K.D.K. College of Engineering, Nagpur
Department of Computer Science & Engineering

Course Outcomes (2024-2025)	
Course Code	**Course Outcomes**
First Semester	
1BCS01T	**Applied Mathematics – I**
CO101.1	Apply the concept of different matrix operations, inversion.
CO101.2	Demonstrate Partial derivative of various function and apply their concepts for Engineering problems.
CO101.3	Apply the concepts of Beta and Gamma functions to solve the problems.
CO101.4	Solve ordinary differential equations using elementary techniques and apply it to formulate mathematical models.
CO101.5	Use higher order differential equations to solve the problems in engineering field.
1BCS02T	**Applied Chemistry**
CO102.1	Use basic principles of spectroscopy and its applications.
CO102.2	Apply concepts of electrochemistry for energy storage devices and corrosion.
CO102.3	Identify and describe different types of advanced engineering materials.
CO102.4	Develop an insight into concepts of Green Chemistry and e-waste management.
1BCS02P	**Applied Chemistry Lab**
CO102.1	Estimate the soluble impurities present in the given water sample.
CO102.2	Analyze a broad foundation in energy and environment that stresses scientific reasoning and analytical problem solving.
CO102.3	Point out & operate the different instruments used in chemistry laboratory.
1BCS03T	**Problem Solving using "C"**
CO103.1	Illustrate and explain the basic computer concepts and programming principles of C language.
CO103.2	Develop C programs to solve simple mathematical, decision-making problems and problems using looping constructs.
CO103.3	Develop C programs to demonstrate the applications of derived data types such as arrays, pointers, strings and functions.
CO103.4	Develop C programs to demonstrate the applications of derived data types such functions.
CO103.5	Develop C programs to demonstrate the applications of File Handling.
1BCS03P	**Program Solving using 'C' Lab**
CO103.1	Develop, Debug and Execute programs to demonstrate decision making and looping control structures in C.
CO103.2	Develop, Debug and Execute programs to demonstrate the applications of arrays in C.
CO103.3	Develop, Debug and Execute programs to demonstrate the applications of functions in C.
CO103.4	Develop, Debug and Execute programs to demonstrate the basic concepts of pointers in C.
1BCS04T	**Basics of Electronics Engineering**
CO104.1	Solve number system problems & analyze the concept of digital logic gates.
CO104.2	Analyze, Design & implement combinational circuits.

CO104.3	Analyze, Design & implement sequential circuits.
CO104.4	Compare the working of different electronic components.
CO104.5	Examine the communication devices and demonstrate the networking and wireless technology.
1BCS04P	**Basics of Electronics Engineering Lab**
CO104.1	Use the basic logic gates and test their use in combinational and sequential circuits
CO104.2	Apply knowledge of digital components and design logic circuits.
CO104.3	Illustrate the working mechanism and design of different combinational circuits in the digital system.
CO104.4	Apply knowledge of digital components and design logic circuits.
CO104.5	Demonstrate the knowledge of network commands and shall be able to design LAN network.
1BIK01T-A	**Indian Knowledge System**
COIK01T-A.1	Understand the diverse dimensions of Indian knowledge traditions.
COIK01T-A.2	Analyze the contributions of ancient Indian scholars to different fields of knowledge.
COIK01T-A.3	Explore the interconnectedness of various branches of Indian knowledge.
COIK01T-A.4	Critically evaluate the relevance of Indian knowledge systems in modern society.
1BCS05P	**Web Design Technology**
CO105.1	To design the structure and model of the HTML programming language
CO105.2	To apply CSS defining styles for web pages
CO105.3	Design dynamic web pages using Java script.
CO105.4	Create webpages using various tools.
1BCC01P-F	**Basics of Vedic Maths**
COCC01P-F.1	Compute simple arithmetic calculations with speed and accuracy
COCC01P-F.2	Generate tables of any number
COCC01P-F5.3	Solve products of large numbers quickly
COCC01P-F.4	Solve difficult calculations like square roots and cube roots of integers speedily.
Second Semester	
2BCS01T	**Applied Mathematics – II**
CO201.1	Analyze statistical data using curve fitting techniques.
CO201.2	Evaluate integrals using concepts of scalar and vector point function.
CO201.3	Use probability distributions and mathematical expectations to solve the problems.
CO201.4	Apply the various numerical methods to solve simultaneous equations.
CO201.5	Show the various concepts of vector spaces.
2BCS02T	**Engineering Physics**
CO202.1	Develop elementary concepts of quantum mechanics and their applications.
CO202.2	Relate the basic idea of total internal reflection to the propagation of light in an optical fibre and make use of the fibre concepts to solve numerical problems and relate to applications in Engineering.
CO202.3	Discriminate and explain different types of diodes, transistors, and their applications.
CO202.4	Analyze how to extend the basic concepts of motion of charged particles in electric magnetic fields to solve numerical problems and to relate to applications in electron optic devices and CRO.
CO202.5	Apply quantum transitions to the working of lasers.

2BCS02P	Engineering Physics Lab
CO202.1	Create the basic circuitries in Electronics. Demonstrate and illustrate the basic principles of operation of semiconductor diodes and transistors.
CO202.2	Differentiate between the types of semiconductors through band gap experiment. Analyze the magnetic field-based experiment to distinguish the materials.
CO202.3	Apply the concept of diffraction for the optical based devices using LASER beam. Develop the concept of fiber optic cables to determine the numerical aperture of the fiber cables and to get acquainted with its use in daily life.
CO202.4	Examine the various electrical and electronics-based parameters viz. A.C. Voltage, frequency, and phase shift and time period using CRO.
CO202.5	Practice effectively as an individual and as a member of a team.
2BCS03T	**Python Programming**
CO203.1	Analyze the core syntax and semantics of Python programming language.
CO203.2	Demonstrate the working of conditional statement.
CO203.3	Illustrate indexing and slicing to access arrays in Python programs.
CO204.4	Illustrate the use of exception handling in Python applications for error handling.
2BCS03P	**Python Programming Lab**
CO203.1	Students will understand the environment of Python Programming
CO203.2	Students will able to apply the operation on conditions using simple programs
CO203.3	Students will able to apply functions, modules and packages using python
CO203.4	Students will be able to implement various file operations using python and implement concepts of database connectivity
2BCS04T	**Computer Architecture & Organization**
CO204.1	Recognize basic functional blocks of computer and addressing modes.
CO204.2	Differentiate data in different instruction formats & design the concept of bus organization & Control Unit.
CO204.3	Solve arithmetic problems, Booths Algorithms and IEEE standard numerical.
CO204.4	Categorize data in different mapping functions & solve memory related problems.
CO204.5	Examine the use of pipelining and formulate efficiency of Pipelining.
2BAE01T-A	**Professional communication**
COAE01T-A.1	Acquire basic communication skill and correct grammar usage.
COAE01T-A.2	Understand formal written communication.
COAE01T-A.3	Organize and express their thoughts effectively through improving listening & speaking skills.
COAE01T-A.4	Learn oral communication skills in order to handle themselves effectively in interview and group discussion.
2BSE01P-A	**Linux & Shell Programming**
COSE01P-A.1	Understand LINUX architecture and LINUX commands.
COSE01P-A.2	Effectively used Linux environment using shell script.
COSE01P-A.3	Perform storage management and failure recovery through command.
COSE01P-A.4	Develop Shell Scripts for various operations.
2BCC01P-A	**Yoga/Sports Recreation**
COCC01P-A.1	Illustrate the fundamental techniques, underlying principles, and standard practices of both sports and yoga.
COCC01P-A.2	Collect practical experience in applying the principles of general and targeted physical conditioning exercises and yoga.

COCC01P-A.3	Enhance health-related fitness levels and achieve harmony between body and mind through participation in a variety of fitness activities, sports, recreational games, and yoga.
COCC01P-A.4	Practice Healthy & active living with reducing Sedentary Lifestyle.
Third Semester	
BECSE301T	**Applied Mathematics-III**
CO301.1	Understand numerical methods, matrices for the solution of linear and nonlinear equations, and the solution of differential equations, among other mathematical processes and activities.
CO301.2	Analyze real world scenarios to recognize when matrices and probability are appropriate, formulate problems about the scenarios, creatively model these scenarios(using technology, if appropriate) in order to solve the problems using multiple approaches.
CO301.3	Organize, manage and present data in a clear and concise manner.
CO301.4	Develop an ability to identify, formulate and / or solve real world problems.
CO301.5	Understand the impact of scientific and engineering solutions in a global and societal context.
BECSE302T	**Object Oriented Programming with Java**
CO302.1	Identify classes, objects, members of a class and relationships among them for a specific problem.
CO302.2	Understand and demonstrate the concepts of garbage collection, polymorphism, inheritance etc.
CO302.3	Get numeric(algebraic) and string-based computation.
CO302.4	Understand and implement modularity as well as basic error handling techniques.
CO302.5	Develop, design and implement small multithreaded programs using Java language.
BECSE303T	**Operating System**
CO303.1	Describe the important computer system resources and the role of operating system in their management policies and algorithms.
CO303.2	Understand the process management policies and scheduling of processes by CPU.
CO303.3	Describe and analyze the memory management and its allocation policies.
CO303.4	Evaluate the requirement for process synchronization and coordination handled by operating system.
CO303.5	Identify use and evaluate the storage management policies with respect to differentstorage management technologies and also understand the concept of Deadlock Prevention, Avoidance, Detection and Recovery.
BECSE304T	**Computer Architecture &Digital System**
CO304.1	Memorize and understand the basic concept of digital system which will be used to design the computer system.
CO304.2	Study and understand various instruction format used in computer design.
CO304.3	Study and understand the details working principle of basic processing unit.
CO304.4	Perform the arithmetic operation which is being used in the operation ofcomputer system.
CO304.5	Analyze and utilize OP-AMPs To understand variety of memory design system and different ways of communicating with I/O devices.
BECSE305T	**Ethics in IT**
CO305.1	Acquire knowledge about various roles of engineers in variety of global issuesand able to apply ethical principles to resolve situations that arise in their professional lives.
CO305.2	Articulate what makes a particular course of action ethically defensible
CO305.3	Identify the multiple ethical interests at stake in a real-world situation or practice.
CO305.4	Understand and apply Intellectual Property and related law in reality.
CO305.5	Understand the core values that shape the ethical behavior of an engineer / IT Professional.

BECSE306T	Universal Human Values
CO306.1	To become more aware of themselves, and their surroundings (family, society, nature)
CO306.2	To become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
CO306.3	They would have better critical ability.
CO306.4	To become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
BECSE307T	**Environmental Engineering (Audit Course)**
CO307.1	Identify different types of air pollutions as well as explain their causes, detrimental effectson environment and effective control measures.
CO307.2	Recognize various sources of water pollutants and interpret their causes.
CO307.3	Illustrate various types of pollutant waste management
CO307.4	Analyze various environmental social issues and challenges in implementation of environmental laws.
BECSE308P	**Object Oriented Programming with Java**
CO308.1	Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative executionmethods.
CO308.2	Use the Java SDK environment to create, debug and run simple Java programs.
CO308.3	Analyze the object-oriented paradigm using java programming language.
CO308.4	Implement small/medium scale java programs to resolve small business problems.
BECSE309P	**Operating System**
CO309.1	Practical implementation of Process concept, scheduling algorithms.
CO309.2	To implement demand paging using FIFO method, strings using LRU method.
CO309.3	Implementation of virtual memory management, producer and consumer processes using semaphore.
CO309.4	Apply knowledge for implementation of MVT (Multiprogramming with a Variable number of Tasks) and MFT (Multiprogramming with a fixed number of Tasks) memory management techniques.
BECSE310P	**Computer Workshop-1**
CO310.1	Get a fundamental understanding of Hyper Text Markup Language and apply the concepts of basic H.T.M.L code structure.
CO310.2	Implementation of list tag, marquee tag, href tag, frame tag, form tag and designing of small website using tags.
CO310.3	Designing the concepts for creation of H.T.M.L Table using Rows and Columns.
CO310.4	Describing Variables, Arrays, Operators and Conditional Statement using Java script.
Fourth Semester	
BECSE401T	**Discrete Mathematics & Graph Theory**
CO401.1	Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction.
CO401.2	Gain an introduction into how mathematical models for engineering are designed, analyzed and implemented in industry and organizations.
CO401.3	Reason mathematically about basic data types and structures (such as numbers, sets, graphs, and trees) used in computer algorithms and systems; distinguish rigorous definitions and conclusions from merely plausible ones.
CO401.4	Analyze real world scenarios to recognize when Logic, sets, functions are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches.
CO401.5	Apply knowledge of mathematics, physics and modern computing tools to scientific and engineering problems.

BECSE402T	Data Structures & Program Design
CO402.1	Analyze the complexity of algorithms and sorting techniques.
CO402.2	Apply the concept of stack and queues to solve real world problem.
CO402.3	Describe and implement linked list operation.
CO402.4	Demonstrate different methods for traversing trees.
CO402.5	Utilize the concepts of graphs to build solution. Design and implement searching techniques and hashing function
BECSE402P	**Data Structures & Program Design Lab**
CO402.1	Analyze the complexity of algorithms and sorting techniques.
CO402.2	Apply the concept of stack and queues to solve real world problem.
CO402.3	Describe and implement linked list operation.
CO402.4	Demonstrate different methods for traversing trees.
CO402.5	Utilize the concepts of graphs to build solution. Design and implement searching techniques and hashing function
BECSE403T	**Database Management System**
CO403.1	Understand basic database concepts and data modeling techniques used in database design.
CO403.2	Study the concept of functional dependency and perform the calculus with Design database by using different normalization technique.
CO403.3	Study query processing and Perform optimization on query processing.
CO403.4	Understand the concept of transaction processing and different recovery technique used in RDBMS.
CO403.5	Study and implement advanced databases which are used real time system.
BECSE403P	**Database Management System Lab**
CO403.1	Understand basic database concepts and data modeling techniques used in database design.
CO403.2	Study the concept of functional dependency and perform the calculus with Design database by using different normalization technique.
CO403.3	Study query processing and Perform optimization on query processing.
CO403.4	Understand the concept of transaction processing and different recovery technique used in RDBMS.
CO403.5	Study and implement advanced databases which are used real time system.
BECSE404T	**Computer Networks**
CO404.1	Describe the functions of each layer in OSI model along with basic networking concepts.
CO404.2	Explain physical layer functionality and it's working along with transmission media with real time applications.
CO404.3	Describe the functions of data link layer and explain the protocols used in data link layer.
CO404.4	Classify the routing protocols and analyze how to map IP addresses. Identify the issues related to transport layer, congestion control.
CO404.5	Describe Quality of Service, DNS, Application layer protocols & Network security issues.
BECSE405T	**Theory of Computation**
CO405.1	Design finite automata and its minimization along with Moore and Mealy machines.
CO405.2	Apply regular expression and create grammar for the same.
CO405.3	Deal with context free grammar and various normal forms of CFGs.
CO405.4	Create Push Down Automata for the given CFG and inter-conversion of the same.
CO405.5	Create Turning Machine for the grammar and Deal with Recursive and Recursively numerable Languages.

BECSE406T	System Programming
CO406.1	Identify the relevance of different system programs.
CO406.2	Describe the various data structures and passes of assembler design.
CO406.3	Identify the need for different features and designing of macros.
CO406.4	Distinguish different loaders and linkers and their contribution in developing efficient user applications.
CO406.5	Grab the concepts of phases of compiler, LEX and YACC.
BECSE407P	Computer Workshop-II
CO407.1	Declare python operators, numeric data types and string operations.
CO407.2	Implement tuple conditional blocks, loops in python
CO407.3	Apply functions, modules and packages using python.
CO407.4	Exception Handling and sorting algorithms and various data Structures
CO407.5	Implement various file operations using python and implement concept of object-oriented programming and python database connectivity.
Fifth Semester	
BTECH_CSE-501T	Artificial Intelligence
CO501.1	Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.
CO501.2	Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game- based techniques to solve them
CO501.3	To create an understanding of the basic issues of knowledge representation
CO501.4	Formulate and solve problems with uncertain information using Bayesian approaches.
CO501.5	Attain the capability to represent various real life problem domains using logic based techniques and BenQ
BTECH_CSE-501P	Artificial Intelligence
CO501.1	To demonstrate the knowledge of building blocks of AI as presented in terms of Intelligent Agents.
CO501.2	Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game - based techniques to solve them.
CO501.3	Create an understanding of basic issues of knowledge representation.
CO501.4	Formulate and solve the problem with uncertain information using Bayesian approaches.
CO501.5	Attain the capability to represent various real life problem domain using logic based techniques.
BTECH_CSE-502T	Design Analysis & Algorithms
CO502.1	Illustrate different approaches for analysis and design of efficient algorithms and Analyze performance of various algorithms using asymptotic notations
CO502.2	Determine and apply various divide & conquer strategies and greedy approaches for solving a given computational problem
CO502.3	Demonstrate and solve various real time problems using the concepts of dynamic programming
CO502.4	Make use of backtracking and graph traversal techniques for solving real-world problems
CO502.5	Recall and Classify the NP-hard and NP-complete problems
BTECH_CSE-502P	Design Analysis & Algorithms Lab
CO502.1	Calculate the time complexity of algorithm.
CO502.2	Sort the given numbers using various sorting algorithms.
CO502.3	Develop programs for the problems using Divide and Conquer and greedy methods.
CO502.4	Develop programs for the problems using Dynamic programming.
CO502.5	Able to write programs for the problems using Backtracking.

BTECH_CSE-503T	Software Engineering & Project Management
CO503.1	Understand software engineering methods, practices, process models and application
CO503.2	Analyze various software engineering life cycle models and apply methods for design and development of software projects
CO503.3	Analyze and extract requirements for product and translate these into documented design using different modelling techniques
CO503.4	Understand and apply software testing methods and types, also to understand debugging concept with various testing methods
CO503.5	Identify and apply the principles, processes and main knowledge areas for software project management.
BTECH_CSE-504.3T	**Elective-1: Data Warehousing & Mining**
CO504.3.1	Understand the basic concepts of Data Warehouse and data Mining techniques.
CO504.3.2	Capable to create a data warehouse and to process raw data.
CO504.3.3	Able to apply basic classification, clustering on a set of data
CO504.3.4	Able to identify frequent data items and to apply association rule on a set of data.
CO504.3.5	To learn recent trends of data mining such as web mining
BTECH_CSE-505P	**Professional Skills Lab-I**
CO505.1	List various tags in HTML, DHTML and use these, apply Cascaded style sheet to create web page.
CO505.2	Understand and evaluate web application architecture, technologies and Frameworks.
CO505.3	Apply the knowledge of web technology in developing web applications.
CO505.4	Develop an interactive web application using ASP.NET.
CO505.5	Evaluate different solutions in field of web application development.
BTECH_CSE-506T	**Effective Technical Communication**
CO506.1	Acquire knowledge of structure of language.
CO506.2	Able to face competitive exams and the interview process and can become employable
CO506.3	Develop business writing skills.
CO506.4	Become familiar with technology enabled c0mmunication and can develop technical and scientific writing skills.
CO506.5	Students have better reading comprehension, pronunciation, and functional English grammar.
BTECH_CSE-507T	**Yoga & Meditation (Audit Course)**
CO507.1	Learn the rules, fundamentals, skills & strategies of Yoga
CO507.2	Teach various asanas(postures)using hatha yoga & the Iyengar method
CO507.3	Learn breathing techniques
CO507.4	Improve strength, flexibility and the sense of well- being
CO507.5	Increase relaxation of body and soul
Sixth Semester	
BTECH_CSE-601T	**Compiler Design**
CO601.1	Define the Compiler along with phases and basic programs in LEX.
CO601.2	Develop programs for various kinds of the Parsers.
CO601.3	Write Simple programs related to Type Checking Parameter Passing and Overloading.
CO601.4	Implement the concepts of code Optimizations and Code Generations.
CO601.5	Provide the Case Studies of Object-Oriented Compilers

BTECH_CSE-601P	Compiler Design Lab
CO601.1	Generate scanner and parser from formal specification.
CO601.2	Generate top down and bottom-up parsing tables using Predictive parsing, SLR and LR Parsing Techniques
CO601.3	Apply the knowledge of YACC to syntax directed translations for generating intermediate code-3address code
CO601.4	Build a code generator using different intermediate codes and optimize the target code.
CO601.5	Generate scanner and parser from formal specification.
BTECH_CSE-602.3T	**Elective-II: Clustering & Cloud Computing**
CO602.3.1	Understand the different Cloud Computing environment.
CO602.3.2	Analyze virtualization technology and install virtualization software
CO602.3.3	Use appropriate data storage technique on Cloud, based on Cloud application
CO602.3.4	Apply security in cloud applications
CO602.3.5	Use advance techniques in Cloud Computing
BTECH_CSE-603.2T	**Elective-III: Distributed Operating Systems**
CO603.2.1	Learn the principles, architecture, algorithms and programming models used in distributed system.
CO603.2.2	Understand the core concepts of Distributed systems.
CO603.2.3	Design and implementation of sample distributed system, using different algorithm.
CO603.2.4	Understand the Distributed file system, Architecture and Mechanism.
CO603.2.5	Analyze the distributed scheduling, Issues in load distributing, Components of Load Distributing Algorithm.
BTECH_CSE-604.3T	**Open Elective 1: Block-Chain Technologies**
CO604.3.1	Understand the emerging abstract models for block chain technology.
CO604.3.2	Analyze the concept of crypto currency and mathematical background behind it.
CO604.3.3	Apply the tools for understanding the background of bitcoins.
CO604.3.4	Identify major research challenges and technical gaps existing between theory and practice in crypto currency domain.
CO604.3.5	Understanding of latest advances and its application in Block chain technology.
BTECH_CSE-605P	**Professional Skills Lab-II**
CO605.1	Understand the basic concepts of Python through small exercises.
CO605.2	Develop the fundamentals of ML knowledge representation, inference.
CO605.3	Apply the fundamentals of Supervised Learning in ML.
CO605.4	Apply the fundamentals of Un-Supervised Learning in ML.
CO605.5	Understand the basic concepts of Python through small exercises.
BTECH_CSE-606P	**Hardware Lab**
CO606.1	Identify various components of a system.
CO606.2	Assemble the computer
CO606.3	Use various Microsoft tools
CO606.4	To enhance the research activities in different application areas.
BTECH_CSE-607P	**Mini Project**
CO607.1	Acquire practical knowledge within the chosen area of technology. Analyze the area and find the requirement with systematic approach.
CO607.2	Contribute as an individual in a team to development technical projects.

CO607.3	Understand the paper writing skill in IEEE paper format and develop effective communication skills for presentation of project work.
CO607.4	Prepare a report on developed project.
BTECH_CSE-608T	**Economics of IT Industry**
CO608.1	Learn the different types of economics models with the concept of elasticity of demand and various factors of recession
CO608.2	Learn the concept of various intensive and digital economy with business cycles impact on economics.
CO608.3	Understand the Merger and Acquisition concept with the challenges of E-Waste management.
CO608.4	Adapt various funding source in economy with 5 level maturity model of IT industry.
BTECH_CSE-609T	**Intellectual Property Rights (Audit Course)**
CO609.1	Understand fundamental aspects of Intellectual property Rights
CO609.2	Apply knowledge on patents, patent regime in India and abroad and registration aspects
CO609.3	Capable of getting copyrights and its related rights and registration aspects
CO609.4	Capable of getting trademarks and registration aspects
CO609.5	Apply knowledge on Design, Geographical Indication (GI), Plant Variety and Layout Design
Seventh Semester	
BTECH_CSE-701T	**Cryptography and Network Security**
CO701.1	Acquire knowledge about security goals, background of cryptographic mathematics and identification of its application
CO701.2	Understand, analyze and implement – the symmetric key algorithm
CO701.3	Acquire knowledge about the background of mathematics of asymmetric key cryptography and understand and analyze – asymmetric key encryption algorithms, digital signatures
CO701.4	Analyze the concept of message integrity and the algorithms for checking the integrity of data.
CO701.5	Understand and analyze the existing cryptosystem used in networking.
BTECH_CSE-701P	**Cryptography and Network Security**
CO701.1	Acquire knowledge about security goals, background of cryptographic mathematics and identification of its application
CO701.2	Understand, analyze and implement – the symmetric key algorithm
CO701.3	Acquire knowledge about the background of mathematics of asymmetric key cryptography and understand and analyze – asymmetric key encryption algorithms, digital signatures
CO701.4	Analyze the concept of message integrity and the algorithms for checking the integrity of data.
BTECH_CSE-702T	**Elective-IV: Deep Learning**
CO702.1	Understand basic of deep learning algorithms.
CO702.2	Represent feedforward Neural Network
CO702.3	Evaluate the performance of different deep learning models with respect to the optimization, bias variance trade-off, overfitting and underfitting.
CO702.4	Apply the convolution networks in context with real world problem solving.
CO702.5	Apply recurrent neural networks in context with real world problem solving.
BTECH_CSE-703T	**Elective-V: Mobile Computing**
CO703.1	Understand the basic concepts of Wireless Communication with Cellular system.
CO703.2	Learn about GSM System with Cell layout, Radio, Network Switching and Operation subsystem, HLR & VLR.
CO703.3	Learn Wireless LAN with its Architecture and MAC Layer.
CO703.4	Learn Mobile IP, Dynamic Host Configuration Protocol, Mobile Ad hoc Networks.

CO703.5	Learn about TCP over Wireless Networks. with Wireless Application protocol.
BTECH_CSE-704T	**Open Elective II: Java Programming**
CO704.1	Understand the fundamentals of Java programming language and its application in software development.
CO704.2	Implement Java programming constructs such as variables, operators, control statements, loops, and arrays.
CO704.3	Design and implement object-oriented programs using inheritance, polymorphism, encapsulation, and abstraction concepts in Java.
CO704.4	Create and use classes, objects, and methods in Java programs.
CO704.5	Handle exceptions and use input/output techniques in Java programs.
BTECH_CSE-705T	**Project & Seminar**
CO705.1	Get a fundamental understanding of Cyber and Information Security and applying the concept of Information Security
CO705.2	Designing the concepts of conventional Encryption.
CO705.3	Analysis of various Algorithms and its efficiency.
CO705.4	Implementation of protection and security mechanisms using security tools.
BTECH_CSE-706T	**Research Methodology (Audit Course)**
CO706.1	Demonstrate the ability to choose methods appropriate to research aims and objectives.
CO706.2	Understand the limitations of particular research methods.
CO706.3	Develop skills in qualitative and quantitative data analysis and presentation.
CO706.4	Develop advanced critical thinking skills.
CO706.5	Demonstrate enhanced writing skills.
BTECH_CSE-801T	**Industry Project/Project**
CO801.1	Identify skills and capabilities that intersect effectively with the needs of industry.
CO801.2	Apply and practice good communication skills in the workplace setting.
CO801.3	Reflect and evaluate on experiences that might lead to future employment.
CO801.4	Report research findings in written and verbal forms.
CO801.5	Demonstrate and apply research skills to complete a project.
BTECH_CSE-802T	**GPU Architectures and Programming**
CO802.1	Understand conventional CPU architectures, their extensions for single instruction multiple data processing.
CO802.2	Program in CUDA about data space & synchronization.
CO802.3	Apply optimization on kernals, threads etc.
CO802.4	Learn basics of OpenCL.
CO802.5	Design an application using neural networks.
BTECH_CSE-803T	**Blockchain and its Applications**
CO803.1	Understand basic crypto primitives.
CO803.2	Understand elements and evolution of blockchain.
CO803.3	Understand consensus in permissionless and permissioned models.
CO803.4	Hands on Ethereum smart contracts and hyper ledgers
CO803.5	Perform decentralized identity management, interoperability.

Dr.A.A.Jaiswal
HOD-CSE