Department of Computer Science and Engineering
Program – B. Tech
(PEO/PO/PSO/CO)

Program Educational Objectives (PEO)

The graduates of Computer Science and Engineering will

- **PEO1- Technical Excellence:** Graduates will have the ability to apply their knowledge of mathematics, science, and engineering to identify, analyze, design, and develop efficient and effective solutions to real-world problems in the field of computer science and engineering.
- **PEO2- Professionalism:** Graduates will have a strong foundation in ethical and professional principles, and will demonstrate leadership, communication, teamwork, and project management skills to work collaboratively and contribute to the success of their organizations.
- **PE03- Lifelong Learning:** Graduates will be equipped with the necessary skills and attitude to engage in lifelong learning and professional development, and be able to adapt to rapidly changing technology and industry trends.
- **PEO4-Entrepreneurship:** Graduates will have an entrepreneurial mindset and the ability to identify opportunities, innovate, and create value by developing and commercializing new products, services, and technologies.
- **PEO5- Social Responsibility:** Graduates will recognize the impact of their work on society, and will be committed to using their technical knowledge and skills to contribute to the betterment of society and address global challenges.

Programme Outcomes (PO)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **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 the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research

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methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

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

6. 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.

7. 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.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with 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.

11. 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.

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

Programme Specific Outcomes (PSOs)

Students of Computer Science and Engineering Program will demonstrate:

- **PSO1** - Express understanding of the values and functioning of the hardware and software facets of computer systems.
- **PSO2-** Utilize skilled engineering and programming procedures, tactics and approaches for the advancement, strategy and maintenance of software.
- **PSO3**- Offer efficient and inexpensive genuine time resolutions using acquired experience in various fields of Computer Science and Engineering.

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Course Outcomes (Cos)

COURSE OUTCOMES 2018 BATCH ONWADS				
Program	**Course Code**	**Course**	**CO No.**	Course Outcomes After completing the course, the student will be able to
B.Tech (Computer Science and Engineering)	BCHM0-101	Chemistry-I	BCHM0-101.CO1	analyze microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.
			BCHM0-101.CO2	rationalize bulk properties and processes using thermodynamic considerations.
			BCHM0-101.CO3	distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques
			BCHM0-101.CO4	rationalize periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity.
			BCHM0-101.CO5	list major chemical reactions that are used in the synthesis of molecules.
B.Tech (Computer Science and Engineering)	BMAT0-101	Mathematics-I	BMAT0-101.CO1	apply differential and integral calculus to notions of curvature and to improper integrals. Apart from some other applications they will have a basic understanding of Beta and Gamma functions.
			BMAT0-101.CO2	the fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems.
			BMAT0-101.CO3	the tool of power series and Fourier series for learning advanced Engineering Mathematics.
			BMAT0-101.CO4	deal with functions of several variables that are essential in most branches of engineering.
			BMAT0-101.CO5	get essential tool of matrices and linear algebra in a comprehensive manner.
B.Tech (Computer Science and Engineering)	BHUM0-101	English	BHUM0-101.CO1	acquire basic proficiency in English including reading and listeningcomprehension, writing and speaking skills.

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B.Tech (Computer Science and Engineering)	BCSE0-101	Programming for Problem Solving	BCSE0-101.CO1	formulate simple algorithms for arithmetic and logical problems
			BCSE0-101.CO2	translate the algorithms to programs (in C language).
			BCSE0-101.CO3	test and execute the programs and correct syntax and logical errors.
			BCSE0-101.CO4	implement conditional branching, iteration and recursion.
			BCSE0-101.CO5	decompose a problem into functions and synthesize a complete program using divide and conquer approach.
			BCSE0-101.CO6	use arrays, pointers and structures to formulate algorithms and programs.
			BCSE0-101.CO7	apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
			BCSE0-101.CO8	apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.
B.Tech (Computer Science and Engineering)	BCHM0-102	Chemistry-I Lab.	BCHM0-102.CO1	estimate rate constants of reactions from concentration of reactants/products as a function of time
			BCHM0-102.CO2	measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc.
			BCHM0-102.CO3	synthesize a small drug molecule and analyze a salt sample
B.Tech (Computer Science and Engineering)	BHUM0-102	English Lab.	BHUM0-102.CO1	cover comprehensive exposition to lexical derivatives and word-formation
			BHUM0-102.CO2	understand the mechanics of writing: semantics
			BHUM0-102.CO3	identify errors and non-native flaws in English sentence framework

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			BHUM0-102.CO4	learn nature and style of writing with varied writing forms
B.Tech (Computer Science and Engineering)	BCSE0-102	Programming for Problem Solving Lab.	BCSE0-102.CO1	understand C programming develoment environment, compiling, debugging, linking and executing a program using the development environment.
			BCSE0-102.CO2	analyzing the complexity of problems, modularize th problems into small modules and then convert into programs
			BCSE0-102.CO3	understand and apply the inbuilt functions and customized functions for solving the problems.
			BCSE0-102.CO4	understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems
B.Tech (Computer Science and Engineering)	BPHY0-101	Physics	BPHY0-101.CO1	understand the basics of Electromagnetism,Electrostatics in vaccum and in linear dielectric medium and electromagnetic waves.
			BPHY0-101.CO2	understand the basics of Faraday laws and evaluate the Maxwell's equations in different medium.
			BPHY0-101.CO3	understand the phenomenon of Magnetostatics and magnestatic in linear magnetic medium.
			BPHY0-101.CO4	understand the Relation between electric and magnetic field of EM wave
B.Tech (Computer Science and Engineering)	BMAT0-201	Mathematics-II	BMAT0-201.CO1	understand the mathematical tools needed in evaluating multiple integrals and their usage.
			BMAT0-201.CO2	understand the effective mathematical tools for the solutions of differential equations that model physical processes.
			BMAT0-201.CO3	understand the tools of differentiation and integration of functions of a complex variable that are used in various techniques dealing engineering problems.
B.Tech (Computer Science and Engineering)	BELE0-101	Basics Electrical Engineering	BELE0-101.CO1	understand and analyze basic DC and AC circuits
			BELE0-101.CO2	study the use and working principle of single phase transformers.

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			BELE0-101.CO3	introduce to the components of low voltage electrical installations.
B.Tech (Computer Science and Engineering)	BPHY0-102	Physics Lab.	BPHY0-102.CO1	understand the working of CRO
			BPHY0-102.CO2	understand the concept of oscillation in LCR Circuits
			BPHY0-102.CO3	understand the properties of Magnetic material
			BPHY0-102.CO4	knowledge about the electric circuit (LC and RC circuits)
B.Tech (Computer Science and Engineering)	BELE0-102	Basics Electrical Engineering Lab.	BELE0-102.CO1	get an exposure to common electrical components and their ratings
			BELE0-102.CO2	make electrical connections by wires of appropriate ratings
			BELE0-102.CO3	understand the usage of common electrical measuring instruments.
			BELE0-102.CO4	understand the basic characteristics of transformers and electrical induction motors.
B.Tech (Computer Science and Engineering)	BMEE0-102	Engineering Graphics & Design Lab.	BMEE0-102.CO1	get exposure to computer-aided geometric design
			BMEE0-102.CO2	get exposure to creating working drawings
			BMEE0-102.CO3	get exposure to engineering communication
B.Tech (Computer Science and	BCSES1-302	DATA STRUCTURE &	BCSES1-302.CO1	analyze the algorithms to determine the timeand computation complexity and justify the correctness for a given algorithm

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Engineering)		ALGORITHMS	BCSES1-302.CO2	implement the Search problem (Linear Search and Binary Search) for a given problem.
			BCSES1-302.CO3	implement Stacks, Queues and linked list for a given problem and analyze the same to determine the time and computation complexity
			BCSES1-302.CO4	write an algorithm Selection Sort, Bubble Sort, Insertion Sort,Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Spaceand Time complexity.
			BCSES1-302.CO5	implement Graph search and traversal algorithms and determinethe time and computation complexity.
B.Tech (Computer Science and Engineering)	BCSES1-303	DIGITAL ELECTRONICS	BCSES1-303.CO1	understand working of logic families and logic gates.
			BCSES1-303.CO2	design and implement Combinational and Sequential logiccircuits
			BCSES1-303.CO3	understand the process of Analog to Digital conversion and Digital to Analog conversion
			BCSES1-303.CO4	use PLDs to implement the given logical problem.
B.Tech (Computer Science and Engineering)	BCSES1-304	DATA STRUCTURE & ALGORITHMS LABORATORY	BCSES1-304.CO1	introduce the basic concepts of Data structure, basic data types, searching and sorting based on array data types.
			BCSES1-304.CO2	introduce the structured data types like Stacks and Queue and its basic operation's implementation

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			BCSES1-304.CO3	introduces dynamic implementation of linked list
			BCSES1-304.CO4	introduce the concepts of Tree and graph and implementation of traversal algorithms
B.Tech (Computer Science and Engineering)	BCSES1-305	DIGITAL ELECTRONICS LABORATORY	BCSES1-305.CO1	familiarization with Digital Trainer Kit and associated equipment
			BCSES1-305.CO2	study and design of TTL gates
			BCSES1-305.CO3	learn the formal procedures for the analysis and design of combinational circuits.
			BCSES1-305.CO4	learn the formal procedures for the analysis and design of sequential circuits
B.Tech (Computer Science and Engineering)	BITES1-306	IT Workshop (SciLab / MATLAB) Laboratory	BITES1-306.CO1	understand the need and main features of the MATLAB/SCILAB programdevelopment environment to enable their usage in the higher learning.
			BITES1-306.CO2	implement simple mathemacal funcons/equaons in numerical compung environment such as MATLAB/SCILAB.
			BITES1-306.CO3	interpret and visualize simple mathemacal funcons and operaonsthereon using plots/display

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B.Tech (Computer Science and Engineering)	BMATH1-401	DISCRETE MATHEMATICS	BMATH1-401.CO1	get knowledge of logic sentence express it in terms of predicates, quantifiers, and logicalconnectives
			BMATH1-401.CO2	derive the solution using deductive logic and prove the solutionbased on logical inference
			BMATH1-401.CO3	classify its algebraic structure mathematical problem
			BMATH1-401.CO4	evaluate Boolean functions and simplify expressions using the properties of BooleanAlgebra
			BMATH1-401.CO5	develop the given problem as graph networks and solve with techniques of graphtheory.
B.Tech (Computer Science and Engineering)	BCSES1-401	COMPUTER ORGANIZATION & ARCHITECTURE	BCSES1-401.CO1	draw the functional block diagram of a single bus architecture of a computer anddescribe the function of the instruction execution cycle, RTL interpretation ofinstructions, addressing modes, instruction set
			BCSES1-401.CO2	write assembly language program for specified microprocessor for computing16 bit multiplication, division and I/O device interface (ADC, Control circuit, serialport communication)
			BCSES1-401.CO3	write a flowchart for Concurrent access to memory and cache coherency in ParallelProcessors and describe the process.
			BCSES1-401.CO4	get knowledge of CPU organization and instruction, design a memory module and analyze its operation by interfacing with the CPU.
			BCSES1-401.CO5	get knowledge of CPU organization, assess its performance, and apply design techniques to enhance performance using pipelining, parallelism and RISC methodology
B.Tech (Computer Science	BCSES1-402	OPERATING SYSTEMS	BCSES1-402.CO1	create processes and threads.

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and Engineering)			BCSES1-402.CO2	develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time
			BCSES1-402.CO3	get specification of memory organization develop the techniques foroptimally allocating memory to processes by increasing memory utilization andfor improving the access time.
			BCSES1-403.CO4	design and implement file management system and For a given I/O devices and OS (specify) develop the I/O management functions in OS as part of a uniform device abstraction by performing operations for synchronizationbetween CPU and I/O controllers.
B.Tech (Computer Science and Engineering)	BCSES1-403	OBJECT ORIENTED PROGRAMMING	BCSES1-403.CO1	introduce the basic concepts of object oriented programming language and its representation
			BCSES1-403.CO2	allocate dynamic memory, access private members of class and the behavior of inheritance and its implementation
			BCSES1-403.CO3	introduce polymorphism, interface design and overloading of operator
			BCSES1-403.CO4	handle backup system using file, general purpose template and handling of raised exception during programming
B.Tech (Computer Science and Engineering)	BCSES1-404	Operating Systems Laboratory	BCSES1-404.CO1	perform installation of various operang systems.
			BCSES1-404.CO2	understand virtualizaon and installaon of Operang System in virtual machine.
			BCSES1-404.CO3	implement commands for files and directories in LINUX O.S.
			BCSES1-404.CO4	apply process management through commands in LINUX.
			BITES1-405.CO5	acquire knowledge of shell scripts and their execuon, shell variables,statements and creaon of shell programs for automaon of tasks.

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B.Tech (Computer Science and Engineering)	BITES1-405	Object Oriented Programming Laboratory	BITES1-405.CO1	create simple programs using classes and objects in C++.
			BITES1-405.CO2	implement Object Oriented Programming Concepts in C++.
			BITES1-405.CO3	develop applicaons using stream I/O and file I/O.
			BITES1-405.CO4	implement Object Oriented Programs using templates and exceponalhandling concepts.
B.Tech (Computer Science and Engineering)	BCSES1-501	COMPILER DESIGN	BCSES1-501.CO1	develop the lexical analyser for a given grammar specification,
			BCSES1-501.CO2	design top-down and bottom-up parsers for a given parser specification
			BCSES1-501.CO3	use syntax directed translation schemes to develop intermediate code.
			BCSES1-502.CO4	learn algorithms to generate code for a target machine
B.Tech (Computer Science and Engineering)	BCSES1-502	DATABASE MANAGEMENT SYSTEM	BCSES1-502.CO1	learn different DBMS languages and data models
			BCSES1-502.CO2	construct the SQL queries for Open source and Commercial DBMS -MYSQL, ORACLE, and DB2 For a given specification
			BCSES1-502.CO3	determine the transaction atomicity, consistency, isolation, and durability for a given transaction-processing system
			BCSES1-503.CO4	implement database security.
B.Tech (Computer Science and Engineering)	BCSES1-504	DESIGN &ANALYSIS OF ALGORITHMS	BCSES1-504.CO1	analyze worst-case running times of algorithms based on asymptotic analysis for a given algorithms and justify the correctness of algorithms.
			BCSES1-504.CO2	describe the greedy paradigm and explain when an algorithmic design situation calls for it

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			BCSES1-504.CO3	describe the different graph and tree traversal algorithms.
			BCSES1-504.CO4	describe the computability of problem using Cook's theorem.
B.Tech (Computer Science and Engineering)	BCSES1-505	DATABASE MANAGEMENT SYSTEM LABORATORY	BCSES1-505.CO1	To understand basic DDL, DML, DCL commands
			BCSES1-505.CO2	understand the SQL queries using SQL operators
			BCSES1-505.CO3	understand the concept of relational algebra, date and group functions
			BCSES1-505.CO4	implement checkpoints.
B.Tech (Computer Science and Engineering)	BCSES1-506	DESIGN &ANALYSIS OF ALGORITHMS LABORATORY	BCSES1-506.CO1	perform different operations on integers
			BCSES1-506.CO2	sort number of elements of an array using different sorting techniques
			BCSES1-506.CO3	implement dynamic programming for various problems

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			BCSES1-506.CO4	compute convex hull.
B.Tech (Computer Science and Engineering)	BCSED1-514	JAVA PROGRAMMING	BCSED1-514.CO1	learn the basics of Java and to understand the implementation of Classes and Inheritance with respect to Java.
			BCSED1-514.CO2	describe the concept of handling of exceptions and multithreading
			BCSED1-514.CO3	understand how to implement I/O, Applets and Graphics in Java
			BCSED1-514.CO4	comprehend the advanced topics of Java Programming
B.Tech (Computer Science and Engineering)	BCSES1-601	SOFTWARE ENGINEERING	BCSES1-601.CO1	study how software engineering principles evolve and to analyze the various software models that can be followed to develop software.
			BCSES1-601.CO2	understand the software analysis and design step of software development
			BCSES1-601.CO3	study coding, testing and reliability of a software.
			BCSES1-602.CO4	highlight the various management activities and related terms of a software
B.Tech (Computer Science and Engineering)	BCSES1-602	COMPUTER NETWORKS	BCSES1-602.CO1	explain the functions of the different layer of the OSI Protocol.
			BCSES1-602.CO2	draw the functional block diagram of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) describe the function of each block.
			BCSES1-602.CO3	developed the network programming for a given problem related TCP/IP protocol

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			BCSES1-602.CO4	configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW,HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.
B.Tech (Computer Science and Engineering)	BCSES1-603	COMPUTER NETWORKS LABORATORY	BCSES1-603.CO1	become familiarize with different networking components.
			BCSES1-603.CO2	learn the concept of data transmission using different cables.
			BCSES1-603.CO3	learn different topologies and implement file sharing.
			BCSES1-603.CO4	implement different networks.
B.Tech (Computer Science and Engineering)	BCSED1-613	DISTRIBUTED SYSTEMS	BCSED1-613.CO1	learn architecture of DDBS.
			BCSED1-613.CO2	learn different design strategies and query processing.
			BCSED1-613.CO3	optimize Distributed queries.
			BCSED1-613.CO4	learn reliability issues.
B.Tech (Computer Science and Engineering)	BCSES1-604	Project-I	BCSES1-604.CO1	demonstrate a depth of knowledge of Computer Science and Engineering.
			BCSES1-604.CO2	demonstrate knowledge of contemporary issues in their chosen field of research.
			BCSES1-604.CO3	design engineering solutions to complex problems utilizing a systems approach.

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			BCSES1-604.CO4	communicate with engineers and the community at large in written an oral forms.
B.Tech (Computer Science and Engineering)	BCSED1-711	DISTRIBUTED OPERATING SYSTEMS	BCSED1-711.CO1	learn architecture of distributed operating systems.
			BCSED1-711.CO2	learn resource management.
			BCSED1-711.CO3	learn distributed OS implementation.
			BCSED1-711.CO4	learn multiprocessor system.
B.Tech (Computer Science and Engineering)	BCSED1-724	ARTIFICIAL INTELLIGENCE	BCSED1-724.CO1	understand the concept of Artificial intelligence, problem solving and various types of search strategies.
			BCSED1-724.CO2	understand the concept of Knowledge base, knowledge representation, AI languages & tools and various planning techniques.
			BCSED1-724.CO3	identify uncertainty and understand fuzzy logic concept to handle uncertainty.
			BCSED1-724.CO4	understand the COURSE of AI agents and various COURSE methods it also includes neural network and includes the communication of AI agents and natural language processing.
B.Tech (Computer Science and Engineering)	BELE0-F94	RENEWABLE ENERGY SOURCES	BELE0-F94.CO1	obtain knowledge about renewable energy sources and solar energy and their utilization.
			BELE0-F94.CO2	introduce to wind energy conversion and bio-mass energy conversion systems
			BELE0-F94.CO3	introduce to geothermal energy and energy from ocean. To make them aware about hydrogen energy sources.
B.Tech (Computer Science and Engineering)	BCSES1-701	Project-II	BCSES1-701.CO1	demonstrate a depth of knowledge of Computer Science and Engineering.
			BCSES1-701.CO2	demonstrate knowledge of contemporary issues in their chosen field of research.

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			BCSES1-701.CO3	design engineering solutions to complex problems utilizing a systems approach.
			BCSES1-701.CO4	communicate with engineers and the community at large in written an oral forms.
B.Tech (Computer Science and Engineering)	BCSES1-702	Training-III	BCSES1-702.CO1	understand the usage of various computer science and engineering software's and modern engineering tools.
			BCSES1-702.CO2	understand the usage of various mechanical engineering software's and modern engineering tools.
			BCSES1-702.CO3	learn to document training report/project work.
B.Tech (Computer Science and Engineering)	BCSED1-814	SOFTWARE PROJECT MANAGEMENT	BCSED1-814.CO1	apply the basics of Software Project Management in order to manage and deliver qualified product and plan the activities within time schedules with CPM and PERT Analysis.
			BCSED1-814.CO2	manage the quality of product and managing the risk involved
			BCSED1-814.CO3	manage team and measuring and tracking the planning
			BCSED1-814.CO4	learn Configuration management and project monitoring and control
B.Tech (Computer Science and Engineering)	BMNCC0-006	ESSENCE OF INDIAN KNOWLEDGE TRADITION	BMNCC0-006.CO1	understand philosophy of Indian culture
			BMNCC0-006.CO2	distinguish the Indian languages and literature among difference traditions
			BMNCC0-006.CO3	learn the philosophy of ancient, medieval and modern India

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			BMNCC0-006.CO4	acquire the information about the fine arts in India.
			BMNCC0-006.CO5	know the contribution of scientists of different eras.
			BMNCC0-006.CO6	know the essence of Yogic Science for Inclusiveness of society.
B.Tech (Computer Science and Engineering)	BEEE0-F94	NON CONVENTIONAL ENERGY RESOURCES	BEEE0-F94.CO1	understand conventional and nonconventional sources of energy
			BEEE0-F94.CO2	evaluate different sources of energy.
			BEEE0-F94.CO3	persuade community to use renewable energy sources.
B.Tech (Computer Science and Engineering)	BCSES1-801	Project-III	BCSES1-801.CO1	demonstrate a depth of knowledge of Computer Science and Engineering.
			BCSES1-801.CO2	demonstrate knowledge of contemporary issues in their chosen field of research.
			BCSES1-801.CO3	design engineering solutions to complex problems utilizing a systems approach.
			BCSES1-801.CO4	communicate with engineers and the community at large in written an oral forms.

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