepts of data structures and

			T
22.	2000000	D. C.	sorting techniques.
22.	20CSC08	Data Structures	Analyze the performance of algorithms.
		1	Distinguish between linear and non-linear data structures.
	1		Apply linear and non-linear data structures.
	1		Identify the significance of balanced search trees, graphs
		1	and hashing.
			Establish a suitable data structure for real world
			applications.
			Describe rules of inference for Propositional and
			Predicate logic.
			Demonstrate use of Set Theory, Venn Diagrams,
			relations, functions in Real-world scenarios.
23.	20CSC09	Discrete Mathematics	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. Demonstrate the number system conversions and
		1	y und
		1	simplify Boolean functions.
	4		Recall basic theorems and properties of Boolean algebra
	1	1	to represent logical functions in canonical and standard forms.
24.	20CSC10	Digital Logic Design	
	20000.0	Digital Bogic Besign	Analyze and simplify Boolean expressions using karnaugh- maps and tabulation method.
		1	Analyze and Design various combinational circuits and
		l'	Sequential circuits used in Computer Hardware.
			Understand the designs of Combinational and Sequential
			circuits using Verilog HDL.
			Develop different applications by configuring registers,
	0		counters and memories.
25.	20CIC01	Fundamentals of Cyber	
	W. 2000 CO.	Security And Tools	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.
			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.
		Donie Elect '	Comprehend the circuit analysis techniques using various
26.	20EEC02	Basic Electrical	circuital laws and theorems.
		Engineering Lab	Determine the parameters of the given coil and calculate
			the time response of RL & RC series circuits
			Recognize the basic characteristics of transformer and
1			components of switchgear
			Understand the basic characteristics of dc and ac machine
			and ac machine

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interfacing with the CPU. Apply design techniques to enhance performance using				
Apply design techniques to enhance performance using				interfacing with the CPU.
1 11 2			<u> </u>	Apply design techniques to enhance performance using
pipelining, parallelism and RISC methodology.				pipelining, parallelism and RISC methodology
Develop testing and avanimental and 1				Develop testing and experimental procedures
Microprocessor and analyze their operation and				Microprocessor and analyze their operation under
different cases.		l.		different cases.
Classify the difference between FMS and DBMS				



describe the roles of different	
the DBMS .Design the data	abase logically using ER
modeling.	1000 TODA
Outline the schema of the re	elational database and key
constraints. Develop queries us	sing fundamental, extended
33. 20CSC14 Data Base Management operators of relational algebra	
Systems of SQL.	
Explore the inference rules for	or functional dependencies
and apply the principles of no	
the relations in a database.	•
Summarize the concepts of de	nse ,sparse ,ISAM and B+
tree indexing and get familiar	
techniques of hashing.	
Explain the states and properti	es of transaction. Interpret
the locking, time stamp, gra	
protocols for concurrency contri	
Relate log based, ARIES recov	very techniques to increase
the robustness of the databas	e, identify to resolve the
deadlocks in the transaction.	
Understand the technologies re	quired for developing web
application.	
Identify and choose XHTML t	ags, CSS and java scripts
to develop well-structured an	d easily maintained web
pages.	
Internet & Web Design and Develop interact	ive and innovative web
34. 2005C15 Technologies pages using various platforms/t	echnologies like XHTML,
CSS, XML, JAVASCRIPT.	
Create and deploy web applied	cations in web server by
using server-side programming	concepts like Python.
Build a data driven web site us	sing different frameworks
and Databases.	
Evaluate different web applicate	
solutions for real time problems	
Understand fundamental cor	ncepts of AI and its
importance.	
Introduction to AI limitations	ning algorithms and their
35. 2009036	
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i i i i i i i i i i i i i i i i i i i	olving image processing,
Computer Vision and HCI	
Understand smart solutions for v	
Apply fundamental knowledge	of Managerial Economics
concepts and tools.	
Analyze various aspects of Dem	and Analysis, Supply and
Engineering Economics Demand Forecasting. 36. 20MBC01 & Accountancy Understand Production and Co.	
Charles and Floaticion and Co	st relationships to make
best use of resources available.	A2X
Apply Accountancy Concepts	and Conventions and
preparation of Final Accounts.	and the state of t
Evaluate Capital and Capital E	Budgeting decision based
on any technique.	
Analyze the coefficient of ske	wness and fitting of the
data by various methods	
Mathematical Apply properties of Mathematicans analyze the various distributions	atical Expectations and

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		Science & Security Lab	
			Apply various technics of Number Theory for solving problems
		1	Apply RSA –PKC for solving security issues.
		<u> </u>	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
	Ī		using Group By, Order By and Having Clauses.
		Data Base Management	
38.	20CSC17	SystemsLab	SQL Plus Reports and formulate the Queries for
36.	2003017	SystemsLab	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.
			Identify and install web development tools.
			Develop client side web pages using XHTML, CSS and
			XML.
		Internet & Web	Create dynamic, interactive web applications using java
39.	20CSC18	Technologies Lab	script.
			Develop server side web application using Django Frame
			work.
			Understanding working of Ajax, Node.js and JSON.
			Identify and explore differentframe works for
			web applications.
		Introduction to AT	Demonstrate the capabilities of AI
40.	2000027	Introduction to AI	Build models for various real time problems using
70.	20CSC37	tools, Techniques and Applications Lab	AI/ML Tools
		Applications Lau	Develop Chatbots, programs for simple applications
			Analyze and interpret the experimentation results
		1	Develop skills to communicate the experimentation results
			resuits
41.	20ACT	Activity Points	
	20/101	Activity roints	
	(
			Identify and apply as
			Identify and apply asymptotic notations to measure the performance of algorithms.
			Describe the elegrishmis.
			Describe the algorithmic design techniques of divide and
			conquer, greedy, dynamic programming, backtracking
			and branch and bound to solve problems.
42.	20CSC12	Design and Analysis of	Apply suitable algorithmic design techniques to solve problems to get optimal solution.
		_ 55.6.1 4.14 7 1141 7 513 01	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 algorithmic design techniques. Understand P, NP, NP-Hard, NP-Completeness and Reducibility. 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. Understand Internet of Things, its hardware and software components. Illustrate working of I/O devices, sensors & communication module. Compare communication proteocls in IoT. Explore fundamentals of IoT Data Analytics and Supporting Services. Organize and Analyze IoT data. Develop real time IoT based projects. Understand the communications System and its components. Analyze various routing proteocl, congestion control algorithms. Distinguish the internet proteocls like IP, ICMP, IGMP, BGP, OSPF, and DHCP. Understand the transport layer protocols like TCP, UDP and SCTP. Identify the functions of application layer protocols like HTTP, WWW, DNS, Email protocols and understand fundamental concepts of Linux kernel. Apply system programming concepts and its library functions. Work with file management and system management. 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 methods and recognize morphological image compression and comprehend image		r	A 1 2-1	Analysis the southerness of classicalists decision
43. 20CIC03 Operating Systems 44. 20CIC03 In Development, Applications and Practice 45. 20CIC04 Computer Networks 46. 20CIC01 Linux Kernel Internals and Programming Evaluate various of alternatory management and system and its image roccessing whose protocoles in long the functions. Analyze various or protocoles like Pt. ICMP, IGMP, BGP, OSPF, and DHCP. Linux Kernel Internals and Programming Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Programming concepts and its library functions. Linux Kernel Internals and Program internations and its conce			Algorithms	
43. 20CSC20 Operating Systems Operating Systems and its major components. 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. Illustrate Data Communication methods. Operating Systems Operating Systems Operating Systems Operating Systems Operating Systems and its Interpret Systems. Operating Systems of Interpret Systems Operating Systems and Its and System operating Systems on the design of algorithms. Operating Systems Operating Systems of Interpret Systems Operating Systems on Operating Systems and its Interpret Systems Operating Systems Operating Systems on Operating Systems and Its Interpret Systems Operating Systems Operating Systems Operating Systems of Interpret Systems of Interpret Systems Operating Systems Operating Systems Operating Systems on Operating Systems and Its Interpret Systems Operating S				Evaluate the efficiency of alternative colutions derived
43. 20CSC20 Operating Systems 43. 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 file allocation methods. Apply security as well as recovery features in the design of algorithms. Understand Internet of Things, its hardware and software components. Illustrate working of I/O devices, sensors & communication module. Compare communication protocols in IoT. Compare communication protocols in IoT. Compare 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. Identify the functions of application layer protocols like HTTP, WWW, DNS, Email protocols and Understand fundamental concepts of Linux kernel. Apply system programming concepts and its library functions. Create multithreaded programs using POSIX threads. Analyze memory management and system administration. Create multithreaded programs using POSIX threads. Analyze memory management and system administration. Create multithreaded programs using POSIX threads. Explain the basic principles of image segmentation and image restoration. Define image processing methods and recognize morphological image processing techniques.				for a problem by applying various algorithmic design
43. 20CSC20 Operating Systems Operating Systems Operating 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. 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. Understand the concepts of Data Analytics and Supporting Services. Osl 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 TTCP, UDP and SCTP. Identify the functions of application layer protocols like HTTP, WWW, DNS, Email protocols and Understand fundamental concepts of Linux kernel. Analyze memory management and system administration. Create multithreaded programs using POSIX threads. Analyze memory management and system administration. Create multithreaded programs using POSIX threads. Evaluate various approaches for image segmentation and image restoration. Define image processing methods and recognize morphological image processing techniques.				
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Recognize image compression and comprehend image				morphological image processing techniques.
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48. 20CIE03 Artificial Intelligence and Machine Learning Deform predictive analysis using ML algorithms. 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 aslessman problems and computing the optimal solution for Job sequencing models. Compute the optimum values for given objective function by LPP and optimal strategy for games. Identify critical path using network scheduling Understand the basics of embedded system and Embedded System Architecture. Design and develop Embedded System hardware and soffware using Embedded Continuous Architecture. Design and develop Embedded System hardware and soffware using Embedded System Hore embedded systems. Analyze the operating system for embedded systems. Analyze the operating system for embedded systems with a continuous and the solution for a sign and the solution for assignment and tools used in embedded software development process. Understand the overview of Wireless Communication. Relate the cellular concepts like frequency reuse, hand off, coverage and capacity. Analyze 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. Co				
48. 20CIE03 Artificial Intelligence and Machine Learning Herform clustering operations using appropriate algorithms. Independent Al concepts using Python. Perform clustering operations using appropriate algorithms. Independent Al concepts using Python. Perform predictive analysis using ML algorithms. Understand the fundamentals of Deep Learning and Neural Networks. 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 reasible solution for assignment and travelling salesman problems and computing the optimal solution for Job sequencing models. Compute the optimum values for given objective function by LPP and optimal strategy for games. Identify critical path using network scheduling Understand the basis of embedded systems. Analyze the core concepts of Embedded System and Embedded System Architecture. Design and develop Embedded System for embedded systems. Analyze the embedded system development environment and tools used in embedded system development process. Understand the overview of Wireless Communication. Relate the cellular concepts like frequency reuse, hand off, coverage and capacity. Analyze the operation system for embedded systems. Analyze the operation problem. Relate the cellular concepts like frequency reuse, hand off, coverage and capacity. Compute the multiple access techniques and apply to wireless standards. 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. Landfills. Understand Organizational Behavioral principles and practices. Compare various organizational designs and cultures.				
Artificial Intelligence and Machine Learning Implement Al concepts using Python. Perform redictive analysis using ML algorithms. Calculate the optimum values for given objective function by LPP. Solve the solution for maximize the profit with minimum cost by Transportation problems. Determine the optimum values for given objective function by LPP. Solve the solution for maximize the profit with minimum cost by Transportation problems. Determine the optimum values for given objective function by LPP. Solve the 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 Understand the basics of embedded System and Embedded System Architecture. Design and develop Embedded System hardware and software using Embedded System development environment and tools used in embedded software development process. Communication Fundamentals of Wireless Communication Fundamentals of Wireless Communication. Relate the cellular concepts like frequency reuse, hand off, coverage and capacity. Analyze the mobile radio propagation with large scale and small scale fading. Celect the suitable diversity technique to combat the multipath fading effects. Compare the multiple access techniques and apply to wireless standards. 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 Londrills.				
48. 20CIE03 Artificial Intelligence and Machine Learning Perform clustering operations using appropriate algorithms. Understand the fundamentals of Deep Learning and Neural Networks. Calculate the optimum values for given objective function by LPP. Solve the solution for maximize the profit with minimum cost by Transportation problems. Compute the optimum values for given objective function by LPP and optimal strategy for games. Compute the optimum values for given objective function by LPP and optimal strategy for games. Compute the optimum values for given objective function by LPP and optimal strategy for games. Compute the optimum values for given objective function by LPP and optimal strategy for games. Analyze the optimal strategy for games. Analyze the core concepts of Embedded Systems. Analyze the operating system for embedded Systems and Embedded System Architecture. Design and develop Embedded System hardware and software using Embedded. Analyze the operating system for embedded systems. Analyze the unbedded system services of embedded systems. Communication Embedded Systems and embedded systems and embedded systems and embedded systems. Analyze the mobile radio propagation with large scale and small scale fading. Compare the multiple access techniques and apply to wireless standards. Categorize the waste disposal opti				
Artificial Intelligence and Machine Learning algorithms. 1 20CIE03				Apply regression and classification concepts to real-
48. 20CIE03 Artificial intelligence and Machine Learning and Machine Learning Implement AI concepts using Python. Perform predictive analysis using ML algorithms. Understand the fundamentals of Deep Learning and Neural Networks. Calculate the optimum values for given objective function by LPP. Solve the solution for maximize the profit with minimum cost by Transportation problems. Determine the optimum feasible solution for assignment and travelling salesman problems and computing the optimal solution for Job sequencing models. Compute the optimum values for given objective function by IPP and optimal solution for Job sequencing models. Compute the optimum values for given objective function by IPP and optimal solution for Job sequencing models. Analyze the control path using network scheduling Understand the basics of embedded System Architecture. Design and develop Embedded System hardware and software using Embedded C. Analyze the operating system for embedded System and Embedded System Architecture. Design and develop Embedded System hardware and software using Embedded System development environment and tools used in embedded software development process. Understand the overview of Wireless Communication. Relate the cellular concepts like frequency reuse, hand off; coverage and capacity. Analyze the mobile radio propagation with large scale and small scale fading. Select the suitable diversity technique to combat the multipla fading effects. Compare the multiple access techniques and apply to wireless standards. 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. Understand Organizational Behavioral principles and practices.				world problems.
49. 20CSE05 Optimization Techniques Optimization Techniques Techniq			1	Perform clustering operations using appropriate
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53. 20MEO09 Organizational Behaviour Understand Organizational Behavioral principles and practices. Compare various organizational designs and cultures				and construction Operation Marity is City
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53. 20MEO09 Organizational practices. Behaviour Compare various organizational designs and cultures				
Behaviour Compare various organizational designs and cultures	52	20MEO09		practices.
The state of the s	53.			
				enabling organizational development

	1		Apply motivational theories and leadership styles in
			resolving employee's problems and decision making
			processes.
			Understand the group dynamics, communication
			network, skills needed to resolve organizational conflicts.
1		1	Analyze the behavior, perception and personality of
			individuals and groups in organizations in terms of the
	-		key factors that influence organizational behavior.
			Compute basic mathematical operations on Quantum bits.
54.			Execute Quantum operations of Quantum computing
	20MTO03	Quantum Computing	Built quantum programs
			Develop quantum Logical gates and circuits.
			Develop the quantum algorithm
			Explain the basic concepts of biology and bioinformatics.
		1	Identify various types of biological databases used for the
			retrieval and analysis of the information.
55.	20BTO04	Bioinformatics	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.
			Understand Linux/Unix environment.
			Identify and interpret various system programs.
			Understand and implement shell programming.
56.	20CSC23	Operating Systems Lab	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.
-			Use of various hardware and software components
			related to Internet of Things.
		IoT Development,	Interface I/O devices, sensors to Raspberry Pi/Arduino.
	20CIC05	Applications and	Implement various communication protocols in IoT.
57.		Practice Lab	Monitoring remote system using IoT.
			Hypothesizing Real time IoT based projects.
			Develop real life IoT based projects.
			Identify the different types of connecting Medias and
			equipment's used in the networks Lab.
			Differentiate various network devices like repeater, hub
			and switch.
58.	20CIC06	Computer Networks Lab	
76.			traceroute, nslookup, dig, arp, netstat, nmap.
			Design and demonstrate network topologies using GNS3.
	1		Examine the packet transfer using tcpdump.
	1		Analyze the network performance using Wire shark or
			any tool.
	20CII02		
		Internship-II	
59.			
		(Industrial/	
		Rural Internship)	
	2001007	Theory of Computation	Understand formal language basis
60.	20CIC07	and Compilers	Understand formal language basics and the power of automata to recognize the languages.
		1	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 of intermediate code. Apply Optimization to intermediate code and machine code. Apply Optimization to intermediate code and machine code. Illustrate various object forms, error recovery and tools of a compiler. State the 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 configuration of the concepts and estimate the cost of software using empirical models. Enlist the design principles and construct a product using concepts and estimates software quality of SW. Understand the fundamental design and architectural primitives of Blockchain land consensus protocols. Explore various blockchain palforms and identify the significance of smart contracts. Identify the working of Ethereum and decentralized applications. Implement the blockchain applications with Hyperfedger 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. Understand and summarize different types of sensors/transducers. Illustrate the mechanism to connect the sensors to processing devices. Vulnerability Analysis and Penetration Testing and techniques of vulnerability assessment & neurost to standards for smart sensing. Explain the basic principles and techniques of vulnerability assessment & neurost to standards for smart sensing. Explain the basic principles and techniques of vulnerability assessment & neurost to standards for smart sensing.				
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Experience on various tools & techniques of vulnerability				ethical penetration tests and hide the intrusion.
assessment & penetration testing used in Linux				Experience on various tools & techniques of vulnerability
				assessment & penetration testing used in Linux.

			Identify flaws and vulnerabilities in applications,
		1	websites, networks, systems, protocols and
			configurations using both manual techniques and
		1	assistive tools.
		1	Evaluate the strengths and weaknesses of various
			information technology solutions in terms of data
			security.
			Understand various soft computing concepts and
		1	techniques.
1			Analyze and design various learning models.
			Apply the Neural Network Architecture for various Real
65.	20CSE06	Soft Computing	time applications.
1			Examine and approximate reasoning using fuzzy logic.
		1	Design Genetic algorithms in different applications.
		İ	Develop soft computing techniques to solve different
			applications.
			Interpret and analyze Android platform architecture and
		İ	features to learn best practices in android programming.
1			Design the User Interface for mobile applications.
		1	Apply Intents, Broadcast receivers and Internet services
		Mobile Application	in Android App.
66.	20CSE23	Development	Develop database management system to retrieve and/or
1		20.000	store data for mobile application.
		1	Evaluate and select appropriate android solutions to the
1	l	1	mobile computing platform.
1			Build Flutter applications for complex problems.
			Understand different parallel computing architectures and
1	ì		networks.
			Ability to design parallel algorithms and measure their
		1	performance.
			Understand vector processing, memory bottlenecks, data
67	20CSE37	High Performance	and thread-level parallelism.
67.	2003237	Computing	
			Understand the various programming frameworks like
			MPI, OpenMP and CUDA.
1			Understand cache coherence protocols and read-write
			semantics of parallel programs.
			Gain knowledge of writing efficient parallel programs.
			Demonstrate the understanding of basic concepts of
			remote sensing and interpret energy interactions.
			Choose an appropriate technique for a given scenario by
1	**************************************		appreciating the types of remote sensing.
68.	20ECO01	Demoto Consing and	Distinguish the principle behind the working of
		Remote Sensing and	microwave and LiDAR sensing.
		GIS	Apply Microwave remote sensing techniques.
1			Explain the procedure for encoding data and geospatial
		1	data analysis.
69.		1	Calculate the internal rate of return, annuity and
	20MTO01	Financial Mathematics	amortization.
			Apply the portfolio theory.
			Examine the binomial model of pricing.
			Analyze the stochastic differential equations.
			Solve the BSM partial differential equations.
70.	20EEO02	Energy Management	Know the current Energy Scenario and importance of
70.	2000000	Systems	Energy Conservation.
			Gy 3 shoot ration.

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. Communicate effectively, without barriers and understand aspects of technical communication. Differentiate between general writing and technical writing and write error free sentences using technology 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 demostrate effective technical proposals. Prepare agenda and minutes of a meeting and demostrate effective technical presentation skills. Identify and understand the concepts of hazards, causes and impacts of disaster resilience, risk mitigation, and recovery policies as they arise from practices of disaster risk reduction and management. Develop a critical capacity to evaluate the principles and practices of disaster risk reduction and management. 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 arise from the properties of disaster risk reduction and management. Develop a deep awareness of disaster resilience, risk mitigation as a case study. To relate sustainability concepts and ethical principles towards environment. To understand the different types of environmental pollution problems and their respect sustainable solutions. To ervite a prophy concepts of sustainable development to address sustainability challenges in a global context. To develop sustainable engineering solutions by applying methods and tools to research a specific system design. To apply concepts of sust			1	Ta
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72. 20CEO02 Disaster Risk Reduction and Management Develop a deep awareness of disaster resilience, risk mitigation, and recovery policies as they arise from natural hazards around the globe. Apply knowledge about existing global frameworks and existing agreements and role of community in successful Disaster Risk Reduction. Evaluate DM study including data search, analysis and presentation as a case study. To relate sustainability concepts and ethical principles towards environment. To understand the different types of environmental pollution problems and their respect sustainable 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 a specific system design. To apply concepts of sustainable development to address sustainability challenges in a global context. 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 also become sensitive to their convolutions. They would also become sensitive to their convolitions.				
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72. 20CEO22 Disaster Risk Reduction and Management mitigation, and recovery policies as they arise from natural hazards around the globe. Apply knowledge about existing global frameworks and existing agreements and role of community in successful Disaster Risk Reduction. Evaluate DM study including data search, analysis and presentation as a case study. To relate sustainability concepts and ethical principles towards environment. To understand the different types of environmental pollution problems and their respect sustainable 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 as pecific system design. To apply concepts of sustainable development to address sustainability challenges in a global context. 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 also become sensitive to their committees.				
73. 20CHO04 Environmental and Sustainable Development Environmental and Sustainable Development To develop sustainable engineering solutions by applying methods and tools to research a specific system design. To apply concepts of sustainable development to address sustainability challenges in a global context. Universal Human Values-II Understanding Harmony Apply knowledge about existing global frameworks and existing agreements and role of community in successful Disaster Risk Reduction. Evaluate DM study including data search, analysis and presentation as a case study. To relate sustainability concepts and ethical principles towards environment. To understand the different types of environmental pollution problems and their respect sustainable 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 apply concepts of sustainable development to address sustainability challenges in a global context. 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 also become sensitive to their corporitions.		2005002	Disaster Risk Reduction	mitigation, and recovery policies as they arise from
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activities. To critically evaluate existing and new methods. To develop sustainable engineering solutions by applying methods and tools to research a specific system design. To apply concepts of sustainable development to address sustainability challenges in a global context. 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 commitment.	73.	20CHO04		comparing sustainability implications of anti-
To critically evaluate existing and new methods. To develop sustainable engineering solutions by applying methods and tools to research a specific system design. To apply concepts of sustainable development to address sustainability challenges in a global context. 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 commitments.				activities.
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74. 20EGM03 Universal Human Values-II Understanding Harmony Universal Human Values-II Understanding Harmony 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 commitment.				methods and tools to research a specific system design
74. 20EGM03 Universal Human Values-II Understanding Harmony 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 commitments.				10 apply concepts of sustainable development to address
74. 20EGM03 Universal Human Values-II Understanding Harmony 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 commitment.				Students are expected to become more aware of
74. 20EGM03 Universal Human Values-II Understanding Harmony 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 commitments.				themselves and their surroundings (family society
74. 20EGM03 Values-II Understanding Harmony Values-II Understanding 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 commitments.				nature).
Harmony Harmony Harmony Harmony Keeping human relationships and human nature in mind. They would have better critical ability. They would also become sensitive to their commitment.	74.	20EGM03	Values-II Understanding Harmony	They would become more responsible in life, and in
They would have better critical ability. They would also become sensitive to their commitment				nanding problems with sustainable solutions while
They would also become sensitive to their commitment				They would have better critical ability
towards what they have understood (human values				They would also become sensitive to their access
				towards what they have understood (human volume

			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.
			Identify the problem scope and constraints in the
			problem.
			Prepare software requirements specifications (SRS) for
1			the system according to standards.
7.5	200000	Case Studies using UMI	Apply the design notations of structured approach to
75.	20CSC25	Lab	develop ER and Data Flow Diagrams.
			Apply/Use the design notations of OO approach to
			develop UML diagrams using rational tools.
i l			Implement, analyze and prepare the documentation for
			the proposed system.
			Understand the fundamental design and architectural
			primitives of Blockchain and consensus Protocols.
	l		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
	10 120000000000000000000000000000000000	Blockchain Platforms	
76.	20CIC09	and Applications Lab	Fabric and Composer. Apply blockchain in different application domains such
1			as financial and supply chain sectors.
			Analyze the Implications of blockchain for privacy and
			security.
			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 and Sensing	sensors.
77.	20CIE06	Technologies Lab	Design and implement data processing software to utilise
	1	3	sensor data.
			Develop virtual instruments for specific application using
			LabVIEW software.
			Ease the programming required to make computer
			interact with real world.
			Install and exploit tools for network protection.
			Exploit and analyse vulnerabilities in LAN, wireless
1			devices and identify the same using penetration testing.
78.	2001507	Vulnerability Analysis	Perform vulnerability scanning and penetration testing
/6.	20CIE07	and Penetration Testing	using appropriate tools and techniques.
		Lab	Perform a wireless pen testing, packet analysis and log
			analysis.
			Perform static and dynamic analysis on application.
			Implement McCyllob Pitte medal for Park
			Implement McCulloh-Pitts model for Boolean operations.
			Apply perceptron learning algorithm for a given problem.
1	20CSE15	^	Design and analyze various Neural Networks Architectur
79.			es.
			Apply concepts of fuzzy sets on real-time applications.
			implement Genetic Algorithms with its operators
			Apply soft computing strategies for various real time and
			ications

				· · · · · · · · · · · · · · · · · · ·
				Analyze all the components and their properties of
				Emulators for selecting suitable ciliulator.
)	Apply essential Android programming concepts for	
	- 1			t t in afficient mobile ann
				De la Android applications related to Various layouts.
00	. 1	20000533	Mobile Application	Design Flutter applications with rich user interactive
80).	20CSE32	Development Lab	• 100 000 000 000 000 000 000 000 000 00
				Develop Android applications related to mobile related
				Extend event handling to develop various mobile
				Apply System Commands and Networking commands of
				Linux
	- 1		High Performance	Describe OpenMP constructs and functions.
8	1.	20CSE40	Computing Lab	Design and implement parallel programs using OpenMP.
	-		Company	Apply the APIs in MPI programming.
				Design and implement parallel programs using CUDA.
				Become effective communicators, participate in group discussions with confidence and be able to make
				discussions with confidence and be able to make
				presentations in a professional context.
1				Write resumes, prepare and face interviews confidently. Be assertive and set short term and long term goals, learn
		120248	Employability Skills	to manage time effectively and deal with stress.
82.		20EGC03	Employability Skills	Make the transition smoothly from campus to work, use
				media with etiquette and understand the academic ethics.
				Enrich their vocabulary, frame accurate sentences and
				comprehend passages confidently.
		100 - 100 -		Analyze and design classical encryption techniques and
				block ciphers.
				Analyze and design hash and MAC algorithms, and
				digital signatures.
			Cryptography and	Design network application security schemes like PGP,
	83.	20CSC30	Network Security	S/MIME, IPSec, SSL, TLS, HTTPS, SSH, etc.
				Evaluate the authentication and hash algorithms.
				Create and configure simple firewall architectures.
				Understand digital sign in emails and files.
				Explain the key IIoT concepts and technological
				developments.
				Comprehend the value created by collecting,
				communicating, coordinating, and leveraging the data
	0.4	20CIE08	IoT Automation and	from connected devices.
	84.		Security	Analyze the Security requirements in IoT.
			~	Illustrate authentication credentials and access control.
				Describe various types of Trust models.
-				Identify and perform Cloud services for IoT Automation.
				Apply up to date social engineering techniques and
		1		ethical consideration.
			Extract Intelligence from publicly available sources to	
		20CIE09		support intelligent needs and to discover vulnerabilities in
	85.		Social Engineering	IT Systems.
				Explore different types of social engineering attack.
				Identity the attacks and victims.
				Acquire knowledge on tactics and strategies on how to
				protect network against attack.

			Understand the core functionality and utility of
			Blockchain and Cryptocurrency technologies.
			Familiarize with working of different cryptocurrencies.
			Explain the positive and negative implications of
96		220	cryptocurrencies.
86.	20CIE10	Crypto Currencies	Differentiate the modern currencies and its market usage.
	,		Understand the Regulations of different cryptocurrencies.
			Understand the basic concepts of Natural language
			processing pipeline and applications of NLP.
			Illustrate various text representation techniques in NLP.
			Analyse text classification techniques and deep learning
	ander 11	Natural Language	basics to process natural language text. Explore text summarization methods and example
87.	20CSE11	Processing	
			systems. Demonstrate levels of NLP for several case studies.
			Apply NLP Pipe lines to solve real world applications.
		_	Apply NLF Fipe lines to solve real world approximents
			Demonstrate knowledge of Big Data, Data Analytics,
			challenges and their solutions in Big Data.
			Discuss about Hadoop Framework and eco systems.
			Understand and work on NoSQL environment and
	-		MongoDB.
			Explain and Analyse the Big Data using Map-reduce
			programming in Both Hadoop and Spark framework.
00	20CSE22	Big Data Analytics	Demonstrate spark programming with Python/R
88.	20CSE22	Dig Data Amarytics	programming languages.
			Explain and Analyse the data Analytics algorithms in
			Spark.
			Set up a safe virtual environment to analyze malware,
			quickly extract network signatures and host-based indicators.
			Use key analysis tools like IDA Pro, OllyDbg, and
			WinDbg.
			Overcome malware tricks like obfuscation, anti-
			disassembly, anti-debugging, and anti-virtual machine
89.	20CIE11	Malware Analysis	techniques.
			Use knowledge of Windows internals for malware
			analysis.
			Analyse malware behaviour, including launching,
			encoding, and network signatures.
1	1		Design and deploy machine learning based malware
			detectors.
			Understand the principles and strategies of infrastructure
			for building secure and reliable systems.
			Identify various tools and technologies to manage
			infrastructure and other resources.
			Create Git-based platforms for collaborative development
	20CIE12	Building Secure and	and maintenance of Software Products
90.		Reliable Systems	Perform various tests including infrastructure,
			production, fail-over, capacity, security, and compliance
			tests.
			Configure infrastructure resources using configuration
			management tools.
01	2000000	Enterprise Application	Design systems to provide concurrency.
91.	20CSE08	Emerprise Application	Understand the database connectivity and application

		Development	servers.
		-	Explore the type of forms with validations using ReactJS.
			Utilize Express framework to develop responsive web
			applications.
			Demonstrate the architecture and file system of NodeJs.
			Identify the significance of component
			intercommunication with Angular2. Adapt MEAN or MERN stack to implement a real-time
			web application.
			Understand various learning models.
			Design and develop various Neural Network
			Architectures.
			Understand approximate reasoning using Convolution
			Neural Networks.
92.	20CSE21	Deep Learning	Analyze and design Deep learning algorithms in different
92.	200521	2007	applications.
			Ability to apply CNN and RNN techniques to solve
			different applications.
	_		Evaluate the Performance of different models of Deep
			learning networks.
			Understand the need of cloud technology and
		-	terminology.
			Identify and understand the cloud infrastructure.
93.	20CSE34	Cloud Computing	Write scripts for the automation of infrastructure and software deployment.
			Design solutions for the automation and migration of
			manual data centers.
			Develop scripts for the automation of cloud services.
			Demonstrate the process of beginning of science and
			civilization, knowledge acquisition and philosophical
		7	approach of science and its advancements in the Stone
			Ages and Antiquity period.
			Illustrate the advancements in science and technology in
			the medieval period across Asia and Arab countries and
			decline and revival of science in Europe.
			Explain the scientific approach and its advances of the
	l .		Europeans and how the role of engineer during the
		History CG :	industrial revolution and the major advancements.
94.	20PYO01	History of Science and	Make use of the advancements in the field of science and
		Technology	technology by adopting new philosophies of 19th and
			first half of 20th century in finding ethical solutions to
			the societal problems.
			Interpret the changes in specializations of science and the
			technology and build the relation between information
			and society from second half of 20th century onwards. Define research problem.
			Review and assess the quality of the
9			Review and assess the quality of literature from various sources.
95.	20MEO03	Research	A 920-34034 (964-314)
		Methodologies	Understand and develp various sresearch designs.
		Wethodologies	Analyze problem by sttistical techniques: ANOVA, F-test, Chi-square.
			Improve the style and ormat of writing a report for
			technical paper/Journal report.
96.	20ME004	Entropyona	Understand the concept and essence of entrepreneurship.
90.	20MEO04	Entrepreneurship	Identify business opportunities and nature of enterprise.
			y susmoss opportunities and nature of enterprise.

			Analyze the feasibility of new business plan.
			Apply project management techniques like PERT and
			CPM for effective planning and execution of projects. Use behavioral, leadership and time management aspects
			in entrepreneurial journey.
	-		Understand the features of various automatic and process
			control systems.
			Define and analyze various measuring parameters in the
			industry.
97.	20ECO05	Systems Automation and Control	Compare performance of various controllers (P, PD, PI,
\$965 3 65ft	100000000000000000000000000000000000000	and Control	and PID).
			Illustrate the role of digital computers in automation.
			Develop various robot structures for different
			applications.
			Know the current energy scenario and various energy sources.
			Understand the concepts of energy auditing.
			Evaluate the performance of existing engineering
98.	20EEO03	Energy Auditing	systems.
70.			Explore the methods of improving energy efficiency in
			different engineering systems.
			Design different energy efficient appliances.
			Understand the making of the Indian Constitution and its
			features.
			Identify the difference among Right To equality, Right
			To freedom and Right to Liberty.
99.	20EGM01	Indian Constitution and Fundamental Principles	
99.	20EGM01		differentiate the powers between Union and States.
			Distinguish between the functioning of Lok Sabha and Rajya Sabha while appreciating the importance of
			Judiciary.
			Differentiate between the functions underlying
	-		Municipalities, Panchayats and Co-operative Societies
	1		Understand philosophy of Indian culture.
		Indian Tourist	Distinguish the Indian languages and literature
100.	20EGM02	Indian Traditional Knowledge	Learn the philosophy of ancient, medieval and modern
		Kilowieuge	india.
			Acquire the information about the fine arts in India.
			Know the contribution of scientists of different eras.
			Identify basic security attacks and services.
101.	2000001	Cryptography and	Design symmetric and asymmetric key algorithms for cryptography.
101.	20CSC31	Network Security Lab	Create and use of Authoritical Create and use of Authoritical Create
			Create and use of Authentication functions.
			Analyze and design network security threat.
102.			Analyze and design network security protocols. Create virtual environment to analyze malware.
			Point out network signatures and beautiful analyze malware.
	20CIE13	Malware Analysis Lab	Point out network signatures and host-based indicators for malware recognition on infected machines.
			Use key analysis tools to detect and classify malware.
			Charlia Illalware fricks like at c
			disassembly, anti-debugging, and anti-virtual machine
		D 1111 =	Inspect malware functionalities and commands.
		Building Secure and	and commands.

Professor and the Science & Engineering Chaitanya Bharathi Institute of Technology (A) Gandipet, Hyderabad-500 075.(T.S.)

103.	20CIE14	Reliable Systems Lab	
			- 11 11 11 11 11 11
			Prepare database connections with application servers.
		1	Design user interfaces using ReactJS. Construct strong expertise on Express framework to
		Enterprise Application	develop responsive web applications.
104.	20CSE17	Development Lab	Create server side applications using Node.js
	į.		Develop SPA using Angular 2.
			Invent next culture-shifting web applications.
			Implement various learning models.
			Design and develop various Neural Network
			Architectures.
		1	Analyze various Optimization and Regularizations
4		- 1	techniques of deep learning.
105.	20CSE30	Deep Learning Lab	Analyze various pretrained models using Convolution
105.	2003230	1	Neural Networks.
			Ability to apply RNN techniques to solve different applications.
			Evaluate the Performance of different models of Deep
			learning networks.
			Configure various virtualization tools such as
		1	VirtualBox/VMware Workstation.
			Manage resources in virtual machines.
			Design, implement and Deploy applications in PaaS
106.	20CSE38	Cloud Computing Lab	environment.
			Demonstrate Unix and Hadoop commands in VM.
			Explore the features of Hadoop.
			Install Hadoop single node cluster and run simple
			applications like WordCount.
			Study and review research papers of new field/areas and summarize them.
			Identify promising new directions of various cutting edge
107.	20CIC10	T 1 : 10 :	technologies in Computer Science and Engineering. Impart skills to prepare detailed report describing the
107.	2001010	Technical Seminar	selected topic/area.
		1	Acquire skills to write technical papers/articles for
		1	publication.
			Effectively communicate by making an oral presentation
			before the evaluating committee.
			Review the literature related to the problem area /
			selected topic.
			Undertake problem identification, formulation and
			solution.
108.	20CIC11	D	Prepare synopsis of the selected topic.
.00.	2001011	Project Part - 1	Gather the required data and Set up the environment for
			the implementation.
			Conduct preliminary analysis/modelling/simulation
		-	experiment.
			Communicate the work effectively in both oral and
	20CII03	Internship-III	written forms.
	_ ,	meetisiip-iii	

Integrate the aspects of human cognitive proc	
Integrate the aspects of human cognitive proc	
Integrate the agreets of human cognitive proc	
system design.	esses in the
Comprehend underlying cognitive process that abstractions of a cognitive cycle.	nt has many
Detect any failure of system component	s and re-
110. 20CIE15 Cognitive IoT configure itself which provide a graceful of through self-healing.	degradation
Accomplish knowledge about the application architecture, resources, system state and behave	
Apply advanced techniques in cognitive IoT.	
Analyze security issues in IoT applications.	
Understand CIA Security triad in blockchain.	
Understand identity, authentication and mechanisms and their challenges.	l naming
Blockchain Security Identify different types of DDoS attacks.	
and Privacy Apply blockchain based solutions for in	nformation
security.	
Understand the common and specific risks in technology.	
Understand the key essentials of policy making	and areas
of policy governance and nation-led blockcha worldwide.	in policies
Understand the legal issues and the need for r	
112. 20CIE17 Blockchain Policy: in blockchain applications.	egulations
Legal, Economic and Comprehend regulation mechanisms for digital	accete and
Social Impact blockchain applications.	
Analyze the primary and secondary markets assets.	for digital
Understand the impact of blockchain adoption	on on the
society in different sectors.	
Identify various FOSS tools, platforms,	licensing
procedures and development models, ethics.	
Describe various FOSS projects, development	nt models
and project management.	
Free and Open Source Adapt to the usage of FOSS tools and technolog Technologies Distinguish between Proprietary and Open Source	ies.
Technologies Distinguish between Proprietary and Open Sou development methods.	irce tools,
Practice Open Source principles, ethics, and m	
to evaluate various Open Source projects lik	odels and
Apache, GIT, etc.	te Linux,
Explain how the humans interact with computers	,
Understand the design and implementation	of 41.
technologies for AR and VR systems	
20CSE35 Augmented Reality and Apply technical and creative approaches	to make
successful applications and experiences	паке
Design audio and video interaction paradiams	
Onderstand AR and VR best practices	
Apply VR/MR/AR in various fields in industric	
20EGM04 Gender Sensitization Understand the difference between "Sex" and "	"Cand "
and Sex and	Gender"

			and be able to explain socially constructed theories of
			identity.
			Recognize shifting definitions of "Man" and "Women" in
			relation to evolving notions of "Masculinity" and
			"Femininity".
115			Appreciate women's contributions to society historically,
115.			culturally and politically.
			Analyze the contemporary system of privilege and
		- 1 1	oppressions, with special attention to the ways gender
			intersects with race, class, sexuality, ethnicity, ability,
			religion, and nationality.
	_		Demonstrate an understanding of personal life, the
			workplace, the community and active civic engagement
			through classroom learning.
			Identify the natural resources and realise the importance
			of water, food, forest, mineral, energy, land resources and
-			affects of over utilization.
	20CEM01		Understand the concept of ecosystems and realise the
116.			importance of interlinking of food chains.
		Environmental Science	Contribute for the conservation of bio-diversity.
		Environmental serence	Suggest suitable remedial measure for the problems of
			environmental pollution and contribute for the framing of
			legislation for protection of environment.
			Follow the environmental ethics and contribute to the
			mitigation and management of environmental disasters.
			Demonstrate a sound technical knowledge of their
			selected topic.
			Design engineering solutions to complex problems
			utilizing a systematic approach.
			Conduct investigations by using research-based
			knowledge and methods to provide valid conclusions.
117.	20CIC12	Project Part – 2	Create/select/use modern tools for the modelling,
117.	2001012	1 roject ruit 2	prediction and understanding the limitation of complex
			engineering solutions.
			Communicate with engineers and the community at large
			in written and oral forms.
			Demonstrate the knowledge, skills and attitudes of a
	L		professional engineer.

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