

Department of Computer Science & Information Technology

Bachelor of Technology in Computer Science & Engineering

Program Outcomes

POs:

[PO.1]. Engineering knowledge: An ability to apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to get the solution of the engineering problems.

[PO.2]. Problem analysis: Ability to Identify, formulates, review research literature, and analyze complex engineering problems.

[PO.3]. Design/Development of Solutions: Ability to design solutions for complex Engineering Problems by considering social, Economic and Environmental aspects.

[PO.4]. Conduct investigations of complex problems: Use research-based knowledge to design, conduct analyze experiments to get valid conclusion.

[PO.5]. Modern tool usage: ability to create, select, and apply appropriate techniques, and to model complex engineering activities with an understanding of the limitations.

[PO.6]. The engineer and society: Ability to apply knowledge by considering social health, safety, legal and cultural issues.

[PO.7]. Environment and sustainability: Understanding of the impact of the adopted engineering solutions in social and environmental contexts.

[PO.8]. Ethics: Understanding of the ethical issues of the civil engineering and applying ethical principles in engineering practices.

[PO.9]. Individual and teamwork: Ability to work effectively as an individual or in team, as a member or as a leader.

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[PO.10]. Communication: An ability to communicate clearly and effectively through different modes of communication.

[PO.11]. Project management and finance: Ability to handle project and to manage finance related issue.

[PO.12]. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning.

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Program Specific Outcomes

PSOs:

[PSO.1]. Understand the principles, architecture and organization of computers, embedded systems and computer networks.

[PSO.2]. Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems that include both hardware and software.

[PSO.3]. Apply software design and development practices to develop software applications in emerging areas such as IoT, Data Analytics, Social Networks, Cloud and High Performance Computing.

[PSO.4]. Demonstrate & communicate Ability to demonstrate the knowledge, skill to analyze the cause and effect on Computer Science Engineering.

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Semester I

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Subject: Engineering Chemistry

Code: BTE22011

3 Credits | Semester 1

Course Outcomes: At the end of the course, students will be able to:

- [CO1]** Understand the skills required to succeed in graduate school, the chemical industry or professional school.
- [CO2]** Comprehend the fundamentals of chemistry and critically interpret the primary chemical text.
- [CO3]** Recognize the importance of engineering chemistry in the context of domestic and industrial usage domain.
- [CO4]** Design economic methods of synthesizing new materials and apply their knowledge for protection of environment and application in their field.
- [CO5]** Develop an insight into latest (R&D oriented) topics, to enable the engineering student upgrade the existing technologies and pursue further research.

Subject: Engineering Mathematics-I

Code: BTE21001

Credit - 4 | Semester 1

Course Outcomes: At the end of the course, students will be able to:

- [CO1]** Remember the differential and integral calculus to notions of curvature and to improper integrals.
- [CO2]** Have a basic understanding of Beta and Gamma functions.
- [CO3]** Understand the fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems.
- [CO4]** Demonstrate the tool of power series and Fourier series for learning advanced Engineering Mathematics.
- [CO5]** Analyze functions of several variables that is essential in most branches of engineering

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[CO6] Evaluate the essential tool of matrices and linear algebra in a comprehensive manner.

Subject: Basic Electrical Engineering

Code: BTE21003

Credits- 4 | Semester 1

Course Outcomes: At the end of the course, students will be able to:

- [CO1] Comprehend basic knowledge of electrical quantities such as current, voltage, power, energy and frequency
- [CO2] Predict the behavior of any electrical and magnetic circuits.
- [CO3] Formulate and solve complex AC, DC circuits.
- [CO4] Identify the type of electrical machine used for that particular application.
- [CO5] Realize the requirement of transformers in transmission and distribution of electric power and other applications.

Subject: Engineering Mechanics

Code: BTE22009

Credits- 3 | Semester I

Course Outcomes: At the end of the course, students will be able to:

- [CO1] Identify the force systems for given conditions by applying the basics of mechanics.
- [CO2] Determine unknown force(s) of different engineering systems.
- [CO3] Apply the principles of friction in various conditions for useful purposes.
- [CO4] Find the centroid and center of gravity of various components in engineering systems.
- [CO5] Select the relevant simple lifting machine(s) for given purposes.

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Subject: Engineering Chemistry Lab

Code: BTE22015

Credits- 1 | Semester I

Course Outcomes: At the end of the course, students will be able to:

- [CO1]** Understand the principles of chemistry relevant to the study of science and engineering
- [CO2]** Estimate rate constants of reactions from concentration of reactants/products as a function of time
- [CO3]** Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc.
- [CO4]** Differentiate between hard and soft water, solve the related numerical problems on water purification and comprehend its significance in industry and daily life.

Subject: Basic Electrical Engineering Lab

Code: BTE21005

Credits- 1 | Semester I

Course Outcomes: At the end of the course, students will be able to:

- [CO1]** Understand different meters and instruments for measurement of electrical quantities
- [CO2]** Understand the linear and nonlinear characteristics of different types of loads experimentally
- [CO3]** Design and experiment potential divider circuits
- [CO4]** Experimentally verify the basic circuit theorems
- [CO5]** Measure power and power factor in AC circuits

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Subject: Engineering Mechanics Lab

Code: BTE22013

Credits- 1 | Semester I

Course Outcomes: At the end of the course, students will be able to:

- [CO1]** Identify the force systems for given conditions by applying the basics of mechanics.
- [CO2]** Determine unknown force(s) of different engineering systems.
- [CO3]** Apply the principles of friction in various conditions for useful purposes.
- [CO4]** Find the centroid and centre of gravity of various components in engineering systems.
- [CO5]** Select the relevant simple lifting machine(s) for given purposes

Subject: Engineering Graphics & Design

Code: BTE21004

Credits- 2 | Semester I

Course Outcomes: At the end of the course, students will be able to:

- [CO1]** Perform basic sketching techniques
- [CO2]** Increase understanding related to architectural and engineering scales.
- [CO3]** Draw orthographic projections and sections.
- [CO4]** Draft the engineered drawings in practical application
- [CO5]** Become familiar with office practice and standards.

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Semester II

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Subject: Engineering Physics

Code: BTE22010

4 Credits | Semester II

Course Outcomes: At the end of the course, students will be able to:

- [CO1] Identify and understand the kinds of experimental results, which are incompatible with classical Physics leading to the development of a quantum theory of matter and light.
- [CO2] Use basic concepts to analyze and design a wide range of semiconductor devices.
- [CO3] Understand & solve different types of wave equations.
- [CO4] Use the principles of optics to solve various complex engineering problems.
- [CO5] Use fundamental laws and relations to solve problems in electricity, electromagnetism.

Subject: Engineering Mathematics –II

Code: BTE22008

4 Credits | Semester II

Course Outcomes: At the end of the course, students will be able to

- [CO1] Remember the mathematical tools needed to evaluate the multiple integrals and their usage.
- [CO2] Understand the effective mathematical tools for the solutions of differential equations that model physical processes.
- [CO3] Demonstrate the tools of differentiation and integration of functions of a complex variable that are used in various techniques dealing with engineering problems
- [CO4] Calculate the analytic function.
- [CO5] Evaluate complex integrals by using Cauchy-Goursat integral theorem.

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Subject: Programming for Problem Solving

Code: BTE21259

3 Credits | Semester II

Course Outcomes: At the end of the course, students will be able to:

- [CO1] Formulate simple algorithms for arithmetic and logical problems.
- [CO2] Test and execute the programs and correct syntax and logical errors and implement conditional branching, iteration and recursion
- [CO3] Apply programming to solve matrix addition and multiplication problems as well as searching and sorting problems.
- [CO4] Use arrays, pointers and structures to formulate algorithms and programs
- [CO5] Decompose a problem into functions and synthesize a complete program using divide and conquer approach.
- [CO6] Understand various types of files and operations on them

English for Communication

Code: BTE22370

3 Credits | Semester II

Course Outcomes: At the end of the course, students will be able to:

- [CO1] Understand the basics of communication and represent communication process as well as know about its practical implementations at the work place.
- [CO2] Understand verbal and non-verbal modes of communication effectively in practical situations
- [CO3] Analyze vocalic and basic grammar.
- [CO4] Become competent in reading and writing.
- [CO5] Evaluate the process of speaking.

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Subject: Constitution of India

Code: BTE25095

0 Credits | Semester II

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand the emergence and evolution of the Indian Constitution.

[CO2] Understand and analyse federalism in the Indian context

[CO3] Understand and explain the significance of Indian Constitution as the fundamental law of the land.

[CO4]. Exercise fundamental rights in proper sense and at the same time identify with responsibilities towards the process of nation building.

[CO5] Analyse the Indian political system, the powers and functions of the Union, State and Local Governments in detail

[CO6] Understand the Electoral Process, Emergency provisions and the Amendment procedure.

Subject: Engineering Physics Lab

Code: BTE21261

1 Credits | Semester II

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand calculation of specific resistance of wire by Carey Foster bridge

[CO2] Calculate thermal conductivity of poor conductors

[CO3] Measure resonance frequency and quality factor of LCR Circuit & RC circuit with A/C current

[CO4] Understand the characteristics of transistors, photoelectric cells and determine operational parameters associated with their performance.

[CO5] Work with laboratory sodium light and lasers and understand the method to measure the wavelength of the light emitted from a laser and sodium light.

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Subject: Programming for Problem Solving Lab

Code: BTE21262

Credits- 2 | Semester II

Course Outcomes: At the end of the course, students will be able to

- [CO1]** Formulate simple algorithms for arithmetic and logical problems, translate the algorithms to programs (in C language), test and execute the programs and correct syntax and logical errors.
- [CO2]** Program for solving simple numerical method problems, namely root finding of function, differentiation of function and simple integration.
- [CO3]** Decompose a problem into functions and synthesize a complete program using divide and conquer approach.
- [CO4]** Analyze the complexity of problems, modularize the problems into small modules and then convert them into programs.

Subject: Engineering Workshop Practice

Code: BTE22267

2 Credits | Semester II

Course Outcomes: At the end of the course, students will be able to;

- [CO1]** Acquire skills in basic engineering practice to identify, select and use various marking, measuring, and holding, striking and cutting tools & equipment and machines
- [CO2]** Understand job drawing and complete jobs as per specifications in allotted time
- [CO3]** Inspect the job for the desired dimensions and shape
- [CO4]** Operate, control different machines and equipment by adopting safety practices

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Semester III

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Subject: Analog Electronic Circuits

Code: BTE23027

3 Credits | Semester III

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand the characteristics of transistors.

[CO2] Design and analyze various rectifier and amplifier circuits.

[CO3] Design sinusoidal and non-sinusoidal oscillators.

[CO4] Understand the functioning of OP-AMP and design OP-AMP based circuits.

Subject: Engineering Mathematics III

Code: BTE23031

4 Credits | Semester III

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand the concept of partial differential equations.

[CO2] Apply concept of differential equation for solving general engineering problems.

[CO3] Understand the theory of probability and its applications on engineering problems.

[CO4] Apply the concept of statics in data sampling.

[CO5] Understand the theory of data distribution, standard deviation and different charts.



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Subject: Data Structure

Code: BTE23028

3 Credits | Semester III

Course Outcomes: At the end of the course, students will be able to

[CO1] Analyze the algorithms to determine the time and computation complexity and justify the correctness.

[CO2] Design and implement data structures related to search problems

[CO3] Implement, analyze and determine the time and computation complexity for a given problem of Stacks, Queues and linked list

[CO4] Understand logic behind various sorting algorithms and compute the time complexity

[CO5] Learn and implement Graph search and traversal algorithms and determine the time and computation complexity.

Subject: Digital Electronics

Code: BTE23029

3 Credits | Semester III

COURSE OUTCOMES: By the end of this course, students will be able to:

[CO1] Understand working of logic families and logic gates.

[CO2] Design and implement Combinational and Sequential logic circuits

[CO3] Understand the process of Analog to Digital conversion and Digital to Analog conversion.

[CO4] Be able to use PLDs to implement the given logical problem.

[CO5] Select relevant hydraulic pumps for different applications.

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Subject: Environmental Science

Code: BTE24085

0 Credits | Semester III

COURSE OUTCOMES: By the end of this course, students will be able to:

- [CO1] Understand the ecosystem and related terminology
- [CO2] Understand the ecosystem knowledge to produce eco-friendly products
- [CO3] Understand the suitable extent of air & noise pollution and control related measures and acts.
- [CO4] Understand the suitable extent of water and soil pollution and control related measures and acts.
- [CO5] Understand different renewable energy resources and efficient process of harvesting.

Subject: Python Programming

Code: BTE23391

3 Credits | Semester III

Course Outcomes: At the end of the course, students will be able to

- [CO1] Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
- [CO2] Express proficiency in the handling of strings and functions.
- [CO3] Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.
- [CO4] Design and identify the commonly used operations involving file systems and regular expressions.
- [CO5] Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python.



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Subject: Professional Practice, Law & Ethics

Code: BTE25299

3 Credits | Semester III

Course Outcomes: At the end of the course, students will be able to

- [CO1] Define what constitutes Professional practice and the respective roles of various stakeholders.
- [CO2] Execute the types of roles they are expected to play in the society as practitioners of Computer Science Engineering profession.
- [CO3] Evaluate the different Intellectual Property Rights, Patents etc.
- [CO4] Develop good ideas of the legal, ethical and practical aspects of their profession.

Subject: Organizational Behavior

Code: BTE24060

3 Credits | Semester III

Course Outcomes: At the end of the course, students will be able to

- [CO1] Define the key ideas and issues in OB.
- [CO2] Interpret the dynamics of human behavior in work context.
- [CO3] Examine the determinants of work behavior from different levels.
- [CO4] Judge the issues in OB that influence the way people behave in an organizational setting.
- [CO5] Develop competencies of analyzing behavioral issues in the work environment



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Subject: Analog Electronics Lab

Code: BTE23033

2 Credits | Semester III

Course Outcomes: At the end of the course, students will be able to

- [CO1] Exhibit competency in embedded system domain
- [CO2] Exhibit competency in RF& Signal processing domain
- [CO3] Determine the correctness of readings.
- [CO4] Design, construct, and take measurement of various analog circuits to compare

Subject: Data Structures Lab

Code: BTE23034

2 Credits | Semester III

Course Outcomes: At the end of the course, students will be able to

- [CO1] Design and analyze the time and space efficiency of the data structure.
- [CO2] Identify appropriate data structure for a given problem
- [CO3] Write complex applications using structured programming methods
- [CO4] Understand and apply fundamental algorithmic problems including Tree traversals, Graph traversals.
- [CO5] Understand which algorithm or data structure to use in different scenarios.



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Subject: Digital Electronics Lab

Code: BTE23035

2 Credits | Semester III

Course Outcomes: At the end of the course, students will be able to

[CO1] Distinguish between analog and digital systems.

[CO2] Identify the various digital ICs and understand their operation.

[CO3] Apply Boolean laws to simplify the digital circuits.

[CO4] Design simple logic circuits

Subject: Python Programming Lab

Code: BTE23392

2 Credits | Semester III

Course Outcomes: At the end of the course, students will be able to

[CO1] Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.

[CO2] Demonstrate proficiency in handling Strings and File Systems.

[CO3] Create, run and manipulate Python Programs using core data structures like Lists,

Dictionaries and use Regular Expressions.

[CO4] Understand the basic concepts scripting and the contributions of scripting language

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Subject: IT Workshop (MATLAB)

Code: BTE23271

1 Credits | Semester III

Course Outcomes: At the end of the course, students will be able to:

- [CO1] Understand the need of simulation/implementation for the verification of mathematical functions.
- [CO2] Understand the main features of the MATLAB/ SCILAB program development environment to enable their usage in the higher learning.
- [CO3] Implement simple mathematical functions/equations in numerical computing environment such as MATLAB/ SCILAB.
- [CO4] Interpret and visualize simple mathematical functions and operations thereon using plots/ display.
- [CO5] Analyze the program for correctness and determine/estimate/predict the output and verify it under simulation environment using MATLAB/ SCILAB tools.

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Semester IV

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Subject: Discrete Mathematics

Code: BTE24065

4 Credits | Semester IV

Course Outcomes: At the end of the course, students will be able to

- [CO1] Understand the logic sentence expressed it in terms of predicates, quantifiers, and logical connectives
- [CO2] Analyze the problem, derive the solution using deductive logic and prove the solution based on logical inference.
- [CO3] Analyze the mathematical problem, classify its algebraic structure
- [CO4] Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra
- [CO5] Develop the given problem as graph networks and solve with techniques of graph theory

Subject: Computer Organization & Architecture

Code: BTE24066

3 Credits | Semester IV

Course Outcomes: At the end of the course, students will be able to

- [CO1] Draw the functional block diagram of a single bus architecture of a computer and describe the function of the instruction execution cycle
- [CO2] Write assembly language program for specified microprocessor for computing 16-bit multiplication, division and I/O device interface (ADC, Control circuit, serial port communication)
- [CO3] Write a flowchart for Concurrent access to memory and cache coherency in Parallel Processors and describe the process.
- [CO4] Design a memory module and analyze its operation by interfacing with the CPU

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Subject: Operating Systems

Code: BTE24067

3 Credits | Semester IV

Course Outcomes: At the end of the course, students will be able to

[CO1] Identify mechanisms to create processes and threads.

[CO2] Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time

[CO3] For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time

[CO4] Design and implement file management system

[CO5] Develop the I/O management functions in OS as part of a uniform device abstraction by performing operations for synchronization between CPU and I/O controllers.

Subject: Design and Analysis of Algorithms

Code: BTE24068

3 Credits | Semester IV

Course Outcomes: At the end of the course, students will be able to

[CO1] Formulate simple algorithms for arithmetic and logical problems.

[CO2] Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it and synthesize divide-and-conquer algorithms.

[CO3] Describe the greedy paradigm and explain when an algorithmic design situation calls for it and develop the greedy algorithms for a given problem.

[CO4] Use graph and write the corresponding algorithm to solve the problems for a given engineering problem model

[CO5] Decompose a problem into functions and synthesize a complete program using divide and conquer approach

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Subject: Microprocessor & Microcontroller

Code: BTE24393

3 Credits | Semester IV

Course Outcomes: At the end of the course, students will be able to

- [CO1]** Assess and solve basic binary math operations using the microprocessor and explain the microprocessor's and Microcontroller's internal architecture and its operation within the area of manufacturing and performance.
- [CO2]** Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor and microcontroller.
- [CO3]** Compare accepted standards and guidelines to select appropriate Microprocessor (8085 & 8086) and Microcontroller to meet specified performance requirements
- [CO4]** Analyze assembly language programs; select appropriate assemble into machine a cross assembler utility of a microprocessor and microcontroller.
- [CO5]** Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to external devices.

Subject: Software Engineering

Code: BTE24394

3 Credits | Semester IV

Course Outcomes: At the end of the course, students will be able to

- [CO1]** Interpret, plan, and develop the frame work of a software engineering project.
- [CO2]** Monitor & manage the risk during the design of software project.
- [CO3]** Calculate the cost of software, using cost estimation models such as COCOMO II.
- [CO4]** Identify and apply testing strategies & methods on software projects.
- [CO5]** Implement clean room techniques to develop as well as maintain software throughout its lifetime.

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Subject: Operating Systems Lab

Code: BTE24070

0 Credits | Semester IV

Course Outcomes: At the end of the course, students will be able to

[CO1] Know how data is transmitted and check for errors

[CO2] Inter process communication including shared memory, pipes and messages

[CO3] Simulate CPU Scheduling Algorithms (FCFS, RR, SJF, Priority, Multilevel Queuing)

[CO4] Simulate banker's algorithm for deadlock avoidance, prevention Program for FIFO, LRU, and optimal page replacement algorithm

Subject: Design and Analysis of Algorithms Lab

Code: BTE24071

2 Credits | Semester IV

Course Outcomes: At the end of the course, students will be able to

[CO1] Analyze the performance of algorithms.

[CO2] Choose appropriate algorithm design techniques for solving problems.

[CO3] Understand how the choice of data structures and the algorithm design methods impact the performance of programs.

[CO4] Write rigorous correctness proofs for algorithms.



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Subject: Computer Organization & Architecture Lab

Code: BTE24279

2 Credits | Semester IV

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand the theory and architecture of central processing unit

[CO2] Analyze some of the design issues in terms of speed, technology, cost, performance.

[CO3] Design a simple CPU with applying the theory concepts

[CO4] Use appropriate tools to design verify and test the CPU architecture



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Semester V



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Subject: Signals & Systems

Code: BTE25294

3 Credits | Semester V

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand the concepts of continuous time and discrete time systems.

[CO2] Comprehend sampling theorem and its implications.

[CO3] Analyze systems in complex frequency domain.

[CO4] Understand the concept of Fourier transform and its implementation

Subject: Database Management System

Code: BTE25101

3 Credits | Semester V

Course Outcomes: At the end of the course, students will be able to

[CO1] Describe the fundamental elements of relational database management systems

[CO2] Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.

[CO3] Design ER-models to represent simple database application scenarios

[CO4] Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.

[CO5] Improve the database design by normalization.

[CO6] Familiarize with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing.

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Subject: Formal Language and Automata Theory

Code: BTE25102

3 Credits | Semester V

Course Outcomes: At the end of the course, students will be able to

- [CO1] Write a formal notation for strings, languages and machines.
- [CO2] Design finite automata to accept a set of strings of a language.
- [CO3] Determine whether the given language is regular or not.
- [CO4] Design context free grammars to generate strings of context free language.
- [CO5] Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars.
- [CO6] Write the hierarchy of formal languages, grammars and machines. Distinguish between computability & non-computability and Decidability & undecidability.

Subject: Object Oriented Programming

Code: BTE25295

3 Credits | Semester V

Course Outcomes: At the end of the course, students will be able to

- [CO1] Specify simple abstract data types and design implementations, using abstraction functions to document them.
- [CO2] Recognize features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity.
- [CO3] Name and apply some common object-oriented design patterns and give examples of their use.
- [CO4] Design applications with an event-driven graphical user interface

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Subject: Soft Skills and Interpersonal Communication

Code: BTE25386

3 Credits | Semester V

Course Outcomes: At the end of the course, students will be able to

- [CO1]** Comprehend the Corporate communication culture.
- [CO2]** Understand the significance of soft skills and implement the same in their personalities
- [CO3]** Develop etiquettes towards corporate email, mobile and telephone.
- [CO4]** Judge presentation and interpersonal communication skills of individuals.
- [CO5]** Write business reports and proposals as expected from a corporate professional.

Subject: Graph Theory

Code: BTE26148

3 Credits | Semester V

Course Outcomes: At the end of the course, students will be able to

- [CO1]** Write precise and accurate mathematical definitions of objects in graph theory.
- [CO2]** Use mathematical definitions to identify and construct examples and to distinguish examples from non-examples.
- [CO3]** Validate and critically assess a mathematical proof.
- [CO4]** Use a combination of theoretical knowledge and independent mathematical thinking in creative investigation of questions in graph theory.



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Subject: Image Processing

Code: BTE27332

3 Credits | Semester V

Course Outcomes: At the end of the course, students will be able to

[CO1] Review the fundamental concepts of a digital image processing system

[CO2] Analyze images in the frequency domain using various transforms.

[CO3] Evaluate the techniques for image enhancement and image restoration.

[CO4] Categorize various compression techniques.

[CO5] Interpret Image compression standards.

Subject: Advanced Algorithms

Code: BTE26147

3 Credits | Semester V

Course Outcomes: At the end of the course, students will be able to

[CO1] Analyze a variety of algorithms with practical applications and the resource requirements of each.

[CO2] Determine the most suitable algorithm for any given task and then apply it to the problem.

[CO3] Demonstrate adequate comprehension of the theory of intractability and prove when certain kinds of problems are intractable.

[CO4] Design and analyze programming problem statements.



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Subject: Data Base Management System Lab

Code: BTE25108

2 Credits | Semester V

Course Outcomes: At the end of the course, students will be able to

[CO1] Describe the fundamental elements of relational database management systems

[CO2] Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL

[CO3] Design ER-models to represent simple database application scenarios

[CO4] Improve the database design by normalization.



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Semester VI

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Subject: Compiler Design

Code: BTE26137

3 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

[CO1] Develops the lexical analyzer, for a given grammar specification.

[CO2] Design top-down and bottom-up parsers, for a given parser specification.

[CO3] Develop syntax directed translation schemes

[CO4] Develop algorithms to generate code for a target machine

Subject: Computer Networks

Code: BTE26138

3 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

[CO1] Explain the functions of the different layer of the OSI Protocol.

[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.

[CO3] Design it based on the market available component, for a given requirement (small scale) of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANS)

[CO4] Develop the network programming, for a given problem related TCP/IP protocol.

[CO5] Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.



Department of Computer Science & Information Technology

Subject: Artificial Intelligence

Code: BTE26139

3 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

- [CO1] Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
- [CO2] Apply basic principles of AI in solutions that require problem solving
- [CO3] Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models
- [CO4] Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.
- [CO5] Demonstrate proficiency in applying scientific method to models of machine learning.

Subject: Machine Learning

Code: BTE26140

2 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

- [CO1] Demonstrate fundamental understanding of the history of Machine Learning and its foundations.
- [CO2] Identify machine-learning techniques suitable for a given problem
- [CO3] Solve the problems using various machine-learning techniques
- [CO4] Apply Dimensionality reduction techniques.
- [CO5] Design application using machine learning techniques.



Department of Computer Science & Information Technology

Subject: Neural Network and Deep Learning

Code: BTE26313

3 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

- [CO1] Identify the deep learning algorithms which are more appropriate for various types of learning tasks in various domains.
- [CO2] Implement deep learning algorithms and solve real-world problems.
- [CO3] Solve problems in linear algebra, probability, optimization, and machine learning.
- [CO4] Evaluate, in the context of a case study, the advantages and disadvantages of deep learning neural network architectures and other approaches.

Subject: Web Technology

Code: BTE26142

3 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

- [CO1] Develop a dynamic webpage and DHTML.
- [CO2] Write a well formed / valid XML document
- [CO3] Write a server side java application called Servlet to catch form data sent from client, process it and store it on database.
- [CO4] Write a server side java application called Servlet to catch form data sent from client, process it and store it on database.



Department of Computer Science & Information Technology

Subject: Advanced Java Programming

Code: BTE26144

3 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

[CO1] Develop Swing-based GUI

[CO2] Organizing and Managing a Small Business.

[CO3] Understand the Financial Planning and Control.

[CO4] Think and introduce New Product or Service Development.

[CO5] Execute Strategic Marketing Planning.

Subject: Human Resource Development & Organizational Behavior

Code: BTE26387

3 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand the dynamics of human behaviour in work context.

[CO2] Understand the determinants of work behaviour from different levels.

[CO3] Develop competencies of analyzing behavioral issues in the work environment

[CO4] Expose students to key ideas and issues in OB that influence the way people behave in organizational setting

Department of Computer Science & Information Technology

Subject: Advanced Algorithm

Code: BTE26147

3 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand and devise recurrence relations and amortized cost of various operations

[CO2] Illustrate graph algorithms such as Bellman-Ford, Shortest path, and bipartite matching, B-trees, Red-Black trees and hashing techniques.

[CO3] Identify the methods for solving modular linear equations, Chinese remainder theorem and RSA cryptosystem, Describe types of heaps such as Binomial and Fibonacci heaps.

[CO4] Assess the string-matching algorithms such as Boyer-Moore and Knuth-Morris-Pratt algorithm.

[CO5] Compose mathematical models, objective functions and constraints to solve algorithmic puzzles.

Subject: Visual Programming

Code: BTE26141

3 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand and demonstrate knowledge of programming terminology and how applied using Visual Programming.

[CO2] Illustrate and develop a Graphical User Interface (GUI) based on problem description.

[CO3] Identify the methods for solving critical problems over a GUI based IDE.

[CO4] Develop and debug applications using principles of OOP in Visual Programming.

[CO5] Develop programs that retrieve input from a file as opposed to input only provided by the user.



Department of Computer Science & Information Technology

Subject: Cyber Laws and Ethics

Code: BTE26145

3 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

[CO 1] Conduct a cyber security risk assessment

[CO 2] Measure the performance and troubleshoot cyber security systems.

[CO 3] Implement cyber security solutions.

[CO 4] Students able to use cyber security, information assurance, and cyber/computer forensics software/tools.

Subject: Computer Networking Lab

Code: BTE26151

2 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand the network simulator Packet Tracer.

[CO2] Create straight-through and cross over cables.

[CO3] Understand the structure and organization of computer networks; including the division into network layers, role of each layer, and relationships between the layers

[CO4] Understand the basic concepts of application layer protocol design; including client/server models, peer to peer models, and network naming.

Department of Computer Science & Information Technology

Subject: Compiler Design Lab

Code: BTE26150

2Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to

- [CO1] Understand and implement computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient analysis and design of computer-based systems of varying complexity
- [CO2] Apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success
- [CO3] Understand modern computer languages, environments, and platforms in creating innovative career paths, to be an entrepreneur, and a zest for higher studies.
- [CO4] Understand the target machine's run time environment, its instruction set for code generation and techniques used for code optimization

Subject: Advanced Java Programming Lab

Code: BTE26395

1 Credits | Semester VI

Course Outcomes: At the end of the course, students will be able to:

- [CO1] Understand the use of OOPs concepts.
- [CO2] Understand the use of abstraction.
- [CO3] Develop and implement exception handling, multithreaded applications with synchronization.
- [CO4] Understand the use of Collection Framework.
- [CO5] Design GUI based applications and develop applets for web applications.



Department of Computer Science & Information Technology

Semester VII



Department of Computer Science & Information Technology

Subject: Cryptography and Network Security

Code: BTE27182

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Acquire professional/academic knowledge and skills
- [CO2] Describe some common problems or attacks on network security
- [CO3] Describe some network security services and mechanisms
- [CO4] Analyze some cryptographic algorithms with their relation with real life.

Subject: Advanced Operating System

Code: BTE27334

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Comparatively analyse various operating systems
- [CO2] Express the challenges and its solutions in distributed operating system
- [CO3] Analyze the inter process communications and its challenges
- [CO4] Develop an understanding for clocks and time stamps in distributed environment

Department of Computer Science & Information Technology

Subject: Web and Internet

Code: BTE27335

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Formulate and create dynamic web documents and implement and execute program scripts.
- [CO2] Implement an appropriate planning strategy for developing websites
- [CO3] Locate, evaluate and critically assess current & emerging technologies for developing websites
- [CO4] Use current techniques, skills, and tools appropriate for immediate employment in computing technology

Subject: Quantum Computing

Code: BTE27336

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Understand and explain the basic notions of Quantum Computing-including Quantum Bits and registers, Quantum Evolution, Quantum Circuits, Quantum Teleportation and the basic Quantum Algorithms known at the present time.
- [CO2] Identify the essential difference between the classical paradigm and the quantum paradigm of computation and appreciate why quantum computers can solve currently intractable problems
- [CO3] Work with Quantum Simulator like Revkit 1.3, J Quantumetc to design and verify different quantum circuits.
- [CO4] Understand the classes of problems that can be expected to be solved well by quantum computers.



Department of Computer Science & Information Technology

Subject: Optimization Techniques

Code: BTE27337

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

[CO1] Cast engineering minima/maxima problems into optimization framework.

[CO2] Learn efficient computational procedures to solve optimization problems.

[CO3] Use Mat lab to implement important optimization methods

[CO4] Find the appropriate algorithm for allocation of resources to optimize the process of assignment.

Subject: Computer Graphics

Code: BTE27192

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

[CO1] Describe file structure of display & graphics file formats.

[CO2] Apply the algorithms to draw lines, circles and polygons.

[CO3] Use transformation techniques to scale, rotate and translate the object.

[CO4] Select the methods of enlarging visible portion of drawing

[CO5] Develop the logic for drawing the natural objects using different algorithms for curved lines



Department of Computer Science & Information Technology

Subject: Real Time Systems

Code: BTE27186

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Understand the use of multi-tasking techniques in real time systems.
- [CO2] Evaluate the performance of soft and hard real time systems.
- [CO3] Analyze multi task scheduling algorithms for periodic, aperiodic and sporadic tasks.
- [CO4] Analyse real time systems with regard to keeping time and resource restrictions.

Subject: Biology for Engineers

Code: BTE23018

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Understand the biological concepts from an engineering perspective
- [CO2] Understand the concepts of biological sensing and its challenges
- [CO3] Understand development of artificial systems mimicking human action
- [CO4] Integrate biological principles for developing next generation technologies



Department of Computer Science & Information Technology

Subject: Semantic Web and Social Networks

Code:

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand and knowledge representation for the semantic web

[CO2] Create ontology.

[CO3] Build a blogs and social networks.

[CO4] Analyze Social network performance

Subject: Data Analytics

Code: BTE27396

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

[CO1] Understand and demonstrate knowledge of programming terminology and how applied using Visual Programming.

[CO2] Illustrate and develop a Graphical User Interface (GUI) based on problem description.

[CO3] Identify the methods for solving critical problems over a GUI based IDE.

[CO4] Develop and debug applications using principles of OOP in Visual Programming.

[CO5] Develop programs that retrieve input from a file as opposed to input only provided by the user.



Department of Computer Science & Information Technology

Subject: Data Mining and Warehousing

Code: BTE25105

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Understand Data Warehouse fundamentals, Data Mining Principles
- [CO2] Design data warehouse with dimensional modelling and apply OLAP operations.
- [CO3] Identify appropriate data mining algorithms to solve real world problems.
- [CO4] Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining.
- [CO5] Describe complex data types with respect to spatial and web mining.

Subject: Electronic Design Automation

Code: BTE27192

3 Credits | Semester VII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Understand how to decompose large mapping problem into pieces, including the traditional decomposition for EDA.
- [CO2] Learn How to evaluate the quality of a design mapping and mapping approach
- [CO3] Identify Freedom that exists in design mappings and how that freedom can be exploited to reduce design costs
- [CO4] Understand the traditional design and cost functions from physical phenomena
- [CO5] Design & implement automation algorithms



Department of Computer Science & Information Technology

Semester VIII

Department of Computer Science & Information Technology

Subject: Cloud Computing

Code: BTE27194

3 Credits | Semester VIII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
- [CO2] Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS
- [CO3] Analyze various cloud programming models and apply them to solve problems on the cloud.
- [CO4] Discuss system, network and storage virtualization and outline their role in enabling the cloud computing system model.

Subject: Data Mining

Code: BTE25105

3 Credits | Semester VIII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Understand Data Warehouse fundamentals, Data Mining Principles
- [CO2] Design data warehouse with dimensional modelling and apply OLAP operations.
- [CO3] Identify appropriate data mining algorithms to solve real world problems.
- [CO4] Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining.
- [CO5] Describe complex data types with respect to spatial and web mining.



Department of Computer Science & Information Technology



Department of Computer Science & Information Technology

Subject: Advanced Computer Architecture

Code: BTE27190

3 Credits | Semester VIII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Understand the classes of computers, and new trends and developments in computer architecture
- [CO2] Understand pipelining, instruction set architectures, memory addressing.
- [CO3] Understand the performance metrics of microprocessors, memory, networks, and disks
- [CO4] Understand the various techniques to enhance a processors ability to exploit Instruction-level parallelism (ILP), and its challenges.

Subject: VLSI System Design

Code: BTE28362

3 Credits | Semester VIII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Design vlsi circuits starting from pmosnmos, cmos, and bicmos technology based design.
- [CO2] Understand the designing tools to draw layouts for the transistor structures
- [CO3] Analyze the design of logic gates
- [CO4] Understand the design of sequential systems



Department of Computer Science & Information Technology

Subject: Advanced Operating System

Code: BTE27334

3 Credits | Semester VIII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Understand the design issues of advanced operating systems and compare different types of operating systems.
- [CO2] Analyze design aspects and data structures used for different subsystems of Advanced OS.
- [CO3] Demonstrate understanding of different architectures used in Distributed OS and analyze their design issues.
- [CO4] Demonstrate understanding of different architectures used in Multiprocessor OS and their scheduling algorithms.
- [CO5] Classify Real Time OS and analyze various real time scheduling algorithms.

Subject: Cyber Security

Code: BTE28363

3 Credits | Semester VIII

Course Outcomes: At the end of the course, students will be able to

- [CO1] Understand cyber-attack, types of cybercrimes, cyber laws
- [CO2] Understand the technique to protect them self and ultimately society from such attacks
- [CO3] Design, develop, test and evaluate secure software.
- [CO4] Analyze and resolve security issues in networks and computer systems to secure an infrastructure.



Department of Computer Science & Information Technology

Subject: Soft Computing

Code: BTE28236

3 Credits | Semester VIII

Course Outcomes: At the end of the course, students will be able to

[CO1] Analyze and appreciate the applications which can use fuzzy logic.

[CO2] Understand the designing inference systems.

[CO3] Understand the difference between learning and programming and explore practical applications of Neural Networks (NN).

[CO4] Understand the importance of optimizations and its use in computer engineering fields and other domains

Signals and Systems

Code: BTE25294

4 Credits | Semester VIII

Course Outcomes: At the end of the course, students will be able to

[CO1] Recognize sampling theorem and its implications.

[CO2] Understand the concepts of continuous time and discrete time systems.

[CO3] Solve systems in complex frequency domain.

[CO4] Analyze the discrete time signals and system using different transform domain techniques.

[CO5] Evaluate the various signal responses.

[CO6] Design and implement LTI filters for filtering different real world signals.