Holy-wood Academy, Kolhapur's

SANJEEVAN ENGINEERING AND TECHNOLOGY INSTITUTE

Sanjeevan Knowledge City, Somwar Peth-Injole, Panhala, Tal. Panhala, Dist. Kolhapur

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2.6.1 Course objectives & Outcomes

Name of Program	Computer Science & Engineering	Program code	631524210

Class: S.Y.B.Tech (DBATU) Semester: III

Sr.No.	Course Code	Course Title	Course Objectives and Outcomes:
1	BTBSC301	Engineering Mathematics – III	Upon successful completion of this course, the student will be able to: • [M3CO1] Apply the Set theory and Relation concepts. • [M3CO2] Apply the Functions and define the recursive functions. • [M3CO3] Apply Laplace transform to different applications • [M3CO4] Apply Inverse Laplace transform to different applications. • [M3CO5] Identify the permutations and combinations.
2	BTCOC302	Discrete Mathematics	Upon successful completion of this course, the student will be able to: • [DMCO1] Understand sets, relations, functions and discrete structures. Apply Propositional logic and First order logic to solve problems. • [DMCO2] Express and solve number theoretic problems using algebraic properties of groups, rings and fields. • [DMCO3] To design and develop real time application using graph theory. • [DMCO4] Students would be able to model and analyze computational processes using analytic and combinatorial methods. • [DMCO5] Students will be able to use the methods learnt as part of this

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			subject in subsequent courses in the design and analysis of algorithms, theory of computation, and compilers. • [DMCO6] Develop a discrete model for a given computational problem and solve.
3	BTCOC303	Data Structures	Upon successful completion of this course, the student will be able to: • [DSCO1] Student should able to know fundamentals of data structures like array, list, linked list, stack, queue, tree, graph, hashing. • [DSCO2] Student should able to identify suitable data structure for application. • [DSCO3] Student should able to use data structure to solve problems. • [DSCO4] Student should able to implement various data structures and algorithm essential for implementing computer based solutions.
4	BTCOC304	Computer Architecture & Organization	Upon successful completion of this course, the student will be able to: • [CACO1] To understand the basic hardware and software issues of computer organization. • [CACO2] Identify functional units, bus structure and addressing modes. • [CACO3] Students will be able to identify where, when and how enhancements of computer performance can be accomplished. • [CACO4] Students will also be introduced to more recent applications of computer organization in advanced digital systems• [CACO5] Identify memory hierarchy and performance.
5	BTCOC305	Digital Electronics & Microprocessors	Upon successful completion of this course, the student will be able to: • [MPCO1] To understand the concepts of Architecture of 8086 Microprocessor. • [MPCO2] Ability to write assembly language programs to realize various high level language constructs, considering the architectural features, memory design of the underlying hardware. To realize the issues in

			computer architecture and organization. • [MPCO3] Ability to interface various programmable devices to the microprocessor and program them to perform data transfer in real life applications. • [MPCO4] Understand concept of interfacing of peripheral devices and their applications.
6	BTHM3401	Basic Human Rights	Upon successful completion of this course, the student will be able to: • [BHCO1] Be familiar with the major universal and regional systems of human rights law, their relationships to each other, and the legal value and authority of declarations, decisions, judgments and other materials generated by them. • [BHCO2] Develop an awareness of the primary areas of concern within the field of human rights law and other relevant branches of law, and the ways in which human rights are promoted and protected.
7	BTCOL306	Python Programming	Upon successful completion of this course, the student will be able to: • [PPCO1] Develop a basic understanding of the Python programming language. • [PPCO2] To learn how to design and program Python applications. • [PPCO3] Demonstrate significant experience with Python program development environment. • [PPCO4] Solve problems requiring the writing of well-documented programs in the Python language, including use of the logical constructs of that language.
8	BTCOL307	HTML and JavaScript	Upon successful completion of this course, the student will be able to: • [HJSCO1] Use a variety of strategies and tools to create websites. • [HJSCO2] Create a functioning web application suitable for portfolio presentation. • [HJSCO3] Learn the language of the web: HTML, CSS & JAVA Script • [HJSCO4] Understand and apply

			effective web design principles
9	BTCOL308	Data Structures Lab	After the completion of the course the student will be able to • [CO1] Compare various kinds of searching and sorting techniques • [CO12 Construct Linear and nonlinear data structures using arrays and linked list • [CO13 Demonstrate the concept of binary tree traversal and its operations • [CO14 Choose appropriate data structure to solve various computing problems.
10	BTCOL309	Digital Electronics & Microprocessor Lab	Course Outcomes: After the completion of the course, the student will be able • [CO1] To perform base conversion and arithmetic operations in various number systems • [CO2] To design digital circuits using simplified Boolean functions • [CO3] To develop simple design of combinational circuits • [CO4] Design and implement programs on 8085 microprocessor.
11	BTES211P	Field Training / Internship / Industrial Training Evaluation	Upon successful completion of this course, the student will be able to: • [FTCO1] To give students the opportunity to apply the knowledge and skills they have acquired on campus in a real-life work situation. • [FTCO2] To provide students with opportunities for practical, hands-on learning from practitioners in the students' areas of specialization. • [FTCO3] To expose students to a work environment, common practices, employment opportunities and work ethics in their relevant field. • [FTCO4] To enhance the employability skills of the students. • [FTCO5] To provide opportunities for students to be offered jobs in the organizations in which they undergo their Industrial Training.

Class: S.Y.B.Tech (DBATU) Semester: IV

Sr.No.	Course Code	Course Title			
1	BTCOC401	Design & Analysis of Algorithms	Upon successful completion of this course, the student will be able to: • [DACO1] Analyzing the amortized time complexity of a given algorithm and data structure operations. • [DACO2] Decide the appropriate design methodology for a given problem from among the paradigms of Divide and Conquer, Dynamic Programming, Greedy, Branch and Bound. • [DACO3] Design algorithms for network flows. • [DACO4] Distinguish between P and NP classes of problems.		
2	BTCOC402	Probability & Statistics	Course Objectives and Outcomes: • [PSCO1] Develop appropriate probabilistic model for a given problem of algorithmic nature and computation of its statistical parameters. • [PSCO2] Learning of different methods of statistics for data analysis. • [PSCO3] Modeling of various real life problems of operation research. • [PSCO4] Determine service time and waiting time in a queue. • [PSCO5] To understand elementary queuing concepts and apply elsewhere in computer science.		
3	BTCOC403	Operating Systems	Upon successful completion of this course, the student will be able to: • [OSCO1] Understand functional architecture of an operating system. • [OSCO2] To provide a detailed discussion of the various memory management techniques. • [OSCO3] Learn about and understand theoretical concepts and programming constructs used for the operation of modern operating systems. • [OSCO4] Gain practical experience with software tools		

			available in modern operating systems such as semaphores, system calls, sockets and threads. • [OSCO5] To understand key mechanisms in design of operating systems modules.
4	Elective-I BTCOE404A	Object Oriented Programming in Java	Upon successful completion of this course, the student will be able to: • [OJCO1] Appreciation and understanding of object oriented concepts and their utility. • [OJCO2] Apply Object oriented approach to design software. • [OJCO3] Ability to formulate the problem, come up with object oriented design. • [OJCO4] Practicing use of different features of Object Oriented Methodology like templates, exception handling, reflection etc. • [OJCO5] Study different systems and apply different design methodologies based on the problem specification and objectives.
5	BTCOE404B	Object Oriented Programming in C++	Course Objectives and Outcomes: Upon successful completion of this course, the student will be able to: • [OCCO1] Appreciation and understanding of object oriented concepts and their utility. • [OCCO2] Apply Object oriented approach to design software. • [OCCO3] Ability to formulate the problem, come up with object oriented design. • [OCCO4] Practicing use of different features of Object Oriented Methodology like templates, exception handling, reflection etc. • [OCCO5] Study different systems and apply different design methodologies based on the problem specification and objectives.
6	BTID405	Product Design Engineering	Upon successful completion of this course, the student will be able to: • [PDECO1] Competence with a set of tools and methods for product

			design and development. • [PDECO2] Confidence in your own abilities to create a new product. • [PDECO3] Awareness of the role of multiple functions in creating a new product (e.g. marketing, finance, industrial design, engineering, production). • [PDECO4] Ability to coordinate multiple, interdisciplinary tasks in order to achieve a common objective. • [PDECO15 Reinforcement of specific knowledge from other courses through practice and reflection in an action-oriented setting.
7	BTCOE40 6B	Numerical Methods	Upon successful completion of this course, the student will be able to: •[NMCO1] Determine an interpolating function for data. • [NMCO2] Solve initial value problems. • [NMCO3] aware of the use of numerical methods in modern scientific computing. • [NMCO4] Students would be able to assess the approximation techniques to formulate and apply appropriate strategy to solve real world problems.
8	BTHM340 2	Soft Skills and Personality Development	Upon successful completion of this course, the student will be able to: •[SSPDCO1] To give each student a realistic perspective of work and work expectations •[SSPDCO2] To help formulate problem solving skills •[SSPDCO3] To guide students in making appropriate and responsible decisions •[SSPDCO4] To create a desire to fulfill individual goals •[SSPDCO5] To educate students about unproductive thinking, self-defeating emotional impulses, and self- defeating behaviors.
9	BTCOL40 7	Design & Analysis of Algorithms Lab	Upon successful completion of this course, the student will be able to:

				• [CO1] Ability to analyze the performance of algorithms. • [CO2] Ability to choose appropriate algorithm design techniques for solving problems. • [CO3] Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs. • [CO4] Apply important algorithmic design paradigms and methods of analysis.
10	BTCOL408	Introduction to Data Science with R		Upon successful completion of this course, the student will be able to: • [DRCO1] Explain the key differences between the tasks of classification, clustering, regression, and dimensionality reduction. • [DRCO2] To appreciate supervised and unsupervised learning and their applications. • [DRCO3] Understand concepts around Business Intelligence and Business Analytics. • [DRCO4] Work on a real-life project, implementing supervised and unsupervised machine learning techniques to derive business insights. • [DRCO5] Propose a suitable visualization design for a particular combination of data characteristics and application tasks.
11	BTCOL409	Object Oriented Programming Lab		Upon successful completion of this course, the student will be able to: CO1. Creating simple programs using classes and objects in C++. CO2. Implement Object Oriented Programming Concepts in C++. CO3. Develop applications using stream I/O and file I/O. CO4. Implement simple graphical user interfaces. CO5. Implement Object Oriented Programs using templates and exceptional handling concepts.
12	BTCOL410	Operating System Lab		Course Outcome: After completion of this course student will be able

			to CO1: To familiarize with the architecture of Unix OS. CO2: Awareness of concepts of multiprogramming, multithreading and multitasking CO3: Demonstration of memory management algorithms
13	BTCOF41 1	Field Training/Internship/Industrial Training Evaluation	Upon successful completion of this course, the student will be able to: • [FTCO1] To give students the opportunity to apply the knowledge and skills they have acquired on campus in a real-life work situation. • [FTCO2] To provide students with opportunities for practical, hands-on learning from practitioners in the students' areas of specialization. • [FTCO3] To expose students to a work environment, common practices, employment opportunities and work ethics in their relevant field. • [FTCO4] To enhance the employability skills of the students. • [FTCO5] To provide opportunities for students to be offered jobs in the organizations in which they undergo their Industrial Training.

Class: T.Y.B.Tech (DBATU) Semester: V

Sr.No.	Course Code	Course Title	Course Objectives and Outcomes:
1	BTCOC50 1	Database Systems	Upon successful completion of this course, the student will be able to: • [DBCO1] Model, design and normalize databases for real life applications. • [DBCO2] To learn data models, conceptualize and depict a database system using ER diagram. • [DBCO3] Query Database applications using Query Languages like SQL. • [DBCO4] Understand validation framework like integrity constraints, triggers and assertions. • [DBCO5] Understand various

			storage structures and query optimization.
2	BTCOC502	Theory of Computations	Upon successful completion of this course, the student will be able to: • [TCCO1] Design finite state machines, regular expressions and grammars for given languages. • [TCCO2] Understand formal machines, languages and computations • [TCCO3] Develop analytical thinking and intuition for problem solving situations in related areas of theory of computation. • [TCCO4] To know the limitations of computation, i.e. the unsolvability of problems
3	BTCOC503	Machine Learning	Upon successful completion of this course, the student will be able to: • [MLCO1] Understand big data challenges in different domains including social media, transportation, finance and medicine. • [MLCO2] Understand the basics of Supervised, unsupervised & reinforcement leaning • [MLCO3] Use data analytics methods to make predictions for a dataset. • [MLCO4] Predict outcomes with supervised machine learning techniques. • [MLCO5] Apply basic machine learning algorithms Linear Regression, k-Nearest Neighbors (k-NN), k-means, Naive Bayes for predictive modeling to solve various real-life examples.
4	BTHME504 Elective-III	Introduction to Research	Upon successful completion of this course, the student will be able to: • [IRCO1] Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling. • [IRCO2] Have basic knowledge on qualitative research techniques • [IRCO3] Have adequate knowledge on measurement &

			scaling techniques as well as the quantitative data analysis • [IRCO4] Have basic awareness of data analysis-and hypothesis testing procedures
5	BTHME504 Elective-III	Cyber Laws	Upon successful completion of this course, the student will be able to: • [CLCO1] Critically evaluate ongoing developments in law relating to Information Technologies. • [CLCO2] Display an understanding of how these developments relate to one another. • [CLCO3] Examine areas of doctrinal and political debate surrounding rules and theories. • [CLCO4] Evaluate those rules and theories in terms of internal coherence and practical outcomes. • [CLCO5] Draw on the analysis and evaluation contained in primary and secondary sources.
6	BTHME505 Elective-IV	Business Communication	Upon successful completion of this course, the student will be able to: • [BCCO1] To participate in an online learning environment successfully by developing the implication-based understanding of Paraphrasing, deciphering instructions, interpreting guidelines, discussion boards & Referencing Styles. • [BCCO2] To demonstrate his/her ability to write error free while making an optimum use of correct Business Vocabulary & Grammar. • [BCCO3] To distinguish among various levels of organizational communication and communication barriers while developing an understanding of Communication as a process in an organization. • [BCCO4] To draft effective business correspondence with brevity and clarity. • [BCCO5] To stimulate their Critical thinking by designing and developing clean and lucid writing

			skills. • [BCCO6] To demonstrate his verbal and non-verbal communication ability through presentations.
7	BTCOC506	Competitive Programming-I	Upon successful completion of this course, the student will be able to: • [CPCO1] describe how algorithmic problems are solved • [CPCO2] recognize the time and memory complexity of an algorithm or a structure • [CPCO3]explain the concrete algorithms and data structures • [CPCO4] analyze the given problem and recognize subproblems • [CPCO5]apply the knowledge on a wider set of problems • [CPCO6]assemble the solutions of subproblems to solve the whole problem • [CPCO7]assess advantages and shortcomings of different algorithms
8	BTCOL507	Database System Laboratory	Upon successful completion of this course, the student will be able to: CO1. Apply the basic concepts of Database Systems and Applications. CO2. Use the basics of SQL and construct queries using SQL in database creation and interaction. CO3. Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system. CO4. Analyze and Select storage and recovery techniques of database system
9	BTCOL508	Machine Learning Laboratory	Upon successful completion of this course, the student will be able to: • [CO1]Understand the implementation procedures for the machine learning algorithms • [CO2]Design R/Python programs for various Learning algorithms. • [CO3]Apply appropriate data sets to the Machine Learning algorithms

			• [CO4]Identify and apply Machine Learning algorithms to solve real world problems
10	BTCOS509	Seminar	Upon successful completion of this course, the student will be able to: • [SMCO1] Distinguish the multiple senses of a text (literal and beyond the literal). • [SMCO2] Identify and understand assumptions, theses, and arguments that exist in the work of authors. • [SMCO3] Evaluate and synthesize evidence in order to draw conclusions consistent with the text. Seek and identify confirming and opposing evidence relevant to original and existing theses. • [SMCO4] Use discussion and the process of writing to enhance intellectual discovery and unravel complexities of thought.
11	BTCOF411	Internship/Industrial Training	Upon successful completion of this course, the student will be able to: • [FTCO1] To give students the opportunity to apply the knowledge and skills they have acquired on campus in a real-life work situation. • [FTCO2] To provide students with opportunities for practical, hands-on learning from practitioners in the students' areas of specialization. • [FTCO3] To expose students to a work environment, common practices, employment opportunities and work ethics in their relevant field. • [FTCO4] To enhance the employability skills of the students. • [FTCO5] To provide opportunities for students to be offered jobs in the organizations in which they undergo their Industrial Training.

Class: T.Y.B.Tech (DBATU) Semester: VI

Sr.No.	Course Code	Course Title	Course Objectives and Outcomes:
1	BTCOC601	Compiler Design	Upon successful completion of this course, the student will be able to: • [CDCO1] To inform students about different parsing techniques, techniques to generate intermediate code and different optimization techniques. • [CDCO2] To enrich the knowledge in various phases of compiler and its use. • [CDCO3] To introduce the concepts underlying the design and implementation of language processors. • [CDCO4] To provide practical programming skills necessary for constructing a compiler.
2	BTCOC602	Computer Networks	Upon successful completion of this course, the student will be able to: • [CNCO1] To develop an understanding of modern network architectures from a design and performance perspective. • [CNCO2] Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies. • [CNCO3] To study protocols, network standards, the OSI model, IP addressing, cabling, networking components, and basic LAN design. • [CNCO4] Ability to write program using socket programming.
3	BTCOE603 Elective-V	Artificial Intelligence	Upon successful completion of this course, the student will be able to: • [AICO1] To understand the notions of rational behavior and intelligent agents. • [AICO2] To develop a general appreciation of the goals, subareas, achievements and difficulties of AI. • [AICO3] To provide the knowledge of methods of blind as well as informed search and ability to practically apply the corresponding

			techniques. • [AICO4] To develop general understanding of major concepts and approaches in knowledge representation, planning, learning, robotics and other AI areas. • [AICO5] To developing programming skills for AI applications & exposure to logic programming with Prolog.
4	BTCOE60 3 Elective-V	Object-Oriented Analysis Design	Upon successful completion of this course, the student will be able to: • [OOCO1] Develop a working understanding of formal Object-Oriented Analysis and Design processes. • [OOCO2] Analyze real problems/requirements and design systems by developing specifications and abstractions to make development of complex systems easy. • [OOCO3] Develop the skills to determine which processes and OOAD techniques should be applied to a given project. • [OOCO4] Develop an understanding of the application of OOAD practices from a software project management perspective
5	BTCOE60 4 Elective-VI	Geographic Information System	Upon successful completion of this course, the student will be able to: • [GISCO1] describe what GIS is; name the major GIS software available; know where to find more information; • [GISCO2] explain the components and functionality of a GIS and the differences between GIS and other information systems; • [GISCO3] understand the nature of geographic information and explain how it is stored in computer (including map projection) and the two types of GIS data structure; • [GISCO4] conduct simple spatial analysis using GIS software; • [GISCO5] design and complete a GIS project from start to finish (data capture, data storage and

			management, analysis, and presentation);
6	BTCOE604 Elective-VI	Internet of Things	Upon successful completion of this course, the student will be able to: • [ITCO1] To learn the basic issues, policy and challenges in the Internet. • [ITCO2] To get an idea of some of the application areas where Internet of Things can be applied. • [ITCO3] To understand the cloud and Internet environment. • [ITCO4] To understand the various modes of communications with Internet.
7	BTHME605 Open Elective-VII	National Social Service	Upon successful completion of this course, the student will be able to: • [NSSCO1] Understanding the community • [NSSCO2] Understanding the needs & problems of the community. • [NSSCO3] Develop civic & social responsibility. • [NSSCO4] Acquire leadership quality & democratic attitude. • [NSSCO5] Develop competence in group living.
8	BTHME605 Open Elective-VII	Consumer Behaviour	Upon successful completion of this course, the student will be able to: • [CBCO1] Identify the major influences in consumer behavior • [CBCO2] Distinguish between different consumer behaviour influences and their relationships • [CBCO3] Establish the relevance of consumer behaviour theories and concepts to marketing decisions • [CBCO4] Implement appropriate combinations of theories and concepts • [CBCO5] Recognise social and ethical implications of marketing actions on consumer behavior • [CBCO6] Use most appropriate techniques to apply market solutions
9	BTCOC60	Competitive	Upon successful completion of this

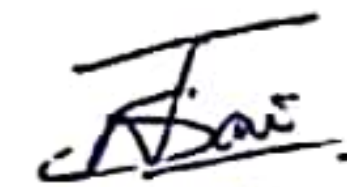|	6	Programming-II	course, the student will be able to: • [CPCO1] describe how algorithmic problems are solved • [CPCO2] recognize the time and memory complexity of an algorithm or a structure • [CPCO3]explain the concrete algorithms and data structures • [CPCO4] analyze the given problem and recognize subproblems • [CPCO5]apply the knowledge on a wider set of problems • [CPCO6]assemble the solutions of subproblems to solve the whole problem • [CPCO7]assess advantages and shortcomings of different algorithms
10	BTCOL60 7	Mobile Application Development	Upon successful completion of this course, the student will be able to: • [MADCO1] To learn the basics of mobile application development. • [MADCO2] To get accustomed to different Mobile Operating System platforms. • [MADCO3] To develop skills in developing applications on different flavors of Mobile Operating System.
11	BTCOL60 8	Computer Networks Laboratory	Upon successful completion of this course, the student will be able to: CO1: Understand fundamental underlying principles of computer networking CO2: Understand details and functionality of layered network architecture. CO3: Apply mathematical foundations to solve computational problems in computer networking CO4: Analyze performance of various communication protocols. CO5: Compare routing algorithms CO6: Practice packet /file transmission between nodes.
12	BTCOF60 9	Filed Training / Internship / Industrial Training	Upon successful completion of this course, the student will be able to: • [FTCO1] To give students the opportunity to apply the knowledge

			and skills they have acquired on campus in a real-life work situation. • [FTCO2] To provide students with opportunities for practical, hands-on learning from practitioners in the students' areas of specialization. • [FTCO3] To expose students to a work environment, common practices, employment opportunities and work ethics in their relevant field. • [FTCO4] To enhance the employability skills of the students. • [FTCO5] To provide opportunities for students to be offered jobs in the organizations in which they undergo their Industrial Training.

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