



Department of Electronics and Computer Engineering

Course Outcomes (COs) AY 2023-24

Semester	Name of subject	CO NO.	Course Outcomes (COs)
III	Engineering Mathematics – III (BTES301)	1	Students will be able to apply the concepts and properties of Laplace Transformation.
		2	Students will be able to apply the concepts of inverse Laplace Transform with its property to solve linear differential equation with given initial conditions.
		3	Students will be able to find Fourier Transform of given function by using properties and identities.
		4	Students will be able to solve various Partial Differential equations such as one and two dimensional heat flow equations with appropriate way.
		5	Students will be able to construct required analytic function and evaluate contour integral using residue and Cauchy's Integral Theorem.
	Electronics Devices and Circuits (BTECPC302)	1	Students will be able to discuss operation, biasing and applications of JFET & MOSFET.
		2	Students will be able to examine linear applications of operational amplifier.
		3	Students will be able to illustrate transistorized negative feedback amplifiers and oscillator circuits.
		4	Students will be able to analyze transistorized and IC based voltage regulator circuits.
		5	Students will be able to select appropriate transducer for developing electronics applications.
	Programming Data Structure & Algorithm Using C (BTECPC303)	1	Students will be able to describe various data structure and perform various operations on linked list data structure.
		2	Students will be able to describe working of stack data structure and perform various operations of stack data structure.
		3	Students will be able to describe working of queue data structure and perform various operations of queue data structure.
4		Students will be able to describe non-linear data structure like trees and graph and perform various operations of same.	

**CSMSS**

Chhatrapati Shahu Maharaj Shikshan Sanstha's

CHH. SHAHU COLLEGE OF ENGINEERING

Kanchanwadi, Paithan Road, Chh. Sambhajinagar, 431 011

Ph. No. : (0240) 2646373, 9922668199, 2646350 Fax: (0240) 2646222

Website: www.csmssengg.org

Approved by AICTE New Delhi, DTE (Govt. of Maharashtra) and affiliated to Dr. BATU, Lonere (Raigad). **DTE Code: 2533**

	5	Students will be able to apply different searching and sorting algorithms and calculate time and space complexity of given algorithm.
Computer Architecture & Operating Systems (BTEESC304)	1	Students will be able to describe the computer architecture and CPU building blocks
	2	Students will be able to draw schematic diagrams of various computer memories
	3	Students will be able to apply operations of control unit and input output of a typical computer architecture.
	4	Students will be able to explain Operating system, thread, process, interprocess communication and solve numerical related to various CPU Scheduling Algorithm
	5	Students will be able to illustrate concepts of Process Synchronization and Deadlocks and Solve associated Numerical
Digital Electronics and Microprocessor (BTEESC305)	1	Students will be able to describe the digital signal, Boolean algebra, number system and solve given problem using above concept.
	2	Students will be able to illustrate working mechanism and design of different combinational logic circuit and their application in digital electronics.
	3	Students will be able to illustrate working mechanism and design of different sequential logic circuit and their application in digital electronics.
	4	Students will be able to explain microprocessor 8085 architecture, addressing modes, memory interfacing, instruction set, and interfacing & develop assembly language programs using various programming tools.
	5	Students will be able to explain microprocessor 8086 architecture, addressing modes, memory interfacing, instruction set, and interfacing and develop assembly language programs using various programming tools.
Electronics Devices and Circuits Lab & Programming Data Structures & Algorithm Using C Lab (BTECPL306)	1	Students will be able to acquire the knowledge of testing and measuring Instrument and FET Devices.
	2	Students will be able to analyze various application using Op-amp.
	3	Students will be able to implement linear and non-linear data structure & analyze their time and space complexity.
	4	Students will be able to implement various searching and sorting algorithms & analyze their time and space complexity.
Seminar-I	1	Students will be able to identify a suitable technical topic of interest which has a potential to be explored.

**CSMSS**

Chhatrapati Shahu Maharaj Shikshan Sanstha's

CHH. SHAHU COLLEGE OF ENGINEERING

Kanchanwadi, Paithan Road, Chh. Sambhajinagar, 431 011

Ph. No. : (0240) 2646373, 9922668199, 2646350 Fax: (0240) 2646222

Website: www.csmssengg.org

Approved by AICTE New Delhi, DTE (Govt. of Maharashtra) and affiliated to Dr. BATU, Lonere (Raigad). **DTE Code: 2533**

	(BTECS307)	2	Students will be able to collect literature survey of the selected topic in order to review the current development and identify the future scope.
		3	Students will be able to elaborate the technical description, regarding the topic by preparing a formal report.
		4	Students will be able to prepare and deliver effective presentation on the selected topic in order to improve soft skills.
		5	Students will be able to make use of new & recent technology for creating technical report.
IV	Python Programming (BTEPC401)	1	Students will be able to display message on screen using python script on IDE.
		2	Students will be able to write python program to demonstrate use of operators.
		3	Students will be able to perform operations on data structures in python.
		4	Students will be able to develop functions, modules, and packages for given problem.
		5	Students will be able to design classes for given problem and handle exceptions as required.
	Database Management System (BTEPC402)	1	Students will be able to describe various components of database system architecture.
		2	Students will be able to apply SQL queries to interact with relational database.
		3	Students will be able to describe normal forms and define various keys in database.
		4	Students will be able to explain database transactions and concurrent control techniques.
		5	Students will be able to perform CRUD operations to interact with No-SQL database.
	Basic Human Rights (BTHM403)	1	Students will be able learn to express the history of Human rights.
		2	Students will be able to learn to respects others caste, religion, region, and culture.
		3	Students will be aware of their rights as Indian citizen.
		4	Students will be able to explain the importance of groups and communities in the society.
		5	Students will be able to realize the philosophical and cultural basis and historical perspectives of human rights.
Probability Theory & Random Processes (BTBS404)	1	Students will be able to apply fundamental concepts of probability, Bayes' theorem, and standard probability distributions to describe real-life phenomena.	
	2	Students will be able to utilize the basic concepts of probability distributions and random variables to solve engineering problems.	



CSMSS

Chhatrapati Shahu Maharaj Shikshan Sanstha's

CHH. SHAHU COLLEGE OF ENGINEERING

Kanchanwadi, Paithan Road, Chh. Sambhajinagar, 431 011

Ph. No. : (0240) 2646373, 9922668199, 2646350 Fax: (0240) 2646222

Website: www.csmssengg.org



Approved by AICTE New Delhi, DTE (Govt. of Maharashtra) and affiliated to Dr. BATU, Lonere (Raigad). DTE Code: 2533

		3	Students will be able to apply the concepts of correlation and their applications in engineering disciplines.
		4	Students will be able to interpret the concepts of linear regression, including regression lines and coefficients, in practical scenarios.
		5	Students will be able to apply estimation techniques and hypothesis testing to draw conclusions and assess errors in statistical analyses.
Data Analysis (BTECPE405B)		1	Students will be able to evaluate statistical methods, identify potential biases and misinterpretations in data analysis & apply appropriate sampling techniques for effective data collection.
		2	Students will be able to calculate and interpret measures of central tendency, spread, and distribution shape, enabling them to summarize and describe datasets effectively.
		3	Students will be able to perform and interpret various data transformation techniques to enhance the suitability of data for statistical analysis.
		4	Students will be able to conduct and interpret classical statistical tests, enabling them to evaluate hypotheses and analyze categorical data effectively.
		5	Students will be able to implement and interpret ANOVA and ANCOVA methods, to assess differences between groups and control for confounding variables in complex datasets.
Linux Operating System (BTECPE405D)		1	Students will be able to demonstrate use of various Linux commands to manipulate system operations at admin level.
		2	Students will be able to apply Linux commands to write shell programming.
		3	Students will be able to use various system calls to manipulate Linux file system.
		4	Students will be able to demonstrate various process signals that can be used to control various processes for synchronization.
		5	Students will be able to use various IPC status commands.
Python Programming Lab & Database Management System Lab (BTECPL406)		1	Students will be able to develop algorithmic solutions to simple computational problems.
		2	Students will be able to perform Operations On Data Structures Design Functions, Modules, and Classes in Python.
		3	Students will be able to explain database architecture and illustrate database installation on given platform.
		4	Students will be able to perform SQL and No-SQL database operations
		5	Students will be able to describe database normalization, entity-relationship modeling and transactions.



CSMSS
Chhatrapati Shahu Maharaj Shikshan Sanstha's
CHH. SHAHU COLLEGE OF ENGINEERING

Kanchanwadi, Paithan Road, Chh. Sambhajinagar, 431 011
Ph. No. : (0240) 2646373, 9922668199, 2646350 Fax: (0240) 2646222
Website: www.csmssengg.org



Approved by AICTE New Delhi, DTE (Govt. of Maharashtra) and affiliated to Dr. BATU, Lonere (Raigad). **DTE Code: 2533**

	Seminar-II (BTECS407)	1	Students will be able to establish motivation for any topic of interest and develop a thought process for technical presentation.
		2	Students will be able to deliver effective presentation and improve soft skills.
		3	Students will be able to analyze and comprehension of proof-of-concept and related data.
		4	Students will be able to demonstrate a sound technical knowledge of their selected seminar topic.
		5	Make use of new and recent technology for creating technical reports
V	Computer Networks and Cloud Computing (BTECPC501)	1	Students will be able to describe the concept of Computer Network and Standard Reference Models.
		2	Students will be able to discuss the Protocols of Data Link Layer and Network Layer
		3	Students will be able to illustrate the Transport Layer and Application Layer and their protocols
		4	Students will be able to differentiate Cloud Computing Environments.
		5	Students will be able to describe the concept of virtualization.
	Digital Signal & Image Processing (BTECPC502)	1	Students will be able to illustrate the different types of discrete-time signals and systems
		2	Students will be able to apply different transforms and convolution tools for analysis of discrete signals and systems
		3	Students will be able to identify the relationship between the pixels and apply basic operations on image.
		4	Students will be able to apply the various image processing algorithms in spatial and frequency domain.
		5	Students will be able to analyze the image segmentation and morphological operations performed on image.
	Software Engineering (BTECPE503D)	1	Students will be able to apply software process models and ethical principles to manage professional software development and adapt to changes in project environments.
		2	Students will be able to apply agile methods and requirements engineering processes to manage software projects.
		3	Students will be able to develop system modeling techniques and architectural design principles to create effective software architectures.
		4	Students will be able to Design object-oriented systems using UML and design patterns, while addressing implementation issues and incorporating open-source development practices.



CSMSS
Chhatrapati Shahu Maharaj Shikshan Sanstha's
CHH. SHAHU COLLEGE OF ENGINEERING

Kanchanwadi, Paithan Road, Chh. Sambhajinagar, 431 011
Ph. No. : (0240) 2646373, 9922668199, 2646350 Fax: (0240) 2646222
Website: www.csmssengg.org



Approved by AICTE New Delhi, DTE (Govt. of Maharashtra) and affiliated to Dr. BATU, Lonere (Raigad). **DTE Code: 2533**

	5	Students will be able Evaluate various software testing methods to ensure dependability, availability, reliability, safety, and security in software systems.
Programming in Java (BTECOE504C)	1	Students will be able to describe JVM architecture, apply java tokens to write and compile basic Java programs using command line.
	2	Students will be able to create class and objects and compile java programs using an IDE.
	3	Students will be able to demonstrate the concepts of Inheritance & interface in Java programming
	4	Students will be able to illustrate multithreading with java programs and use exception handling to handle various exceptions.
	5	Students will be able to create GUIs and interact with database using JDBC.
Economics and Management (BTECHM505A)	1	Students will be able to analyze the fundamental concepts of Managerial economics and demand.
	2	Students will be able to analyze economic information and develop the solution of micro and macro-economic problems.
	3	Students will be able to evaluate future demand, Production & the foundational concepts of cost, market structure and role of pricing methods in business.
	4	Students will be able to identify economic problems to be analyzed and understand how theoretical framework and actual empirical conditions are connected.
	5	Students will be able to illustrate human resource management functions in an organization & scope of marketing, societal, ethical and other diverse aspects of marketing and production.
Computer Networks & Cloud Computing & Competitive Programming Lab (BTECPC501)	1	Students will be able to demonstrate Crimping.
	2	Students will be able to use the packet tracer for computer networks.
	3	Students will be able to illustrate the different protocols used in computer networks.
	4	Students will be able to classify the factors affecting performance of a program.
	5	Students will be able to measure the effectiveness of optimization of programs.
Mini Project-I Lab (BTECM507)	1	Students will be able to practice acquired knowledge within the chosen area of technology for project development.
	2	Students will be able to identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
	3	Students will be able to reproduce, improve and refine technical aspects for engineering projects.
	4	Students will be able to work as an individual or in a team in development of technical projects.



CSMSS
Chhatrapati Shahu Maharaj Shikshan Sanstha's
CHH. SHAHU COLLEGE OF ENGINEERING

Kanchanwadi, Paithan Road, Chh. Sambhajinagar, 431 011
Ph. No. : (0240) 2646373, 9922668199, 2646350 Fax: (0240) 2646222
Website: www.csmssengg.org



Approved by AICTE New Delhi, DTE (Govt. of Maharashtra) and affiliated to Dr. BATU, Lonere (Raigad). **DTE Code: 2533**

		5	Students will be able to communicate and report effectively project related activities and findings.
	Internet of Things (BTECPC601)	1	Students will be able to describe the concept of Internet of Things and its areas.
		2	Students will be able to illustrate the basics of C and Node MCU.
		3	Students will be able to apply basics of Python to Raspberry Pi.
		4	Students will be able to predict the interaction of web services and IoT.
		5	Students will be able to illustrate the various IoT applications.
	Artificial Intelligence and Machine Learning (BTECPC602)	1	Students will be able to analyze the foundational concepts, historical development, and future implications of artificial intelligence, including the stages of AI and the structure of intelligent agents.
		2	Students will be able to evaluate various search methods and techniques, including state space search, heuristic search, and randomized search, to identify optimal solutions for problem-solving scenarios.
		3	Students will be able to apply fundamental concepts of machine learning, including types of learning, evaluation methods, and various algorithms such as linear regression and decision trees.
		4	Students will be able to assess the performance of machine learning models using appropriate metrics for both classification and regression problems.
		5	Students will be able to Implement linear and logistic regression techniques, including the analysis of cost functions, optimal coefficients, and handling classification problems.
	Software Testing (BTECPE603D)	1	Student will be able to define key terms related to software testing, including testing methodologies, life cycle models, and testing phases.
		2	Student will be able to explain the differences between white box and black box testing methods.
		3	Student will be able to apply different testing techniques, such as top-down and bottom-up integration testing, in practical scenarios.
		4	Student will be able to analyze the factors affecting performance testing and regression testing methodologies.
		5	Student will be able to evaluate the effectiveness of functional and non-functional testing in software projects.
Android Programming (BTECOE604C)	1	Students will be able to explain the architecture and components of the Android Operating System	
	2	Students will be able to develop advance user interfaces using Android Studio, including layout design and basic UI elements.	
	3	Students will be able to describe Memory and File operations in Android.	



CSMSS

Chhatrapati Shahu Maharaj Shikshan Sanstha's

CHH. SHAHU COLLEGE OF ENGINEERING

Kanchanwadi, Paithan Road, Chh. Sambhajinagar, 431 011

Ph. No. : (0240) 2646373, 9922668199, 2646350 Fax: (0240) 2646222

Website: www.csmssengg.org



Approved by AICTE New Delhi, DTE (Govt. of Maharashtra) and affiliated to Dr. BATU, Lonere (Raigad). DTE Code: 2533

		4	Students will be able to analyze and implement data storage solutions in Android using SQLite and shared preferences to meet the data persistence needs of applications.
		5	Students will be able to design and implement a complete Android application that integrates third-party APIs, such as Google Maps to solve a real-world problem such as telephony, hardware etc.
	VLSI Design (BTECOE604A)	1	Students will be able to explain fabrication process and electrical characteristics of various IC technologies.
		2	Students will be able to draw stick diagrams and layout of simple CMOS logic circuits.
		3	Students will be able to analyze basic logic gates and alternate gate circuits using gate level design.
		4	Students will be able to illustrate building blocks of data path subsystems and array subsystems.
		5	Students will be able to apply the CMOS and PLD knowledge to design Programmable Logic Devices based applications and CMOS testing.
	Development Engineering (BTECHM605A)	1	Students will be able to evaluate & improve the skills of development engineering
		2	Students will be able to analyze the knowledge of world poverty & development.
		3	Students will be able to create awareness about social justice.
		4	Students will be able to apply development strategies.
		5	Students will be able to describe engineering for sustainable community development.
	Internet of Things & Artificial Intelligence and Machine Learning Lab (BTECPC601)	1	Students will be able to Illustrate the basics of C and NODE MCU
		2	Students will be able to apply basics of Python programming for RASPBERRY PI.
		3	Students will be able to Demonstrate in wireless communication and social media integration, preparing them for real-world IoT and automation projects.
4		Students will Develop a solid foundation in Python programming and data science methodologies, equipping them for real-world data analysis and machine learning tasks.	
5		Students will Develop hands-on skills in machine learning techniques and tools, preparing them for real-world data science projects.	
		1	Students will be able to practice acquired knowledge within the chosen area of technology for project development.



CSMSS
Chhatrapati Shahu Maharaj Shikshan Sanstha's
CHH. SHAHU COLLEGE OF ENGINEERING

Kanchanwadi, Paithan Road, Chh. Sambhajinagar, 431 011
Ph. No. : (0240) 2646373, 9922668199, 2646350 Fax: (0240) 2646222
Website: www.csmssengg.org



Approved by AICTE New Delhi, DTE (Govt. of Maharashtra) and affiliated to Dr. BATU, Lonere (Raigad). **DTE Code: 2633**

	Mini Project-II (BTECM607)	2	Students will be able to identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
		3	Students will be able to reproduce, improve and refine technical aspects for engineering projects.
		4	Students will be able to work as an individual or in a team in development of technical projects.
		5	Students will be able to communicate and report effectively project related activities and findings.
VII (ETC)	Microwave Engineering (BTETC701)	1	Students will be able to describe the wave equation in wave guide for analysis
		2	Students will be able to differentiate microwave components and devices in microwave applications.
		3	Students will be able to describe working principles of all the microwave tubes
		4	Students will be able to describe working principles of all the solid-state devices.
		5	Students will be able to illustrate a suitable microwave measurement instruments and carry out the required measurements.
	Fiber Optic Communication (BTETPE702D)	1	Students will be able to summaries the fundamental principles of fiber-optic communication systems and describe the application of transmitter, receiver and amplifier.
		2	Students will be able to Describe the fundamental properties of optical fibers, including core and cladding refractive indices, modes of propagation, attenuation, and dispersion.
		3	Students will be Explain the operating principles of lasers, light-emitting diodes (LED s), and optical detectors and applications in optical communication systems.
		4	Students will be able to analyze the impact of optical switches and optical amplifiers on the performance of optical networks, including effects on signal integrity, network speed, and data handling capacities.
		5	Students will be able to propose techniques to mitigate non-linear effects and manage group velocity dispersion in high-speed optical communication systems.
Mobile Computing (BTETOE703D)	1	Students will be able to discuss various Terms Related To Mobile Computing.	
	2	Students will be able to choose mac protocol depending on scheme required	
	3	Students will be able to differentiate mobile IP & computer network IP	
	4	Students will be able to elaborate various ad-hoc networks and their use cases	
	5	Students will be able to compare various operating systems used in mobile devices	



CSMSS

Chhatrapati Shahu Maharaj Shikshan Sanstha's

CHH. SHAHU COLLEGE OF ENGINEERING

Kanchanwadi, Paithan Road, Chh. Sambhajinagar, 431 011

Ph. No. : (0240) 2646373, 9922668199, 2646350 Fax: (0240) 2646222

Website: www.csmssengg.org



Approved by AICTE New Delhi, DTE (Govt. of Maharashtra) and affiliated to Dr. BATU, Lonere (Raigad). DTE Code: 2533

E Waste Management (BTETOE704F)	1	Students will be able to describe the environmental Impacts of E Waste.	
	2	Students will be able to discuss various concept learned under E-Waste Management hierarchy.	
	3	Students will be able to distinguish the role of various national and international act and laws applicable for E-Waste Management.	
	4	Students will be able to illustrate E-Waste Management measures proposed under national and global legislations.	
	Engineering Economics and Financial Mathematics (BTHM705)	1	Students will be able to evaluate the economic theories, cost concepts and pricing policies
		2	Students will be able to Identify the market structures , integration concepts, the measures of national income, the functions of banks and concepts of globalization
		3	Students will be able to apply the concepts of financial management for project appraisal, legal and regulatory issues applied to economic investment.
		4	Students will be able to analyze financial statements using ratio analysis & accounting system.
		5	Students will be able to analyze the impact of inflation, taxation, depreciation. Financial planning, economic basis for replacement & project scheduling.
	Microwave Engineering Lab (BTETC701)	1	Students will be able to describe the wave equation in wave guide for analysis
		2	Students will be able to differentiate microwave components and devices in microwave applications.
		3	Students will be able to describe working principles of all the microwave tubes.
4		Students will be able to describe working principles of all the solid-state devices.	
5		Students will be able to illustrate a suitable microwave measurement instruments and carry out the required measurements.	


Prof.D.D.Darp

Dept NAAC 2.0 Coordinator


Prof.V.K.Bhosale

Dept Academic Coordinator


Dr.D.L.Bhuyar

HOD

