Shree Santkrupa Institute of Engineering and Technology

Department of Computer Science and Engineering

Academic Year: 2019-20

Semester: III

Sr. No.	Course Code	Course Name	Lecture	Tutorial	Practical	Credit
1	BTBSC301	Engineering Mathematics – III	3	1	-	4
2	BTCOC302	Discrete Mathematics	2	1	-	3
3	BTCOC303	Data Structures	2	1	-	3
4	BTCOC304	Computer Architecture & Organization	2	1	-	3
5	BTCOC305	Digital Electronics & Microprocessors	2	1	-	3
6	BTHM3401	Basic Human Rights	2	-	-	Audit
7	BTCOL306	Python Programming	1	-	2	2
8	BTCOL307	HTML and JavaScript	1	-	2	2
9	BTCOL308	Data Structures Lab	-	-	2	1
10	BTCOL309	Digital Electronics & Microprocessor Lab	-	-	2	1
11	BTES211P	Internship	-	-	-	1

Semester: IV

Sr. No.	Course Code	Course Name	Lecture	Tutorial	Practical	Credit
1	BTCOC401	Design & Analysis of Algorithms	2	1	-	3
2	BTCOC402	Probability & Statistics	2	1	-	3
3	BTCOC403	Operating Systems	2	1	-	3
4	BTCOE404A	Object Oriented Programming in Java	2	1	-	3
5	BTID405	Product Design Engineering	1	-	2	2
6	BTHM3402	Soft Skills and Personality Development	2	1	-	3
7	BTCOL407	Design & Analysis of Algorithms Lab	-	-	2	1

8	BTCOL408	Introduction to Data Science with R	1	-	2	2
9	BTCOL409	Object Oriented Programming Lab	-	-	2	1
10	BTCOL410	Operating System Lab	-	-	2	1
11	BTCOF411	Internship	-	-	-	1

Semester: V

Sr. No.	Course Code	Course Name	Lecture	Tutorial	Practical	Credit
1	BTCOC501	Database Systems	3	1	-	4
2	BTCOC502	Theory of Computations	3	1	-	4
3	BTCOC503	Machine Learning	3	1	-	4
4	BTCOE504 -A	Introduction to Research	2	-	-	2
5	BTCOE505 - B	Business Communication	2	-	-	2
6	BTCOC506	Competitive Programming-I	1	-	2	2
7	BTCOL507	Database System Laboratory	-	-	2	1
8	BTCOL508	Machine Learning Laboratory	-	-	2	1
9	BTCOS509	Seminar	-	-	2	1
10	BTCOF411	Internship	-	-	-	1

Semester: VI

Sr. No.	Course Code	Course Name	Lecture	Tutorial	Practical	Credit
1	BTCOC601	Compiler Design	3	1	-	4
2	BTCOC602	Computer Networks	3	1	-	4
3	BTCOE603 - C	Object-Oriented Analysis Design	2	1	-	3
4	BTCOE604 - C	Internet of Things	2	-	-	2
5	BTCOE605 -B	National Social Service	2	-	-	2
6	BTCOC606	Competitive Programming-II	1	-	2	2
7	BTCOL607 - B	Internet of Things Laboratory	-	-	2	2
8	BTCOL608	Computer Networks Laboratory	-	-	2	1
9	BTCOF609	Internship	-	-	-	1

Course Outcomes

Semster : III		
Course Name		**Engineering Mathematics – III**
Course Code		**BTBSC301**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, students will be able to:**
CO 1	Explain the application of the Laplace Transform to find solutions of system of linear equations arising in many engineering problem	
CO 2	Demonstarte and apply the concept Laplace Transform	
CO 3	Interpret Computation of Fourier Transform and their applications to engineering problems	
CO 4	Identify Partial Differential Equations and Their Applications.	
CO 5	Evaluate Functions of Complex Variables.	
Semster : III		
Course Name		**Discrete Mathematics**
Course Code		**BTCOC302**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Develop knowladge of Fundamental Structures and Basic Logic .	
CO 2	Classify basic concepts of Functions and Relations .	
CO 3	Apply and demonstrate knowladge of Graph in data structures.	
CO 4	Identify and explain knowladge of Trees in data structures.	
CO 5	Interpret basic concepts of Algebraic Structures and Morphism.	
Semster : III		
Course Name		**Data Structures**
Course Code		**BTCOC303**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Identify the concept of Dynamic memory management, data types, algorithms, Big O notation	

CO 2	Identify basic data structures such as arrays, linked lists, stacks and queues	
CO 3	Describe the hash function and concepts of collision and its resolution methods	
CO 4	Solve problem involving graphs, trees and heaps	
CO 5	Generate algorithms for solving problems like sorting, searching, insertion and deletion of data	
Semster : III		
Course Name		**Computer Architecture & Organization**
Course Code		**BTCOC304**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Identify the basic organization of computer system, its function, interconnection and CPU structure.	
CO 2	Explain basic instruction set, operations, addressing modes and RISC and CISC architecture.	
CO 3	Perform Arithmetic operations, 2's complement representation and operations with this representation.	
CO 4	Identify a memory module and analyze its operation by interfacing with the CPU.	
CO 5	Create the organization for the Control unit, Arithmetic and Logical unit, Memory unit and the I/O unit and I/O interfaces.	
Semster : III		
Course Name		**Digital Electronics & Microprocessors**
Course Code		**BTCOC305**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Examine the structure of number system and performs the conversion among different number systems.	
CO 2	Create combinational circuits for given application.	
CO 3	Design and analysis of synchronous and asynchronous sequential circuits using flip-flops.	
CO 4	Explain the architecture of 8086 microprocesor.	
CO 5	Write the program using 8086 microprocessor.	
Semster : III		
Course Name		**Basic Human Rights**
Course Code		**BTHM3401**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Expain the history of human rights.	
CO 2	Recall responsibilities of others caste, religion, region and culture.	

CO 3	Remember the importance of groups and communities in the society.
CO 4	Analyse the philosophical and cultural basis and historical perspectives of human
CO 5	Aware of their responsibilities towards the nation.

Semster : III		
Course Name		**Python Programming**
Course Code		**BTCOL306**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain programming, algorithms, data structure concepts and a simple Python program.	
CO 2	Make use of variables, operators and control-flow statements and Functions in Python program.	
CO 3	Illustrate Python Exception handling, String processing,basic input/output and file-handling methods	
CO 4	Analyze classes, Objects and data structures	
CO 5	Develop Python code with SQLite database	

Semster : III		
Course Name		**Seminar**
Course Code		**BTCOS307**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	List recent technical topics from interested domain.	
CO 2	Explain the applicability of modern software tools and technology.	
CO 3	Develop the detailed literature survey and built a document with respect to technical publications.	
CO 4	Analyze presentation and communication skills.	
CO 5	Create technical report preparation and professional skills.	

Semster : III		
Course Name		**Data Structures Lab**
Course Code		**BTCOL308**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Differentiate static and dynamic memory allocation techniques	
CO 2	Implement various operations on linear and non-linear data structures	
CO 3	Implement different searching and sorting techniques	

CO 4	Identity the appropriate data structure to solve a given problem	
CO 5	Compute time complexities of different algorithms	
Semster : III		
Course Name		Digital Electronics & Microprocessor Lab
Course Code		BTCOL309
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain the basic logic operations and logic circuit elements to create digital circuits	
CO 2	Construct basic combinational circuits and verify their functionalities	
CO 3	Analyse Comparator, Flipflop etc	
CO 4	Apply the design procedures to design basic sequential circuits	
CO 5	Analyse the basic digital circuits and to verify their operation	
Semster : IV		
Course Name		**Design and Analysis of Algorithm**
Course Code		**BTCOC401**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Define worst-case running times of algorithms using asymptotic analysis	
CO 2	Compare searching algorithms using divide-and-conquer paradigm.	
CO 3	Design algorithms using dynamic programming and back tracking methods.	
CO 4	Apply the greedy algorithms to solve real world problems such as knapsack and TSP.	
CO 5	Develop various types of programming paradigms in a high-level language.	
Semster : IV		
Course Name		**Probability & Statistics**
Course Code		**BTCOC402**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Apply knowledge of Bayes‘ theorem of inverse probability, Properties of probabilities.	
CO 2	Classify Relation between binomial and normal distributions.	
CO 3	Analyse Poisson and normal distributions, Importance of normal distribution.Properties of Karl Pearson's correlation coefficient and Spearman's rank correlation coefficient, Probable errors.	
CO 4	Demonstrate the Linear and non-linear regression, Lines of regression, Derivation of regression lines of y on x and x on y, Angle between the regression lines, Coefficients of regression.	

CO 5	Identify the principles of Estimation, Large Sample Estimation of a Population Mean, Small Sample Estimation of a Population Mean, Large Sample Estimation of a Population Proportion

Semster : IV		
Course Name		**Operating Systems**
Course Code		**BTCOC403**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain the basic concepts of operating systems .	
CO 2	Differentiate between programs, processes and threads.	
CO 3	Illustrate the concepts of process and scheduling algorithms.	
CO 4	Identify deadlock condition and use various algorithms to handle deadlocks.	
CO 5	Illustrate various memory mgmt,file mgmt and disk storage management mechanisms	

Semster : IV		
Course Name		**Object Oriented Programming in Java**
Course Code		**BTCOE404A**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain the concept of Hardware and Software, Programming Language, JDE, JDK, and the structure of Java Programs.	
CO 2	Illustrate Classes, Objects, Methods, and string operations.	
CO 3	Make use of Control Statements in java code.	
CO 4	Classify types of Array in java.	
CO 5	Demonstrate classes, objects and java packages.	
CO 6	Apply the concept of Inheritance and Polymorphism in java	

Semster : IV		
Course Name		**Product Design Engineering**
Course Code		**BTID405**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Define Simple Products and Modules.	
CO 2	Illustrate Creation and Knowledge Sharing.	
CO 3	Identify Self and Work Management.	
CO 4	Analyze Team Work and Communication.	

CO 5	Explain Managing Health and Safety.Data and Information Management.	
Semster : IV		
Course Name		**Soft Skills and Personality Development**
Course Code		**BTHM3402**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Demonstrates the skills to manage and express their emotions, thoughts, impulses and stress in effective ways.	
CO 2	Apply various time management techniques in productive manner.	
CO 3	Build performance, enhanced wellbeing, personal growth, or a sense of purpose	
CO 4	Develop interpersonal communication skills to establish and enhance personal and work-based relationships.	
CO 5	Design an effective Presentation and speak with greater control in front of others.	
Semster : IV		
Course Name		**Design and Analysis of algorithm Lab**
Course Code		**BTCOL407**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Analyze the performance of merge sort and quick sort algorithms using divide and conquer technique.	
CO 2	Develop algorithms using divide and conquer, greedy and dynamic programming	
CO 3	Design algorithms using dynamic programming and back tracking methods.	
CO 4	Apply the dynamic programming technique to solve real world problems such as knapsack and TSP.	
CO 5	Develop various types of programming paradigms in a high-level language.	
Semster : IV		
Course Name		**Data Science with R**
Course Code		**BTCOL408**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Choose R Studio, an advanced environment for using the R language (scripts, projects, customizing R studio)	
CO 2	Explain the R language syntax, how to write proper code for solving a given problem.	
CO 3	Develop a strong foundation on the R data-types and data-structures (vectors, matrices, lists, data.frames)	
CO 4	Examine the plot functions with base R, e.g. scatter plots, bar plots, box plots, histograms.	
CO 5	Design the R Package to do graphics and data visualization.	

Semster : IV		
Course Name		**Object Oriented Programming Lab**
Course Code		**BTCOL409**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Build Java code using Classes, Objects, and Operators in Java.	
CO 2	Make use of Control Statements in java code.	
CO 3	Create Java code by using different types of Array.	
CO 4	Develop Java code by using userdefined classes, objects and java packages.	
CO 5	Create Java code by implementing inheritance and Polymorphism	
Semster : IV		
Course Name		**Operating System Lab**
Course Code		**BTCOL410**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Use Unix environment and execute basic Unix Commands.	
CO 2	Execute Bash Shell commands.	
CO 3	Identify the CPU scheduling algorithms and page replacement algorithms.	
CO 4	Illustrate different memory management algorithms.	
CO 5	Identify different system calls.	
Semster : V		
Course Name		**Database Systems**
Course Code		**BTCOC501**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Identify the basics of SQL commands and construct queries using SQL.	
CO 2	Illustrate the sound design principles for logical design of databases, including the E-R method and normalization approach	
CO 3	Implement Basic DDL, DML , DCL commands, Understand Data selection and operators used in queries and restrict data retrieval and control the display order	
CO 4	Illustrate functions to summarize data, join multiple tables using different types of joins.	
CO 5	Demonstrate the PL/SQL architecture and write PL/SQL code for procedures, triggers, cursors, exception handling etc.	
Semster : V		

Course Name		Theory of Computation
Course Code		BTCOC502
Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Define Finite Automata machines for given problems and conversion of various Machine.	
CO 2	Illustrate given Finite Automata machine and find out its Language	
CO 3	Apply Pushdown Automata machine for given CF language(s)	
CO 4	Discover the strings/sentences of a given context-free languages using its grammar	
CO 5	Design Turing machines for given any computational problem.	
Semster : V		
Course Name		Machine Learning
Course Code		BTCOC503
Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Explain types of Machine learning, hypothesis space, bias, cross-validation, Linear regression, Decision trees and overfitting concepts	
CO 2	Illustrate Instance-based learning, Feature reduction, Collaborative filtering-based recommendation, Probability, and Bayes learning	
CO 3	Classify Logistic Regression and Support Vector Machine	
CO 4	Explian Neural network and deep learning concepts	
CO 5	Apply computational learning theory, PAC learning model, Sample complexity, VC Dimension, Ensemble learning.	
CO 6	Analyze Clustering k-means, adaptive hierarchical clustering, Gaussian mixture model	
Semster : V		
Course Name		Introduction to Research
Course Code		BTCOE504 -A
Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Understand the research process and develop the ability to apply the methods while working on a research project work.	
CO 2	Perform literature reviews through conducting Systematic Research Survey.	
CO 3	Identify procedures of sampling, measurement scales and instruments, data collection, analysis and framework for research studies.	
CO 4	Write a research report, thesis and Technical Presentations.	
CO 5	Choose the appropriate research design and develop appropriate research hypothesis for a research project.	
Semster : V		

Course Name		Business Communication
Course Code		BTCOE505 - B
Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Demonstrate verbal and non-verbal communication ability	
CO 2	communicate effectively in various situations.	
CO 3	Develop interpersonal communications skills that are required for social and business interaction.	
CO 4	Employ proper public speaking techniques.	
CO 5	Demonstrate the use of basic and advanced business communication skills.	
Semster : V		
Course Name		Competative Programming I
Course Code		(BTCOL506)
Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Explain how algorithmic problems can be solved	
CO 2	Recognize the time and memory complexity of an algorithm or a structure	
CO 3	Explain the concrete algorithms and data structures	
CO 4	Analyze the given problem and recognize subproblems	
CO 5	Apply the knowledge on a wider set of problems	
Semster : V		
Course Name		Database System Laboratory
Course Code		BTCOL507
Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Identify the basics of SQL commands and construct queries using SQL.	
CO 2	Identify the sound design principles for logical design of databases, including the E-R method and normalization approach.	
CO 3	Implement Basic DDL, DML , DCL commands, Understand Data selection and operators used in queries and restrict data retrieval and control the display order	
CO 4	Illustrate functions to summarize data, join multiple tables using different types of joins.	
Semster : V		
Course Name		Machine Learning Laboratory

Course Code		BTCOL508
Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Interpret Regression Models	
CO 2	Solve a given problem by using the Logistic Regression model	
CO 3	Make use of Random Forest and Parameter Tuning methodsRandom Forest and Parameter Tuning	
CO 4	Apply Clustering Algorithms and make its evaluation	
CO 5	Choose the appropriate research design and develop appropriate research hypothesis for a research project.	
CO 6	Develop Machine Learning Project in Python on House Prices Data.	
Semster : V		
Course Name		**Seminar**
Course Code		**BTCOS509**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Identify recent technical topics from interested domain.	
CO 2	Analyze the applicability of modern software tools and technology.	
CO 3	Create the detailed literature survey and built a document with respect to technical publications.	
CO 4	Develop presentation and communication skills.	
CO 5	Develop technical report preparation and professional skills.	
Semster : VI		
Course Name		**Compiler Design**
Course Code		**(BTCOC601)**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Define the various phases and architecture of a compiler and how these phases interact with each other.	
CO 2	Illustrate designing and implementing lexical analyzers and parsers,regular expressions, finite automata,context-free grammars	
CO 3	Apply semantic analysis , manage symbol tables by using variable scopes, data types, and other semantic aspects.	
CO 4	Apply various compiler optimization techniques for improving the efficiency of generated code.	
CO 5	Create efficient and optimized machine code or intermediate code from the input source code.	
Semster : VI		
Course Name		**Computer Network**

Course Code		BTCOC602
Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Recall the basic concept of Network, Transport and Application Layer.	
CO 2	Classify different terminologies of client server programming.	
CO 3	Apply various error detection and correction techniques at data link layer.	
CO 4	Analyze different network layer protocol like IPv4/IPv6,TCP,UDP and congestion control.	
CO 5	Elaborate different application layer protocol like DHCP, DNS, FTP, HTTP and SMTP.	
Semster : VI		
Course Name		**Object-Oriented Analysis Design**
Course Code		**BTCOE603C**
Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Describe basic OOAD concepts	
CO 2	Draw various UML diagrams	
CO 3	Identify various design patterns.	
CO 4	Illustrate Use case analysis and CRC card analysis	
Semster : VI		
Course Name		**Internet of Things**
Course Code		**BTCOE604 - C**
Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Explain the impact and challenges caused by IoT networks leading to new architectural model.	
CO 2	Compare smart objects and its deployment model and the technologies to connect to network.	
CO 3	Assess the role of IoT protocol for sustainable network communication.	
CO 4	Explain the need of Data Analytics and Security in IoT.	
CO 5	Identify Arduino, RaspberryPi and design different sensor technologies for sensing real world entities in applications of IoT in Industry.	
Semster : VI		
Course Name		**National Social Services**
Course Code		**BTCOE605 -B**

Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Know Introduction and Basic Concepts of NSS	
CO 2	Know Youth and community mobilization	
CO 3	Identify the importance and Role of Youth Leadership	
CO 4	Identify Life Competencies and skill.	
CO 5	Develop Social Harmony and National Integration.	
Semster : VI		
Course Name	**Comepative Programming II**	
Course Code	**BTCOL606**	
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain how algorithmic problems are solved	
CO 2	Recognize the time and memory complexity of an algorithm or a structure	
CO 3	Explain the concrete algorithms and data structures	
CO 4	Analyze the given problem and recognize subproblems	
CO 5	Apply the knowledge on a wider set of problems	
Semster : VI		
Course Name	**Internet of Things Laboratory**	
Course Code	**BTCOL607 - B**	
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain the different operating systems for Raspberry-Pi and OS installation on Raspberry-Pi.	
CO 2	Connectivity and configuration of Raspberry-Pi circuit with basic peripherals	
CO 3	Implement interfacing of various sensors with Raspberry Pi	
CO 4	Demonstrate the ability to transmit data between different devices.	
CO 5	Apply IoT concepts in different applications using Raspberry Pi	
Semster : VI		
Course Name	**Computer Network Laboratory**	
Course Code	**BTCOL608**	

Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Choose Different types of cables and implement cross-wired and straight cable using Climping Tool.	
CO 2	Illustration of Network Devices Repeater, Hub, Switch, Bridge, Router.	
CO 3	Organize the computer in Local Area Network.	
CO 4	Analyze a Network topology using Packet tracer software.	
CO 5	Construct a Network using Distance Vector routing protocol.	