

COURSE OUTCOMES(COs)

Course Code: BTES 301-18

Course Title: Digital Electronics

Course Outcomes:

CO1. Demonstrate the operation of simple digital gates, identify the symbols, develop the truth table for those gates; combine simple gates into more complex circuits; change binary, hexadecimal, octal numbers to their decimal equivalent and vice versa.

CO 2. Demonstrate the operation of a flip-flop. Design counters and clear the concept of shift registers.

CO3. Study different types of memories and their applications. Convert digital signal into analog and vice versa.

Course Code: BTCS301-18

Course Title: Data Structure & Algorithms

Course Outcomes:

CO1. For a given algorithm student will be able to analyze the algorithms to determine the time and computation complexity and justify the correctness;

CO2. Student will be able to handle operation like searching, insertion, deletion, traversing on various Data Structures and determine time and computational complexity;

CO3. Student will be able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity;

CO4. Students will be able to choose appropriate Data Structure as applied to specific problem definition

CO5. Demonstrate the reusability of Data Structures for implementing complex iterative problems.

Course Code: BTCS302-18

Course Title: Object Oriented Programming

Course Outcomes:

- CO1. Identify classes, objects, members of a class and the relationships among them needed to solve a specific problem;
- CO2. Demonstrate the concept of constructors and destructors. And create new definitions for some of the operators;
- CO3. Create function templates, overload function templates;
- CO4. Understand and demonstrate the concept of data encapsulation, inheritance, polymorphism with virtual functions; &
- CO5. Demonstrate the concept of file operations, streams in C++ and various I/O manipulators.

Course Code: BTCS303-18

Course Title: Data Structure & Algorithms Lab

Course Outcomes:

- CO1. Improve practical skills in designing and implementing basic linear data structure algorithms;
- CO2. Improve practical skills in designing and implementing Non-linear data structure algorithms;
- CO3. Use Linear and Non-Linear data structures to solve relevant problems;
- CO4. Choose appropriate Data Structure as applied to specific problem definition; &
- CO5. Implement Various searching algorithms and become familiar with their design methods.

Course Code: BTCS304-18

Course Title: Object Oriented Programming Lab

Course Outcomes:

- CO1. Develop classes incorporating object-oriented techniques;
- CO2. Design and implement object-oriented concepts of inheritance and polymorphism;
- CO3. Illustrate and implement STL class of containers and need for exceptions to handle errors for object-oriented programs

Course Code: BTAM304-18

Course Title: Mathematics-III

Course Outcomes:

- CO1. Understand the functions of several variables that are essential in most branches of engineering
- CO 2. Apply multiple integrals to deal with areas and volumes of various structures which are quite significant in real world
- CO3. Formulate and solve engineering problems related to convergence, infinite series, power series and Taylor series
- CO4. Create, select and utilize the learnt techniques of first degree ordinary differential equations to model real world problems
- CO 5. Be acquainted with the knowledge required to solve higher order ordinary differential equations.

Course Code: BTES 302-18

Course Title: Digital Electronics

Course Outcomes:

- CO1. Realize combinational circuits using logic gates.
- CO2. Realize sequential circuits using logic gates.
- CO3. Realize various types of Flip-flops and counters

Course Code: BTCS 401-18

Course Title: Discrete Mathematics

Course Outcomes:

CO1. To be able to express logical sentence in terms of predicates, quantifiers, and logical connectives

CO2. To derive the solution for a given problem using deductive logic and prove the solution based on logical inference

CO3. For a given a mathematical problem, classify its algebraic structure

CO4. To evaluate Boolean functions and simplify expressions using the properties of Boolean algebra

CO5. To develop the given problem as graph networks and solve with techniques of graph theory.

Course Code: BTES 401-18

Course Title: Computer Organization & Architecture

Course Outcomes:

CO1. Understand functional block diagram of microprocessor

CO2. Apply instruction set for Writing assembly language programs

CO3. Design a memory module and analyze its operation by interfacing with the CPU

CO4. Classify hardwired and microprogrammed control units

CO5. Understand the concept of pipelining and its performance metrics.

Course Code: BTCS 402-18

Course Title: Operating System

Course Outcomes:

CO1. Explain basic operating system concepts such as overall architecture, system calls, user mode and kernel mode;

CO2. Distinguish concepts related to processes, threads, process scheduling, race conditions and critical sections;

CO3. Analyze and apply CPU scheduling algorithms, deadlock detection and prevention algorithms;

CO4. Examine and categorize various memory management techniques like caching, paging, segmentation, virtual memory, and thrashing;

CO5. Design and implement file management system; &

CO6. Appraise high-level operating systems concepts such as file systems, disk-scheduling algorithms, and various file systems.

Course Code: BTCS 403-18

Course Title: Design & Analysis of Algorithm

Course Outcomes:

CO1. For a given algorithms analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms;

CO2. Explain when an algorithmic design situation calls for which design paradigm (greedy/ divide and conquer/backtrack etc.);

CO3. Explain model for a given engineering problem, using tree or graph, and write the corresponding algorithm to solve the problems;

CO4. Demonstrate the ways to analyze approximation/randomized algorithms (expected running time, probability of error); &

CO5. Examine the necessity for NP class-based problems and explain the use of heuristic techniques.

Course Code: BTCS 404-18

Course Title: Operating System Lab

Course Outcomes:

- CO1. Understand and implement basic services and functionalities of the operating system;
- CO2. Analyze and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority
- CO3. Implement commands for files and directories
- CO4. Understand and implement the concepts of shell programming
- CO5. Simulate file allocation and organization techniques
- CO6. Understand the concepts of deadlock in operating systems and implement them in multiprogramming system

Course Code: BTCS 405-18

Course Title: Design & Analysis of Algorithm Lab

Course Outcomes:

- CO1. Improve practical skills in designing and implementing complex problems with different techniques
- CO2. Understand comparative performance of strategies and hence choose appropriate, to apply to specific problem definition
- CO3. Implement Various tree and graph-based algorithms and become familiar with their design methods
- CO4. Design and Implement heuristics for real world problems.

Course Code: BTES 501-18

Course Title: Statistical Computing Techniques Using R

Course Outcomes:

CO1: To use a fundamental tool for computing in the practice of quantitative analytical methods (the ‘paper-and-pencil’ tool of the 21st century), that can work for the small jobs (like a pocket calculator) as well as for the big jobs (complex statistical data analysis).

CO2: Programming, data handling, transformations, subsetting, exploratory data analysis, probability distributions and simulations, regression and linear models, summarizing data, how to handle large data sets, effective graphics.

CO3: Modern concepts of statistics based on simulations and writing a report of a quantitative analysis.

Course Code: BTCS 501-18

Course Title: Database Management System

Course Outcomes:

CO1: write relational algebra expressions for a query and optimize the Developed expressions

CO2: design the databases using ER method and normalization.

CO3: construct the SQL queries for Open source and Commercial DBMS-MYSQL, ORACLE, and DB2.

CO4: determine the transaction atomicity, consistency, isolation, and durability.

CO5: Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.

Course Code: BTCS 502-18

Course Title: FLAT

Course Outcomes:

CO1: Write a formal notation for strings, languages and machines.

CO2: Design finite automata to accept a set of strings of a language.

CO3: Design context free grammars to generate strings of context free language.

CO4: Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars

CO5: Distinguish between computability and non-computability and Decidability and undecidability.

Course Code: BTAI ML 502-20

Course Title: Artificial Intelligence

Course Outcomes:

CO 1: Understand different types of AI agents.

CO 2: Develop different types of various AI search algorithms.

CO 3: Construct simple knowledge-based systems and to apply knowledge representation.

CO 4: Convert intermediate representation in contest to understand learning.

CO 5: Apply for various techniques for Expert Systems.

Course Code: BTAI ML 504-20

Course Title: Artificial Intelligence Lab

Course Outcomes:

CO 1 Explain artificial intelligence, its characteristics and its application areas

CO 2 Formulate real-world problems as state space problems, optimization problems or constraint satisfaction problems.

CO 3. Select and apply appropriate algorithms and AI techniques to solve complex problems.

CO 4. Design and develop an expert system by using appropriate tools and techniques.

Course Code: BTAI ML 501-20

Course Title: Programming in Python

Course Outcomes:

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

CO2: Demonstrate proficiency in handling Strings, Exceptions, and File Systems.

CO3: Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries.

CO4: Interpret the concepts of Object-Oriented Programming as used in Python.

CO5: Implement exemplary applications using date and time, generators, iterators, and collections in Python.

Course Code: BTAI ML 503-20

Course Title: Programming in Python Lab

Course Outcomes:

CO1: Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries.

CO2: Interpret the concepts of Object-Oriented Programming as used in Python.

CO3: Implement exemplary applications using date and time, generators, iterators, and collections in Python.

Course Code: BTAI ML 505-20

Course Title: Data Visualization Using Tableau

Course Outcomes:

- CO1 Infer the representation of tableau and its fields.
- CO2 Explore charts that are present in tableau.
- CO3 Apply the various charts used for data visualization
- CO4 Apply visualization tips in charts
- CO5 Learn to connect the Database to tableau and forecast the predictions.

Course Code: BTAI ML 509-20

Course Title: Java Programming

Course Outcomes:

- CO1: Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in OOP like encapsulation, Inheritance and Polymorphism
- CO2. Design and develop java programs, analyze, and interpret object-oriented data and report results.
- CO3. Design an object-oriented system, AWT components and multithreaded processes as per needs and specifications.
- CO4: Understand the database connectivity and design web-based applications on client server model
- CO5. Participate and succeed in competitive examinations like GATE, Engineering services, recruitment interviews etc.

Course Code: BTAI ML 510-20

Course Title: Java Programming Lab

Course Outcomes:

CO1: Use Java compiler and eclipse platform to write and execute java program.

CO2: Understand and Apply Object oriented features and Java concepts.

CO3: Apply the concept of multithreading and implement exception handling.

CO4: Access data from a Database with java program.

CO5: Develop applications using Console I/O and File I/O, GUI applications

Course Code: BTCS 504-18

Course Title: Computer Networks

Course Outcomes:

CO1: Explain the functions of the different layer of the OSI Protocol

CO2: Describe the function of each block of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)

CO3: Develop the network programming for a given problem related TCP/IP protocol

CO4: Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open-source available software and tools.

Course Code: BTCS 619-18

Course Title: Machine Learning

Course Outcomes:

CO1: Analyze methods and theories in the field of machine learning

CO2: Analyze and extract features of complex datasets

CO3: Deploy techniques to comment for the Regression

CO4: Comprehend and apply different classification and clustering techniques

CO5: Understand the concept of Neural Networks and Genetic Algorithm

Course Code: BTCS 507-18

Course Title: Computer Networks Lab

Course Outcomes:

CO1: Know about the various networking devices, tools and also understand the implementation of network topologies

CO2: Create various networking cables and know how to test these cables

CO3: Create and configure networks in packet trace rtool using various network devices and topologies

CO4: Understand IP addressing and configure networks using the subnet in;

CO5: Configure routers using various router configuration commands.

Course Code: BTAIML609-20

Course Title: Data Mining and Data Warehousing Lab

Course Outcomes:

CO1. Understand the various kinds of tools.

CO2. Demonstrate the classification, clustering and etc. in large data sets.

CO3. Ability to add mining algorithms as a component to the exiting tools.

CO4. Ability to apply mining techniques for realistic data.

Course Code: BTAIML601-20

Course Title: Graph Theory

Course Outcomes:

CO1 Know some important classes of graph theoretic problems.

CO2.Be able to formulate and prove central theorems about trees, matching, connectivity, coloring, and planar graphs.

CO3.Be able to describe and apply some basic algorithms for graphs.

CO4.Be able to use graph theory as a modelling tool.

Course Code: BTAIML602-20

Course Title: Graph Theory Lab

Course Outcomes:

CO1 Develop classes incorporating object-oriented techniques

CO 2. Design and implement object-oriented concepts of inheritance and polymorphism

CO3. Illustrate and implement STL class of containers and need for exceptions to handle errors for object-oriented programs

CO 4. Design and implement any real world-based problem involving GUI interface using object-oriented concepts.

Course Code: BTDS 603-20

Course Title: Big Data Analytics

Course Outcomes:

CO1. Describe Big Data and its importance with its applications

CO2. Differentiate various big data technologies like Hadoop MapReduce, Pig, Hive, Hbase and No-SQL.

CO 3. Apply tools and techniques to analyze Big Data.

CO4. Design a solution for a given problem using suitable Big Data Techniques

Course Code: BTDS 604-20

Course Title: Big Data Analytics Lab

Course Outcomes:

CO1: Perform data gathering of large data from a range of data sources.

CO2: Critically analyze existing Big Data datasets and implementations, taking practicality, and usefulness metrics into consideration.

CO3: Select and apply suitable statistical measures and analyses techniques for data of various structure and content and present summary statistics

CO4: Employ advanced statistical analytical skills to test assumptions, and to generate and present new information and insights from large datasets

Course Code: BTAIML603-20

Course Title: Neural Networks

Course Outcomes:

CO1 Understand the learning and generalization issue in neural computation.

CO2 Understand the basic ideas behind most common learning algorithms for multilayer perceptron's, radial-basis function networks, and Kohonen self-organizing maps.

CO3 Implement common learning algorithms using an existing package.

CO4 Apply neural networks to classification and recognition problems.

Course Code: BTAIML605-20

Course Title: Recommender System

Course Outcomes:

CO1 Understand the basic concepts of recommender systems.

CO2. Solve mathematical optimization problems pertaining to recommender systems.

CO3. Carry out performance evaluation of recommender systems based on various metrics.

CO 4. Implement machine-learning and data-mining algorithms in recommender systems data sets.

CO 5. Design and implement a simple recommender system.

Course Code: BTAIML606-20

Course Title: Recommender System Lab

Course Outcomes:

CO1. How to collect data and how to use it when you add a recommender system to your application.

CO2. Learn the difference between a recommendation and an advertisement, and between a personal recommendation and a non-personal one.

CO 3. Learn how to gather data to build your own recommender system.

CO 4. Learned about the ecosystem and infrastructure around recommender systems.

CO5. Learn how collaborative filtering is implemented in MovieGEEKs.

CO 6. Evaluating the effectiveness of a recommender algorithm.

CO7. Splitting data sets into training data and test data.

Course Code: BTAIML607-20

Course Title: Advance Computing and Network Technologies

Course Outcomes:

CO1: Understand the core concepts of the cloud computing paradigm. Analyze various cloud computing service and deployment models and apply them to solve problems on the cloud.

CO2: Understand advanced architectures of Cloud and their applications in FOG and Edge computing

CO3: Understand wireless network trends and build foundations for latest wireless and mobile networks

CO4: Explains the applications of ad hoc and wireless sensor networks and apply the knowledge to identify appropriate physical and MAC layer protocols.

Course Code: BTAIML608-20

Course Title: Advance Computing and Network Technologies Lab

Course Outcomes:

CO1: Identify major commercial projects in the field of cloud computing.

CO2: Build and implement Wireless Sensor Network.

CO3: Design IoT applications in different domain and be able to analyze their performance.

CO4: Implement basic IoT applications on embedded platform with cloud storage.

Course Code: BTCS601-18

Course Title: Compiler Design

Course Outcomes:

CO1: Build concepts on lexical analysis.

CO2: Understand strategies of syntax analysis.

CO3: Learn techniques of Intermediate code generation.

CO4: Understand code design issues and design code generator.

CO5: Design and develop optimized codes.