

**SOT- CSE- SEM-1**

<b>Course Code</b>	BTEC101	
<b>Course Name</b>	Basics of Electrical and Electronics	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand the basics of Electrical Engineering	Understand
<b>CO2</b>	Understand the applications of electrical components	Understand
<b>CO3</b>	Analyze the use and importance of electrical machines in industries	Analyse
<b>CO4</b>	Understand how industries are working with electrical machines	Understand
<b>CO5</b>	Apply test equipment's in electrical projects.	Apply

<b>Course Code</b>	BTMA103	
<b>Course Name</b>	Mathematics-I	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Apply the concepts of limits, continuity and derivatives to solving problems.	Apply
<b>CO2</b>	Determine convergence or divergence of sequences and series	Evaluate
<b>CO3</b>	Use Taylor and MacLaurin series to represent functions. Solve application problems	Apply
<b>CO4</b>	Understand functions of several variables, limits, continuity, partial derivatives. Identify and solve some system of linear equations.	Understand
<b>CO5</b>	To deal with functions of several variables that is essential in most branches of engineering. The essential tool of matrices and linear algebra in a comprehensive manner.	Analyse

<b>Course Code</b>	BTCS104	
<b>Course Name</b>	Computer Programming-I	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understanding of basic components of programming language	Understand
<b>CO2</b>	Understand any other programming language with the knowledge of array and string.	Understand
<b>CO3</b>	Apply function concepts in real time application.	Apply
<b>CO4</b>	Analyze working of structure in c or other programming language programs.	Analyse
<b>CO5</b>	Develop applications using C programming	Create

<b>Course Code</b>	BTPY105	
<b>Course Name</b>	Engineering Physics	
	<b>CO</b>	<b>BT</b>

<b>CO1</b>	Understanding of the basic knowledge of harmonic motions.	Understand
<b>CO2</b>	Conceptualization of different electric and magnetic properties of materials	Apply
<b>CO3</b>	Understanding different engineering applications of optical fundamentals.	Understand
<b>CO4</b>	Conceptualization of construction and working of lasers	Apply
<b>CO5</b>	To embrace the concept of the quantum physics and have basic understanding of its principles.	Analyse

<b>Course Code</b>	BTCS106	
<b>Course Name</b>	ICT Workshop	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand ,read and analyze as a definition for the manufacturing of a part.	Analyse
<b>CO2</b>	Apply to fabricate components with their own hands.	Apply
<b>CO3</b>	Apply the practical difficulties encountered in industries during any assembly work.	Apply
<b>CO4</b>	Develop the Practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.	Create
<b>CO5</b>	Develop small devices of their interest by assembling different components.	Create

<b>Course Code</b>	BTFS108	
<b>Course Name</b>	Fundamentals in Fire & Environment, Health, Safety	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand concept of industrial safety	Understand
<b>CO2</b>	Evaluate the risk by qualitative risk assessment	Evaluate
<b>CO3</b>	Understand environmental pollution and control measures	Understand
<b>CO4</b>	Understand principles of fire	Understand
<b>CO5</b>	Understand advanced firefighting system	Understand

<b>Course Code</b>	AECC101	
<b>Course Name</b>	Fundamentals of English	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	To emphasize the development of listening and reading skills among learners	Analyse
<b>CO2</b>	To equip them with writing skills needed for academic as well as workplace context	Apply
<b>CO3</b>	To enable learners of Engineering and Technology develop their basic communication skills in English	Understand
<b>CO4</b>	To strengthen the fundamentals in English Language.	Create

CO5	To build up the confidence to communicate with the world.	Create
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SOT- CSE- SEM-2	

<b>Course Code</b>	BTCS201	
<b>Course Name</b>	Object Oriented Programming with C++	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand object-oriented programming features in C++.	Understand
<b>CO2</b>	Implement computer programs to solve real world problems based on object-oriented principles	Apply
<b>CO3</b>		Understand
<b>CO4</b>	Analyze concept of inheritance and exception handling	Analyse
<b>CO5</b>	Develop the applications using object oriented programming with C++	Create

<b>Course Code</b>	BTCS202	
<b>Course Name</b>	Data Structures & Algorithms	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand and use the process of abstraction using a programming language such as' C++.	Understand
<b>CO2</b>	Analyze step by step and develop algorithms to solve real world	Analyse
<b>CO3</b>	Implementing various data structures viz. Stacks, Queues, Linked Lists,	Apply
<b>CO4</b>	Understanding various searching & sorting techniques.	Understand
<b>CO5</b>	Identify the appropriate data structure to design efficient algorithm for	Analyse

<b>Course Code</b>	BTCS203	
<b>Course Name</b>	Web Technologies	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand the importance and need of client side scripting	Understand
<b>CO2</b>	Analyze and Develop static and dynamic web applications.	Create
<b>CO3</b>	Develop responsive websites	Create
<b>CO4</b>	Apply the jquery to enhance the creative web page.	Apply
<b>CO5</b>	Apply Bootstrap in real time web application development.	Apply

<b>Course Code</b>	BTCS204	
<b>Course Name</b>	Mathematics - II	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	understand the terminologies of basic probability, two types of random variables and their probability functions observe and analyze the behavior of various discrete and continuous probability distributions	Understand
<b>CO2</b>	understand the central tendency, correlation and correlation coefficient and also regression	Apply
<b>CO3</b>	apply the statistics for testing the significance of the given large and small sample data and use time series analysis for predictions	Analyse

<b>Course Code</b>	BTCS205	
<b>Course Name</b>	Digital Electronics	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand the number system	Understand
<b>CO2</b>	Apply Boolean algebra for K-maps	Apply
<b>CO3</b>	Analyze combinational circuits	Analyze
<b>CO4</b>	Understand working of sequential circuits.	Understand
<b>CO5</b>	Comprehend understanding of memory structure	Understand

<b>Course Code</b>	AECC201	
<b>Course Name</b>	Communication Skills in English	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	To enable learners develop their basic communication skills in English.	Understand
<b>CO2</b>	To equip them with writing skills needed for academic as well as workplace context.	Evaluate
<b>CO3</b>	To prepare students for professional communication at world level.	Apply
<b>CO4</b>	To develop corporate communicational attitude.	Create
<b>CO5</b>	To strengthen digital communication using technological modules and expertise.	Apply

### SOT- CSE- SEM-3

<b>Course Code</b>	BTCS301	
<b>Course Name</b>	Discrete Mathematics	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand the concept of sets	Understand
<b>CO2</b>	Analyze use of propositional theory in real time scenario	Analyse
<b>CO3</b>	Apply recurrence relations in other applications	Apply
<b>CO4</b>	Apply generation of functions in algebraic structures.	Apply
<b>CO5</b>	Comprehend the use of graph theory in other domains	Evaluate

<b>Course Code</b>	BTCS302	
<b>Course Name</b>	Object Oriented Programming with JAVA	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand basic java programming	Understand
<b>CO2</b>	Analyze how inbuilt functions are working	Analyze
<b>CO3</b>	Comprehend use of inheritance in real time applications.	Understand
<b>CO4</b>	Develop and handle GUI based applications	Create
<b>CO5</b>	Apply network programming with java based applications	Create

<b>Course Code</b>	BTCS303	
<b>Course Name</b>	Operating System	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand the basics of an operating systems and its major components	Understand
<b>CO2</b>	Implementation of shell programming	Apply
<b>CO3</b>	Create and/or modify concurrent programs	Create
<b>CO4</b>	Demonstrate competence in recognizing and using operating system features	Apply
<b>CO5</b>	Comprehend the mechanism of operating Systems to handle processes, memory and file management	Evaluate

<b>Course Code</b>	BTCS304	
<b>Course Name</b>	Computer Organization	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand how fetch-decode and execute cycle works.	Understand
<b>CO2</b>	Analyze inside mechanism of computer	Analyze
<b>CO3</b>	Apply different information representation in intermediate code	Apply
<b>CO4</b>	Able to Evaluate and Manage memory for different purposes.	Evaluate
<b>CO5</b>	Comprehend input output organization of computer with different storage devices,	Apply

<b>Course Code</b>	BTCS305	
<b>Course Name</b>	Specialized Track Elective-I-Python Programming	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand the basics of python programming	Understand
<b>CO2</b>	Understand the concepts of loops and control structures for different purposes.	Understand
<b>CO3</b>	Comprehend about working of list and dictionaries	Analyse
<b>CO4</b>	Design python application with the use of date-time and other functions.	Create
<b>CO5</b>	Apply in development of real time applications of IOT	Apply

<b>Course Code</b>	AECC301	
<b>Course Name</b>	Entrepreneurship Development	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Develop skills for evaluating, articulating, refining, and pitching a	Understand
<b>CO2</b>	Analyze the elements of success of entrepreneurial ventures.	Analyse
<b>CO3</b>	Analyze Feasibility of the project (Financial and Non-Financial) and	Analyse
<b>CO4</b>	Develop present successful work, collaboration and division of tasks	Create
<b>CO5</b>	understand the application of the tools necessary to create	Understand

### SOT- CSE- SEM-4

<b>Course Code</b>	BTCS401	
<b>Course Name</b>	Numerical Methods in Computer Science & Engineering	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Organize & present quantitative data and think critically with respect to quantitative information characterized by the centre, spread, and skewness of data.	Understand
<b>CO2</b>	Develop the concept of a sampling distribution and infer some characteristics of a population by examining a portion of the population and to make informed decision in a probabilistic environment	Create
<b>CO3</b>	Express quantitatively the degree and direction of association between two linearly related variables and fit a regression model to the data as well as investigating the explained portion	Evaluate
<b>CO4</b>	Understand optimization problems particularly constrained linear models	Understand
<b>CO5</b>	Apply knowledge of linear programming in real scenarios	Apply

<b>Course Code</b>	BTCS402	
<b>Course Name</b>	Computer Networks	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Analyze any network configuration	Analyse
<b>CO2</b>	Understand TCP/IP protocol for different layers	Understand
<b>CO3</b>	Understand the network traffic and their communication	Apply
<b>CO4</b>	Comprehend the working of transport layer	Understand
<b>CO5</b>	Apply security encryption aspects in different technologies	Apply

<b>Course Code</b>	BTCS403	
<b>Course Name</b>	Microprocessor & Interfacing	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand working of each components in microprocessor	Understand
<b>CO2</b>	Comprehend architecture of 8085 with its instruction and addressing formats	Understand
<b>CO3</b>	Write assemble code and understand the working of 8255A	Apply
<b>CO4</b>	8085	Analyze
<b>CO5</b>	Apply the knowledge regarding ARM processor in real time applications	Apply

<b>Course Code</b>	BTCS404	
<b>Course Name</b>	Database Management Systems	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand various aspects of the relational database like models, functional dependencies and normalization	Understand
<b>CO2</b>	Design databases for various scenarios	Create
<b>CO3</b>	Interpret transaction processing, concurrency and recovery protocols for effective database management	Apply
<b>CO4</b>	Design database with all necessary constraints	Create
<b>CO5</b>	Evaluate various storage and retrieval methods to correlate with relational model through appropriate indexing	Evaluate



<b>Course Code</b>	BTCS405	
<b>Course Name</b>	Specialized Track Elective -I - Fundamentals of AI & ML	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand basic concepts for AI	Understand
<b>CO2</b>	Analyze use of machine learning in real-time applications	Analyze
<b>CO3</b>	Develop critical thinking skills to evaluate the performance and limitations of different AI techniques and algorithms.	create
<b>CO4</b>	Understanding the different types of machine learning algorithms, such as supervised, unsupervised, and reinforcement learning.	Understand
<b>CO5</b>	Implement real time application with AI and Machine Learning.	Apply

<b>Course Code</b>	BTCS406	
<b>Course Name</b>	Specialized Track Elective-II - Fundamentals of IoT	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand basics of IOT	Understand
<b>CO2</b>	Understand basics of hardware components and its configurations	Understand
<b>CO3</b>	Provide brief idea about protocols used for IOT device communication.	Understand
<b>CO4</b>	Elaborate understanding of remote data monitoring	Evaluate
<b>CO5</b>	Implement real time application with IoT	Apply

<b>Course Code</b>	BTCS407	
<b>Course Name</b>	Specialized Track Elective-III - Fundamentals of Cyber Security	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Students will understand fundamentals of cyber security	Understand
<b>CO2</b>	Students will learn about risk, policies and procedures related to cyber security	Remember
<b>CO3</b>	Students will learn about security architecture	Understand
<b>CO4</b>	Students will learn about secure systems and network	Remember
<b>CO5</b>	Students will learn about security implications.	Analyse

<b>Course Code</b>	AECC401	
<b>Course Name</b>	Environmental Studies	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Remember terminologies of environmental studies	Remember
<b>CO2</b>	Understand concept of ecosystem & its interaction in environment	Understand
<b>CO3</b>	Understand use of renewable and nonrenewable energy in environment	Understand
<b>CO4</b>	Edebate environmental science with use of appropriate scientific	Understand
<b>CO5</b>	Understand environmental laws & regulations	Understand

## SOT- CSE- SEM-5

<b>Course Code</b>	BTCS501	
<b>Course Name</b>	Design and Analysis of Algorithms	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand notion of algorithmic complexity and logic of fundamental algorithm	Understand
<b>CO1</b>	Apply fundamental algorithms in real life problem solving	Apply
<b>CO3</b>	Evaluate suitable algorithmic strategies to solve a problem effectively and efficiently	Evaluate
<b>CO4</b>	Evaluate different algorithms with respect to time and space complexity	Evaluate
<b>CO5</b>	Create algorithms to solve various computational problems	Create

<b>Course Code</b>	BTCS502	
<b>Course Name</b>	Software Engineering	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand SRS (Software Requirement Specification)	Understand
<b>CO2</b>	Apply the concept of Functional Oriented and Object Oriented Approach	Apply
<b>CO3</b>	Understand and Recognize how to ensure the quality of software product.	Understand
<b>CO4</b>	Apply various testing techniques and test plan.	Apply
<b>CO5</b>	Analyze the modern Agile Development for the Concept of Industry.	Analyze

<b>Course Code</b>	BTCS503	
<b>Course Name</b>	Advanced Web Technologies	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Apply the concept of php and ajax	Apply
<b>CO2</b>	Develop web applications using AngularJs	Create
<b>CO3</b>	Design and develop interactive web applications using NodeJs	Create
<b>CO4</b>	Connect MongoDB with realtime web applications.	Apply
<b>CO5</b>	Develop real time applications through the Django framework.	Create

<b>Course Code</b>	BTCS504	
<b>Course Name</b>	Specialized Track Elective-I -Data Science for Engineers	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand and manipulate basic of python and data structure	Understand
<b>CO2</b>	Implement various data preprocessing techniques	Apply
<b>CO3</b>	Visualize the real time data	Analyse
<b>CO4</b>	Able to wrangle the data.	Evaluate
<b>CO5</b>	Able to do statistical analysis.	Analyse

<b>Course Code</b>	BTCS505
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<b>Course Name</b>	Specialized Track Elective- II - IoT Architecture and Protocols	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Explore the interconnection and integration of various machines.	Remember
<b>CO2</b>	Ability to design and develop IOT Devices.	Create
<b>CO3</b>	Understand the application protocols of IOT .	Understand
<b>CO4</b>	Implement and connect the IoT devices with AWS Cloud	Apply
<b>CO5</b>	Apply the knowledge of IoT in various real time projects as case study..	Apply

<b>Course Code</b>	BTCS507	
<b>Course Name</b>	Specialized Track Elective -III -Network security and access control	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Discuss major issues concerning network security.	Understand
<b>CO2</b>	Understand risk involved in access control	Understand
<b>CO3</b>	Explore different Procedure, and Guidelines for access control policies	Analyse
<b>CO4</b>	Implement the access control system	Apply
<b>CO5</b>	Implementation of access control system for information system	Apply

<b>Course Code</b>	AECC502	
<b>Course Name</b>	Business Communication (2019) / Disaster Risk Management (2020)	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Remember terminologies and concept of disasters	Remember
<b>CO2</b>	Understand framework and concept of disaster management cycle	Understand
<b>CO3</b>	Understand guidelines and policies of disaster management in India	Understand
<b>CO4</b>	Understand role of science and technology in disaster management	Understand

## SOT- CSE- SEM-6

<b>Course Code</b>	BTCS602	
<b>Course Name</b>	Theory of Computation	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand formal language theory and its application to computer science	Understand
<b>CO2</b>	Understand properties of the corresponding language classes defined by various computation models and the relations between them	Understand
<b>CO3</b>	Apply mathematical preliminaries to develop the basic components of language design	Apply
<b>CO4</b>	Evaluate computer science problems as mathematical statements and to formulate proofs	Evaluate
<b>CO5</b>	Design simple computational machines using the concepts of language theory	Create

<b>Course Code</b>	BTCS603	
<b>Course Name</b>	Advanced Java Technology	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Use and understand advanced technology in Java such as Internationalization, and Remote method Invocation	Create
<b>CO2</b>	Learn and understand how to work with JavaBeans	Understand
<b>CO3</b>	Develop web application using Java Servlet and Java Server Pages technology	Create
<b>CO4</b>	Apply event handling on AWT and Swing components	apply
<b>CO5</b>	Learn and implement programs on advanced topics including multithreading, internet networking, and JDBC database connectivity	Create

<b>Course Code</b>	BTCS604	
<b>Course Name</b>	Specialized Track Elective I -Deep Learning	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	1. Understanding the history of artificial intelligence (AI) and its	Understand
<b>CO2</b>	2. Apply basic principles of AI in solutions that require problem solving,	Apply
<b>CO3</b>	3. Analyze and evaluate various deep learning models.	Analyse
<b>CO4</b>	4. Develop applications in an 'AI language', expert system shell, or data mining tool.	Create
<b>CO5</b>	5. Implement deep learning algorithms and solve real-world problems	Apply

<b>Course Code</b>	BTCS605	
<b>Course Name</b>	Specialized Track Elective-II - IoT Network, Signal & Signal processing	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand about the various types of signals and its processing techniques.	Understand
<b>CO2</b>	Acquire knowledge of signal conditioning.	Understand

<b>CO3</b>	Evaluate about the processing of digital signal.	Evaluate
<b>CO4</b>	Analyze the knowledge of digital signal transmission.	Analyse
<b>CO5</b>	Apply the knowledge for protocol conversion.	Apply

<b>Course Code</b>	BTCS606	
<b>Course Name</b>	Specialized Track Elective-I -Big Data Architecture and Programming	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Explain the motivation for big data systems and identify the main sources of Big Data in the real world	Understand
<b>CO2</b>	Demonstrate an ability to use frameworks like Hadoop, NOSQL to efficiently store, retrieve and process Big Data for Analytics.	Analyse
<b>CO3</b>	Implement several Data Intensive tasks using the Map Reduce Paradigm	Apply
<b>CO4</b>	and finding associations in Big Data .	Apply
<b>CO5</b>	Graphs and Social Media data.	Create

<b>Course Code</b>	BTCS607	
<b>Course Name</b>	Specialized Track Elective-II - Data Analytics for IoT	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand the basic concepts of big data analytics.	Understand
<b>CO2</b>	Analyze different applications Internet of things.	Analyse
<b>CO3</b>	Familiarity with data analytics tools and techniques	Understand
<b>CO4</b>	Ability to collect and analyze IoT data	Apply
<b>CO5</b>	Creating the IoT based applications using big data platforms	Create

<b>Course Code</b>	BTCS608	
<b>Course Name</b>	Specialized Track Elctive-III - Platform & Application security principles	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Describe web-based applications and associated threats and differentiate	Understand
<b>CO2</b>	Understand secure system design Devescops and implement	Apply
<b>CO3</b>	Minimizing risks by combining application security testing tools	Apply
<b>CO4</b>	Identify the vulnerabilities in the web applications	Analyse
<b>CO5</b>	Deploy and understand system security principle	Create

<b>Course Code</b>	BTCS609	
<b>Course Name</b>	Specialized Track Elctive -III - Wireless and Mobile Device security	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Comprehend the fundamental concepts of mobile and wireless network	Understand
<b>CO2</b>	Identify security threats in wireless networks and design strategies to	Create
<b>CO3</b>	Design secured network application considering all possible threats	Create

<b>Course Code</b>	BTCS601	
<b>Course Name</b>	Indian Constitution	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand importance of Indian constitution	Understand
<b>CO2</b>	Understand powers of state and union government	Understand
<b>CO3</b>	Understand administration of Indian Constitution	Remember

<b>Course Code</b>	BTCS601A	
<b>Course Name</b>	Cyber Security	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand fundamental blocks of Cyber security	Understand
<b>CO2</b>	Analyze security threats and vulnerabilities	Analyze
<b>CO3</b>	Analyze network security	Analyze
<b>CO4</b>	Comprehend system and application security	Understand
<b>CO5</b>	learn and understand blockchain technology	-

<b>Course Code</b>	BTCS601B	
<b>Course Name</b>	Dot Net Technology	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand the existing fundamental blocks of C# codes.	Understand
<b>CO2</b>	Develop the console and GUI applications using C# .Net.	Create
<b>CO3</b>	Create the dynamic web page using ASP.NET Controls which interact with	Apply
<b>CO4</b>	Comprehend the advanced concepts of .NET Programming while preparing	Apply
<b>CO5</b>	Analyze security aspect of an application.	Analyse

<b>Course Code</b>	BTCS601C	
<b>Course Name</b>	Digital Image Processing	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Analyze general terminology of digital image processing.	Understand
<b>CO2</b>	Examine various types of images, intensity transformations and spatial	Analyze
<b>CO3</b>	Develop Fourier transform for image processing in frequency domain.	Create
<b>CO4</b>	Evaluate the methodologies for image segmentation, restoration etc	Evaluate
<b>CO5</b>	Implement image process and analysis algorithms.	Apply

<b>Course Code</b>	BTCS601D	
<b>Course Name</b>	R Programming	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand basics of R programming.	Understand
<b>CO2</b>	Understand the process of data preparation.	Understand
<b>CO3</b>	Evaluate the data and prepare it for analysis	Evaluate
<b>CO4</b>	Analyze a data set in R and present findings using the appropriate R packages	Analyse
<b>CO5</b>	Apply various concepts to write programs in R	Apply

<b>Course Code</b>	BTCS601E	
<b>Course Name</b>	Concepts of AR / VR	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	To analyse the hardware and software requirements.	Analyze
<b>CO2</b>	To use the different intersection techniques.	Apply
<b>CO3</b>	To design 3D interfaces.	Apply
<b>CO4</b>	Learn the fundamental aspects of designing and implementing using VR.	Understand
<b>CO5</b>	Learn about multimodal virtual displays for conveying the techniques for evaluating virtual interfaces	Evaluate

### SOT- CSE- SEM-7

<b>Course Code</b>	BTCS702	
<b>Course Name</b>	Mobile Application Development	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understanding algorithm/protocols, environments and communication systems in mobile computing	Understand
<b>CO2</b>	Evaluate the performance of GSM, GPRS and other technologies	Evaluate
<b>CO3</b>	Apply methods in storing, sharing and retrieving data in Android applications	Apply
<b>CO4</b>	Implement different Android applications	Create
<b>CO5</b>	Implement IOS applications	Create

<b>Course Code</b>	BTCS703	
<b>Course Name</b>	Specialized Track Elective- I -Natural Language Processing	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	1. Understand and comprehend the key concepts of NLP and identify NLP challenges and issues	Understand
<b>CO2</b>	2. Develop language modelling for various text across the different languages	Create
<b>CO3</b>	3. Apply computational methods to understand language phenomena of word sense disambiguation	Apply
<b>CO4</b>	4. Design and develop applications for text or information extraction and classification	Create
<b>CO5</b>	5. Apply different Machine translation techniques for translating a source to target languages	Apply

<b>Course Code</b>	BTCS705	
<b>Course Name</b>	Specialized Track Elective- I Machine Learning for Intelligent	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	1. Understand the concepts of Instance Based Learning And Bayesian Learning	Understand
<b>CO2</b>	2. Apply the Machine learning algorithms on IOT problems.	Apply
<b>CO3</b>	3. Analyse and Apply ML Applications to Computer Vision	Analyse
<b>CO4</b>	4. Apply ML Applications to Sentiment Analysis	Apply
<b>CO5</b>	5. Analyse the use of ML in applications like Bots	Analyse

<b>Course Code</b>	BTCS707	
<b>Course Name</b>	Specialized Track Elective III - Vulnerability & Risk Management	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand risk and vulnerability in the context of energy production, environmental disaster to commercial management projects.	Understand



<b>CO2</b>	Analyse risk assessment and mitigation strategies in specific situations.	Analyze
<b>CO3</b>	Understand risk transference and vulnerability driven management decisions.	Understand
<b>CO4</b>	Implement and monitor appropriate management techniques relevant to specific situations.	Apply
<b>CO5</b>	Understand the shortfalls of many vulnerability assessment programs	Understand

<b>Course Code</b>	BTCS708	
<b>Course Name</b>	Specialized Track Elective-III - Digital forensic, investigation and	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Acquire knowledge of various digital forensic tools	Understand
<b>CO2</b>	Interpret security issues in the Information Communication Technology (ICT) world, and apply digital forensic tools for security and investigations	Understand
<b>CO3</b>	Achieve adequate perspectives of digital forensic investigation in various applications /devices like Windows/Unix system, mobile, email etc	Apply
<b>CO4</b>	Generate legal evidence and supporting investigation reports.	Create

<b>Course Code</b>	BTCS704	
<b>Course Name</b>	Specialized Track Elective-II - Fundamentals of Robotics &	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Acquiring the basics knowledge robotics .	Remember
<b>CO2</b>	Provide a brief understanding of drive systems and end effectors	Understand
<b>CO3</b>	Acquire knowledge about sensors and machine	Understand
<b>CO4</b>	Provide practical experience in robotic programming	Apply
<b>CO5</b>	Analyse the process for creating bot.	Analyse

<b>Course Code</b>	BTCS706	
<b>Course Name</b>	Specialized Track Elective -II - Industry 4.0 and Application Areas	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand the basic concepts of Industry 4.0	Remember
<b>CO2</b>	Learn Design thinking principles and its usage.	Understand
<b>CO3</b>	Develop the skills to use Visualization software	Apply
<b>CO4</b>	Understand how industry 4.0 works and product development.	Understand
<b>CO5</b>	Understand a deep insight into how intelligent processes, big data, and artificial intelligence can be used to build up the production of the future	Apply

<b>Course Code</b>	BTCS701A
<b>Course Name</b>	Service Oriented Architecture

	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Able to design, develop and test Web services.	Analyse
<b>CO2</b>	Learn standards related to Web services: Web Services Description Language (WSDL), Simple Object Access Protocol (SOAP), and Universal Description, Discovery and Integration (UDDI).	Understand
<b>CO3</b>	Conceptually model Web services and formulate specifications of them in the Resource Description Framework (RDF) and the Web Ontology Language (OWL).	Create
<b>CO4</b>	Learn approaches to compose services	Remember
<b>CO5</b>	Evaluate emerging and proposed standards for the main components of Web services architectures.	Analyse

<b>Course Code</b>	BTCS701B	
<b>Course Name</b>	Compiler Construction	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Identify appropriate optimization technique for compilation process	Understand
<b>CO2</b>	Apply automata theory and knowledge on formal languages	Apply
<b>CO3</b>	Apply language theory concepts to various phases of compiler design	Apply
<b>CO4</b>	Understand backend of compiler: intermediate code, Code optimization	Understand
<b>CO5</b>	Techniques and Error Recovery mechanisms	Create

<b>Course Code</b>	BTCS701C	
<b>Course Name</b>	Distributed Computing Systems	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Understand the fundamental concepts and principles of distributed systems	Understand
<b>CO2</b>	Apply various distributed algorithms related to clock synchronization, con currency control, deadlock detection, load balancing, voting etc.	Apply
<b>CO3</b>	Analyze fault tolerance and recovery in distributed systems and algorithms for the same.	Analyze
<b>CO4</b>	Analyze the design and functioning of existing distributed systems and file systems	Analyze
<b>CO5</b>	Devlop different distributed algorithms over current distributed plat forms	create

<b>Course Code</b>	BTCS701D	
<b>Course Name</b>	Soft Computing	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	Apply various soft computing concepts for practical applications.	Apply

<b>CO2</b>	Use fuzzy rules and reasoning to develop decision making and an expert system	Understand
<b>CO3</b>	Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems, genetic algorithms to combinatorial optimization problems and neural networks to pattern classification and regression problems.	Apply
<b>CO4</b>	Explain the importance of optimization techniques and genetic programming.	Understand
<b>CO5</b>	Review the various hybrid soft computing techniques and apply in real time problems	Analyse

<b>Course Code</b>	BTCS701E	
<b>Course Name</b>	Computer Vision	
	<b>CO</b>	<b>BT</b>
<b>CO1</b>	To implement fundamental image processing techniques required for computer vision	Apply
<b>CO2</b>	To Implement the shape Analysis	Apply
<b>CO3</b>	To develop applications using computer vision techniques	Create
<b>CO4</b>	Extract features form Images and do analysis of Images	Create
<b>CO5</b>	Understand video processing, motion computation and 3D vision and geometry	Understand