S.P.B. PATEL
ENGINEERING COLLEGE
SAFFRONY INSTITUTE OF TECHNOLOGY CAMPUS

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CYCLE 1
NAAC Accreditation 2023

Information Technology

Course Outcome

Submitted to

NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

BACHELOR OF COMPUTER Engg.(BE)	
SEMESTER I	
3110003	**PROGRAMMING FOR PROBLEM SOLVING**
	Course Outcomes
CO1	Formulate algorithm/flowchart for given arithmetic and logical problem
CO2	Translate algorithm/flowchart into C program using correct syntax and and execute it
CO3	Write programs using conditional, branching, iteration, and recursion
CO4	Decompose a problem into function
CO5	Develop an application using the concepts of array, pointer,structure, and file management to solve engineering and/or scientific problems
CO6	
3110007	**ENVIRONMENTAL SCIENCE**
	Course Outcomes
CO1	Identify the types of pollution in society along with their sources
CO2	Realize the global environmental issues
CO3	Conceptualize the principles of Green Buildings and Smart cities
CO4	Implement the concept of recycle and reuse in all fields of engineering
CO5	
CO6	
3110016	**BASIC ELECTRONICS**
	Course Outcomes
CO1	Analyze the general – and special-Purpose diode circuits
CO2	Design biasing circuits for BJT
CO3	Analyze BJT Circuits in small-signal domain
CO4	Analyze basic FET Circuits
CO5	Verify the functionalities of basic digital gates and logic families
CO6	Construct and test circuit using basic electronic devices in a group
3110006	**BASIC MECHANICAL ENGINEERING**
	Course Outcomes
CO1	Discuss the various sources of energy and basic terminology of Mechanical engineering
CO2	Make calculations for commonly used working fluids i.e. ideal gases and steam
CO3	Analyze various heat engine cycles and understand construction and working of IC engines
CO4	Discuss working and applications of steam boilers and various energy conversion systems
CO5	Discuss various power transmission elements and properties of various engineering materials with their applications
CO6	
3110014	**Mathematics-1**
	Course Outcomes

CO1	To apply differential and integral calculus to improper integrals and to determine applications of definite integral. Apart from some other applications they will have a basic understanding of indeterminate forms,Beta and Gamma functions.
CO2	To apply the various tests of convergence to sequence, series and the tool of power series and fourier series for learning advanced
CO3	To compute directional derivative, maximum or minimum rate of change and optimum value of functions of several variables.
CO4	To compute the areas and volumes using multiple integral techniques.
CO5	To perform matrix computation in a comprehensive manner.
CO6	
BACHELOR OF COMPUTER Engg.(BE)	
SEMESTER II	
3110013	**ENGINEERING GRAPHICS & DESIGN**
	Course Outcomes
CO1	Know and understand the conventions and the methods of engineering drawing
CO2	Interpret engineering drawings using fundamental technical mathematics
CO3	Construct basic and intermediate geometry and comprehend the theory of projection
CO4	Improve their visualization skills so that they can apply these skills in developing new products
CO5	Improve their technical communication skill in the form of communicative drawings
CO6	Use computer software for engineering drawing
3110015	**Mathematics-2**
	Course Outcomes
CO1	To apply mathematical tools needed in evaluating vector calculus and their usage like Work, Circulation and Flux.
CO2	To apply the laplace transform as tools which are used to solve differential equations and fourier integral representation.
CO3	To apply effective mathematical tools for the solutions of first order ordinary differential equations
CO4	To apply effective mathematical methods for the solutions of higher order ordinary differential equations.
CO5	To use series solution methods and special functions like Bessels' functions.
CO6	
3110005	**BASIC ELECTRICAL ENGINEERING**
	Course Outcomes
CO1	Apply fundamental electrical laws and circuit theorems to electrical circuits.
CO2	Analyze single phase and three phase AC circuits.
CO3	Describe operating principle and applications of static and rotating electrical machines.
CO4	Comprehend electrical installations, their protection and personnel safety.
CO5	
CO6	
3110012	**WORKSHOP/MANUFACTURING PRACTICES**

	Course Outcomes
CO1	Understand various manufacturing processes in machine shop and perform basic operations of welding, fitting, smithy and carpentry work a) perform basic operations of welding, fitting, smithy and carpentry work b) Explain various manufacturing processes in machine shop
CO2	Discuss application of plumbing fitting, masonry items and about plastic molding and glass cutting for various engineering
CO3	Measure different electrical quantities and trouble shoot electrical and electronics appliances
CO4	Conduct experiments with various kits such as Raspberry and Arduino for embedded system development
CO5	Use basic commands of computer operating systems
CO6	
3110018	**PHYSICS**
	Course Outcomes
CO1	The student will gain knowledge of basic theoretical and mathematical concept of electronic materials.
CO2	The student will demonstrate understanding of basic principles, properties and applications associated with semiconducting materials.
CO3	The student will demonstrate understanding of basic theory and properties associated with optoelectronic materials.
CO4	The student will gain knowledge of the different measurements techniques to characterize various semiconducting, electrical and
CO5	The student will demonstrate understanding of basic theory, properties and applications of Superconductivity.
CO6	
3110002	**ENGLISH**
	Course Outcomes
CO1	Use various forms of vocabulary in varied situations in oral and written communication.
CO2	Understand the phonetics and the transcription pattern to learn correct pronunciation.
CO3	Comprehend the dynamics of various rules of grammar and check its validation while they speak and write language
CO4	Use grammar effectively to make themselves competent Listener, Speaker, Reader and Writer by exposing to various set of situations.
CO5	Write various formal and informal documents of day to day life and professional set up.
CO6	Demonstrate the qualities of writing in diverse situation by using the nuances such as conciseness, clarity, accuracy, organization, and coherence.
Average	

BACHELOR OF Information Technology Engg.(BE)
SEMESTER III

	Data Structures(3130702)
	Course Outcomes
CO1	Define and classify various data structures, storage structures and common operations on them.
CO2	Create various linear data structures with their representation and perform different operations on them
CO3	Create various nonlinear data structures with their representation and perform different operations on them.
CO4	Apply various searching sorting techniques on data set.
CO5	Solve the given a problem using an appropriate data structure to achieve optimal performance and compare its performance with other possible data structures
CO6	

3130006	Probability & Statistics
	Course Outcomes
CO1	understand the terminologies of basic probability, two types of random variables and their probability functions
CO2	observe and analyze the behavior of various discrete and continuous probability distributions
CO3	understand the central tendency, correlation and correlation coefficient and also regression
CO4	apply the statistics for testing the significance of the given large and small sample data by using t- test, F-test and Chi-square test
CO5	understand the fitting of various curves by method of least square
CO6	

	Effective Technical Communication(3130004)
	Course Outcomes
CO1	Define and discuss dynamics of Verbal and Non Verbal aspects of Communication
CO2	Write various formal documents of technical and professional communication
CO3	Communicate in diverse formal situations taking place in organizations
CO4	Illustrate and examine the knowledge of ethical aspects of engineering

CO5	Demonstrate and explain social and professional etiquettes
CO6	Plan self-development and practice self-assessment

	Database Management Systems(3130703)
	Course Outcomes
CO1	Recognize the various elements of Database Management Systems
CO2	Given a problem statement, identify the entities and their relations and draw an E-R diagram and design database applying normalization
CO3	Solve the given problem using Relational Algebra, Relational Calculus, SQL and PL/SQL
CO4	Apply and relate the concepts of transaction, concurrency control, recovery and security in database
CO5	Recognize the purpose of query processing, optimization and demonstrate the SQL query evaluation
CO6	

	Digital Fundamentals(3130704)
	Course Outcomes
CO1	Solve the given problem using fundamentals of Number systems and Boolean algebra
CO2	Analyze working of logic families and logic gates and design the simple circuits using various gates for a given problem
CO3	Design and implement Combinational and Sequential logic circuits and verify its working
CO4	Examine the process of Analog to Digital conversion and Digital to Analog conversion
CO5	Implement PLDs for the given logical problem
CO6	

	Indian Constitution(3130007)
	Course Outcomes
CO1	Enhance human values , create awareness about law enactment and importance of Consitution
CO2	To Understand the Fundamental Rights and Fundamental Duties of the Indian Citizen to instill morality, social values, honesty, dignity of life and their social Responsbilities

CO3	Create Awareness of their Surroundings, Society, Social problems and their sutaible solutions while keeping rights and duties of the citizen keeping in mind.
CO4	Understand distribution of powers and functions of Local Self Government
CO5	Understand the National Emergency, Financial Emergency and their impact on Economy of the country
CO6	

BACHELOR OF COMPUTER Engg.(BE)
SEMESTER IV

	PRINCIPLES OF ECONOMICS AND MANAGEMENT(3140709)
	Course Outcomes
CO1	Analyze how elasticity affects revenue.
CO2	Relate production function and cost function.
CO3	Analyze the optimal quantity and pricing decisions of firms in different market structures (perfect competition, monopoly, monopolistic competition) to achieve profit maximization.
CO4	Describe the basic principles of management: planning, organizing, controlling, and directing.
CO5	Analyze ethical dilemmas faced by business and managers.

	Object Oriented Programming -I (3140705)
	Course Outcomes
CO1	Use various Java constructs, features and libraries for simple problems.
CO2	Demonstrate how to define and use classes, interfaces, create objects and methods, how to override and overload methods, compile and execute programs.
CO3	Write a program using exception handling, multithreading with synchronization.
CO4	Write a program using Files, binary I/O, collection Frameworks for a given problem.
CO5	Design and develop GUI based applications in a group using modern tools and frameworks.
CO6	

	Computer Organization & Architecture (3140707)
	Course Outcomes

CO1	Identify and explain the basic structure and functional units of a digital computer.
CO2	Identify the role and working of various functional units of a computer for execution of instruction.
CO3	Design processing unit using the concepts of ALU and control logic design.
CO4	Design interfacing of memory and I/O modules with CPU.
CO5	Implement assembly language programs and execute them.
CO6	Compare performance of different types of computer architectures

	Operating System & Virtualization (3141601)
	Course Outcomes
CO1	Learn and understand the concepts, core structure of Operating Systems and basic architectural components involved in operating systems design.
CO2	Understand the process management policies and scheduling of processes by CPU.
CO3	Evaluate the requirement for process synchronization and coordination handled by operating system.
CO4	Describe and analyze the memory management and its allocation policies.
CO5	Analyze various device and resource management techniques for timesharing
CO6	Conceptualize the components involved in designing a contemporary Operating Systems

	Discrete Mathematics(3140708)
	Course Outcomes
CO1	To understand the basic principles of sets and operations in sets and apply counting principles to determine probabilities. To determine the domain and range of a function, identify one-to-one functions, perform the composition of functions and apply the properties of functions to application problems.
CO2	To write an argument using logical notation and determine if the argument is or is not valid. To simplify and evaluate basic logic statements including compound statements, implications, inverses, converses, and contrapositives using truth tables and the properties of logic. To express a logic sentence in terms of predicates, quantifiers, and logical connectives.

CO3	To demonstrate an understanding of relations and to determine their properties. Be familiar with recurrence relations.
CO4	To understand and use the properties of algebraic structures.
CO5	To demonstrate different traversal methods for trees and graphs. Model problems in Computer Science using graphs and trees.
CO6	
BACHELOR OF COMPUTER Engg.(BE)	
SEMESTER V	

	Professional Ethics(3150709)
	Course Outcomes
CO1	Awareness of types of ethical challenges and dilemmas confronting members of a range of professions (business, media, police, law, medicine, research).
CO2	Identify and describe relevant theoretical concepts related to professional ethics in engineering.
CO3	Understand the basic perception of profession, professional ethics, various moral issues & uses of ethical theories.
CO4	Distinguish among morals, values, ethics, and the law and to explore how they each impact engineering practice.
CO5	Apply learning from Indian history and ethos to ethical practices in engineering.

	Cyber Security 3150714
	Course Outcomes
CO1	Describe system and web vulnerability.
CO2	Evaluate network defence tools.
CO3	Understand the cyber laws
CO4	Investigate a cybercrime, prepare report and apply laws for the case
CO5	
CO6	

	Integrated Personality Development Course(3150005)
	Course Outcomes
CO1	To provide students with a holistic value-based education that will enable them to be successful in their academic, professional, and social lives

CO2	To give the students the tools to develop effective habits, promote personal growth, and improve their wellbeing, stability, and productivity
CO3	To allow students to establish a stronger connection with their family through critical thinking and devolvement of qualities such as unity, forgiveness, empathy, and effective communication.
CO4	To provide students with soft skills that complement their hard skills, making them more marketable when entering the workforce.
CO5	To enhance awareness of India's glory and global values, and to create considerate citizens who strive for the betterment of their family, college, workforce, and nation
CO6	To inspire students to strive for a higher sense of character by learning from role models who have lived principled, disciplined, and value-based lives

	Computer Networks(3150710)
	Course Outcomes
CO1	Explain the basic terminologies used in networking and layered architecture of computer network
CO2	Comprehend basic protocols of application layer and how they can be used to assist in network design and implementation.
CO3	Describe and implement the essential principles of a connectionless and connection-oriented protocols used for reliable data transfer, flow control and congestion control
CO4	Design network architecture, assign IP addressing and apply various routing algorithms to find shortest paths for network-layer packet delivery.
CO5	Illustrate different link layer terminologies like error detection-correction, Multiple access protocol and Link layer addressing used in network.
CO6	

	Analysis and Design of Algorithms(3150703)
	Course Outcomes
CO1	Analyze the asymptotic performance of algorithms

CO2	Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
CO3	Find optimal solution by applying various methods.
CO4	Apply pattern matching algorithms to find particular pattern.
CO5	Differentiate polynomial and nonpolynomial problems.
CO6	Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems, when appropriate.

	Web Development(3151606)
	Course Outcomes
CO1	Understand the concepts of WWW, HTTP protocol and client-server architecture
CO2	Learn and apply various HTML tags to build the user friendly web pages.
CO3	Explore the new features of CSS to define and apply CSS rules in the web pages for rich User Interface
CO4	Create interactive web pages to improve the user experience using client side scripting with Javascript.
CO5	Design and develop fully functional dynamic web applications using the concepts of PHP, MySQL
CO6	Learn and apply advanced asynchronous web communication mechanisms like REST API, AJAX and JQuery for building highly interactive webpages
BACHELOR OF Information and Technology (BE)	
SEMESTER VI	

	ARTIFICIAL INTELLIGENCE (3161608)
	Course Outcomes
CO1	Ability to understand problem solving methods and their applications
CO2	Ability to analyze Searching, knowledge representation and Inferencing Techniques
CO3	Ability to apply problem solving, knowledge representation and reasoning techniques for various applications.
CO4	Ability to demonstrate practical applications of AI Techniques.

	Cryptography and Network security (3161606)
	Course Outcomes
CO1	Define terms related to cryptography, hashing, message authentication code, digital signature.
CO2	Describe and discuss symmetric key cryptography algorithms, public key cryptography algorithms, hashing algorithms, Message authentication code generation algorithms, digital signature algorithms, key generation and key management, issues in web security and solution, issues in Transport layer security and solution.
CO3	Demonstrate the generation of keys and execution of symmetric and public key algorithms from given data.
CO4	Implement cryptography solution for given security problem by identifying strength and weaknesses of algorithms based on cryptanalytic and brute force attack.

	Data Analysis & Visualization
	Course Outcomes
CO1	Perform descriptive statistics and dimensionality reduction.
CO2	Perform clustering and detect outliers
CO3	Perform data visualization
CO4	Apply the analytics and visualization to real world problems.
CO5	
CO6	

	Advanced Web Programming (3161611)
	Course Outcomes
CO1	Learn the concepts of client side programming using CSS and Java Script
CO2	Understand the concepts of Angular JS to extend basic HTML features
CO3	Learn Node JS framework to build dynamic server side applications
CO4	Study the concept of database using Mongo DB and connect database with application.
CO5	Design and implement full featured web application using the concepts of Angular JS and Node JS
CO6	

	SOFTWARE ENGINEERING(3161605)

	Course Outcomes
CO1	Prepare SRS (Software Requirement Specification) document and SPMP (Software Project Management Plan) document.
CO2	Apply the concept of Functional Oriented and Object Oriented Approach for Software Design.
CO3	Recognize how to ensure the quality of software product, different quality standards and software review techniques.
CO4	Apply various testing techniques and test plan in.
CO5	Able to understand modern Agile Development.
CO6	

	Integrated Personality Development Course(3150003)
	Course Outcomes
CO1	To provide students with a holistic value-based education that will enable them to be successful in their academic, professional, and social lives
CO2	To give the students the tools to develop effective habits, promote personal growth, and improve their wellbeing, stability, and productivity
CO3	To allow students to establish a stronger connection with their family through critical thinking and devolvement of qualities such as unity, forgiveness, empathy, and effective communication
CO4	To provide students with soft skills that complement their hard skills, making them more marketable when entering the workforce
CO5	To enhance awareness of India's glory and global values, and to create considerate citizens who strive for the betterment of their family, college, workforce, and nation
CO6	To inspire students to strive for a higher sense of character by learning from role models who have lived principled, disciplined, and value-based lives
BACHELOR OF COMPUTER Engg.(BE)	
SEMESTER VII	

	Internet of Things (3171108)
	Course Outcomes
CO1	Understand IoT architecture
CO2	Program Embedded IoT devices
CO3	Use IoT protocol to upload sensor data and to control devices
CO4	Design IoT application

CO5	
CO6	

	Internetwork security and web analytics 3171616
	Course Outcomes
CO1	Differentiate the security aspects in lower and upper layer protocols.
CO2	Explain the parameters, metrics and reports involved in analysis of website, blogs, search engine.
CO3	Explain the measurement of analytics parameters involved in E-mail.
CO4	Implement the test strategy for web site testing.
CO5	
CO6	

	Software Project Management(3171609)
	Course Outcomes
CO1	Describe and determine the purpose and importance of a software project and project management practices
CO2	Compare project approaches for given software project and identify risk factors.
CO3	Estimate and evaluate project cost and schedules and determine risk management approaches
CO4	Define and evaluate quality assurance measures
CO5	Implement a project to manage project schedule, expenses and resources with the application of suitable project management tools
CO6	

	Agile Development and UI/UX design(3171610)
	Course Outcomes
CO1	Understand the practices and philosophies of agile methods
CO2	Examine the User experiences and User designs with empirical and analytic evaluations
CO3	Demonstrate the connection between UX design with Agile software Development
CO4	Use an agile UX design and Agile software development method as per the need of the project.
CO5	

CO6	

	Computer Vision(3171614)
	Course Outcomes
CO1	Learn fundamentals of computer vision and its applications
CO2	Understand the basic image processing operations to enhance, segment the images.
CO3	Understand the analyzing and extraction of relevant features of the concerned domain problem
CO4	Understand and apply the motion concepts and its relevance in real time applications
CO5	Apply the knowledge in solving high level vision problems like object recognition, image classification etc
CO6	

	Wireless Communication(3171608)
	Course Outcomes
CO1	Understand the basics of wireless communication and propagation of radio signals
CO2	Understand the basic concepts of cellular system and design requirements
CO3	Design mobile radio propagation model
CO4	Differentiate multiple access techniques.
CO5	Compare various wireless communication systems and networks.
CO6	