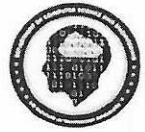


(Affiliated to Visvesvaraya Technological University, Belagavi & Approved by AICTE, New Delhi.)



Subject: Engineering Mathematics-III(TCSFNT)		Subject Code: 18MAT31
Course Outcomes		
CO1	Know the use of periodic signals and Fourier series to analyze circuits and systems communication.	
CO2	Explain the general linear system theory for continuous - time signals and digital signal processing using the Fourier transform and z-transform.	
CO3	Employ appropriate numerical methods to solve algebraic and transcendental equations.	
	Apply Green's theorem, Divergence theorem and Stokes theorem in various applications in the	

CO5	Determine the external of functional and solve the simple problems for calculus of variations. Utilize the concepts of functional and their variations in the applications of communication systems, decision theory, synthesis and optimization of digital circuits.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2													
CO2	3	2													
CO3	3	2													
CO4	3	2													
CO5	3	2													
Average	3	2													

Subject: Data Structures and Applications										Subject Code:18CS32					
Course Outcomes															
CO-1	Apply the knowledge of fundamentals of C language and definition of data structure														
CO-2	Analyze and demonstrate the stacks, queues operations and its applications														
CO-3	Create data storage using linked lists concepts and demonstrate its applications														
CO-4	Construct trees data structures and perform operations such as traversals, searching and expression evaluation.														
CO-5	Use graph based data structure approach for storing, sorting, searching of data and understand file handling basics														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3												3		
CO2		2									2				
CO3			3								2				
CO4			2												
CO5				2											
Average	3	2	1.5	2							2		3		

Subject: Analog and Digital Electronics										Subject Code: 18CS33					
Course Outcomes															
CO-1	Design and Analyze Analog Electronic Application Circuits using Transistor, Timer IC, Power Supply and regulator IC and Opamp IC.														
CO-2	Simplification of logical expression of digital circuits using Karnaugh map and Quine Mc Clusky methods.														
CO-3	Analyze the combinational circuits and design the different data processing circuits like multiplexers, decoders, tri state buffers, PLD'S.														
CO-4	Understand various gates and flipflops with additional inputs and to write VHDL code for same.														
CO-5	Design different data processing circuits, registers and counters using appropriate flip flops and compare the types.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1		2	2										2		
CO2	2	2											2		
CO3		2	3										2		
CO4	2	2												3	
CO5			2	2										2	

Average	2	2	2.33	2									2	2.5	
---------	---	---	------	---	--	--	--	--	--	--	--	--	---	-----	--

Subject: Computer Organization										Subject Code:18CS34					
Course Outcomes															
CO-1	Explain the basic organization of a computer system and acquire the knowledge of machine instructions and memory operations.														
CO-2	Illustrate the importance of Interrupts, bus arbitration and bus interface in accessing the I/O devices.														
CO-3	Explain and compare different memory subsystem and memory mapping techniques.														
CO-4	Analyze and evaluate the simple arithmetic and logical units.														
CO-5	Illustrate the hardwired control and micro programmed control, Basics of Pipelining.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3												2		
CO2	2	1											1		
CO3	2	2	1										1		
CO4	3	3	1										2		
CO5	2	2	1												
Average	2.4	2	1										1.5		

Subject: Software Engineering										Subject Code:18CS35					
Course Outcomes															
CO-1	Understand software engineering methods, software process, models, ethical and professional issues														
CO-2	Analyze various system models in designs implemented														
CO-3	Evaluate software to verify and validate using various testing methods.														
CO-4	Create quality project plan for software development.														
CO-5	Apply advanced software development methods like agile programming for better software development practices.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2													
CO2		2													
CO3		2											2		
CO4			2		2										
CO5					2										
Average															

Subject: Discrete Mathematical Structures										Subject Code:18CS36					
Course Outcomes															
CO-1	Verify the correctness of an argument using propositional and predicate logic and truth tables.														
CO-2	Demonstrate the ability to solve problems using counting techniques and combinatorics in the context of discrete probability.														
CO-3	Solve problems involving recurrence relations and generating functions														
CO-4	Construct proofs using direct proof, proof by contraposition, proof by contradiction, and proof by cases, and mathematical induction.														
CO-5	Explain, differentiate graphs and trees and construct optimal solution														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3

CO1	1	2	2										1		
CO2	2	2	2										2	1	
CO3	3		3											1	
CO4	3	3	2									1		1	1
CO5		2	3	2								2	2	1	1
Average	2.25	2.25	2.4	2								1.5	1.6	1	1

Subject: Analog Digital Electronics Lab										Subject Code:18CSL37					
Course Outcomes															
CO-1	Design different types of wiring and instrument connections and to evaluate the performance characteristics of electronic circuits.														
CO-2	Choose testing and experimental procedures on different types of electronic circuit and analyze their operation at different operating conditions.														
CO-3	Identify the overheads in practical experiment simulation results and develop a new design to overcome those problem.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2		2									2		
CO2	2	2		1									2		
CO3	3	2										3	2		
Average	2.66	2		1.5								3	2		

Subject: Data Structures Laboratory										Subject Code:18CSL38					
Course Outcomes															
CO-1	Able to implement linear and nonlinear data structures and understand its applications														
CO-2	Create and analyze searching and sorting algorithms in data structures.														
CO-3	Demonstrate data structure for solving real world problems														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1		2												2	
CO2			2											2	
CO3		2	2											2	
Average		2	2											2	

Semester-IV

Subject: Engineering Mathematics-IV(capsm)		Subject Code: 18MAT41
Course Outcomes		
CO-1	Solve first and second order ordinary differential equations arising in flow problems using single step and multistep numerical methods.	
CO-2	Solve problems of Quantum, mechanics employing Bessel's function relating to cylindrical polar coordinate systems and Legendre's polynomials relating to spherical polar coordinate systems.	
CO-3	Understand the analyticity, potential fields, residues and poles of the complex potential in the field theory and electromagnetic theory.Describe conformal and bilinear tranformation arising in aerofoil theory, fluid flow visualisation and image processing.	
CO-4	Solve problems on probability distributions relating to digital signal processing.Determine joint probability distributions and stochastic matrix connected with the multivariable correlation problems for feasible random events.	
CO-5	Draw the validity of the hypothesis processed for the given sampling distribution in accepting or rejecting the hypothesis.Define transition probability matrix of a Markov chain and solve problems	

related to discrete parameter random process.

CO-PO-PSO Mapping

COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2													
CO2	3	2													
CO3	3	2													
CO4	3	2													
CO5	3	2													
Average	3	2													

Subject: Design and Analysis of Algorithm

Subject Code:18CS42

Course Outcomes

CO-1	Understand the basics of algorithm, methods for analyzing algorithm and also expressing the boundaries of efficiencies using asymptotic notations
CO-2	Describe the method of divide and conquer and when to use such algorithms
CO-3	Describe dynamic programming paradigm and explain when an algorithm design situation calls for it
CO-4	Describe Backtracking and branch and bound approaches
CO-5	Analyze different classes of algorithms such as P,NP and NP hard

CO-PO-PSO Mapping

COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2											2		2
CO2	3	3	3										2		2
CO3	3	3	3										2		2
CO4	3	2	3										2		2
CO5	2												2		2
Average	2.8	2.5	3										2		2

Subject: Operating Systems

Subject Code:18CS43

Course Outcomes

CO-1	Demonstrate need for Operating System and different types of Operating System.
CO-2	Apply suitable techniques for Management of different resources.
CO-3	Use processor, memory, storage and file system commands.
CO-4	Define deadlocks situation and solve deadlock scenarios in a operating system.
CO-5	Realize the different concepts of operating system in platform of usage through case studies.

CO-PO-PSO Mapping

COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3												2	2	
CO2	2	2	1										2	2	
CO3	1	2	1										1	1	
CO4		2	2												
CO5	2		2												1
Average	2	2	1.5										1.66	1.6	1

Subject: MICROCONTROLLERS AND EMBEDDED SYSTEMS

Subject Code:18CS44

Course Outcomes

CO-1	Describe the architectural features, fundamentals of ARM based systems.
------	---

CO-2	Apply the knowledge of ARM instruction set for programming ARM to develop different applications.														
CO-3	Outline the importance of Embedded Systems and Interfacing the Hardware Components and I/O with ARM Microcontroller.														
CO-4	Interpret the basic hardware components and their selection method using design attributes to develop the hardware/ software co-design and firmware design.														
CO-5	Demonstrate the need of real time operating system for embedded system applications.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3												3		
CO2	2	2												2	
CO3	2		2												2
CO4			2												2
CO5	3											1	2		
Average	2.5	2	2									1	2.5	2	2

Subject: Object Oriented Concepts										Subject Code:18CS45					
Course Outcomes															
CO-1	Understand the object oriented concepts using c++														
CO-2	Demonstrate the fundamentals of java and working of java development kit														
CO-3	Understand object oriented concepts like class,inheritance,exception handling, packages and interfaces in java														
CO-4	Interpret exception handling and demonstrate multithreading in java														
CO-5	Develop simple GUI and handling events using applets and strings														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3		1										2	2	1
CO2	1		2		3									2	
CO3	3	2	2									1	2	2	
CO4			2										1	2	
CO5			3		2								2	2	
Average	2.33	2	2		2.5							1	1.75	2	1

Subject: Data Communication										Subject Code:18CS46					
Course Outcomes															
CO-1	Define and illustrate basic computer network technology, data transmission techniques and wireless network														
CO-2	Explain the different types of data transmission techniques														
CO-3	Explain the switching error detection techniques														
CO-4	Explain the data link layer concepts, subnetting														
CO-5	Explain different network standards														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2												2		
CO2	2	2											2		
CO3	2	2										2	1		1
CO4	2	2											1		1
CO5	2	2										2	1		1
Average	2	2										2	1.4		1

Course Outcomes

CO-1	Write programs in java to solve Various problems.
CO-2	Implement Quicksort, Merge sort , and Dynamic algorithm
CO-3	Implement Backtracking algorithms for the sum of subset and Hamiltonian cycle, greedy algorithm, for Knapsack prims and kruskal's

CO-PO-PSO Mapping

COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2			1								2	2	2
CO2	2	2			1								2	2	2
CO3	2	2			1								2	2	2
Average	2	2			1								2	2	2

Course Outcomes

CO-1	Develop, conduct and test ALP on data transfers, Arithmetic, Logical and Branch instructions using ARM7TDMI/LPC2148 and Keil u Vision 4 Tool/Compiler.
CO-2	Develop and conduct experiments to interface DAC, ADC, Stepper motor, DC motor on ARM7TDMI/ LPC2148 evaluation board using Embedded C and Keil u Vision 4 Tool/ Compiler.
CO-3	Develop, conduct and test experimentsto interface 4x4 keyboard, LED & LCD to display message on ARM7TDMI/ LPC2148 evaluation board using Embedded C and Keil u Vision 4 Tool/ Compiler.

CO-PO-PSO Mapping

COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2		2									2		
CO2	2	2		1									2		
CO3	3	2										3	2		
Average	2.66	2		1.5								3	2		

Semester-V

Course Outcomes

CO-1	Define the management, organization, entrepreneur , planning ,staffing ,ERP.
CO-2	outline the importance of directing leadership styles, controlling and communication
CO-3	Describe the quality and characteristics of entrepreneurs.
CO-4	Utilize the resources available effectively through ERP.
CO-5	Make use of IPR's and institutional support in entrepreneurship and Appraise the importance of Entrepreneurs through case studies.

CO-PO-PSO Mapping

COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3					1			1		2	1			2
CO2	2							1	3	2	2	1			2
CO3	2					3	2	3	2	2	2	1			3
CO4	2					1	2	1	1	2		1			2
CO5	2					1	2	1	2	2	3	2			2
Average	2.2					1.5	2	1.5	1.8	2	2.25	1.5			2.2

Subject: Computer Networks and Security										Subject Code:18CS52					
Course Outcomes															
CO-1	Demonstration of Application layer protocols.														
CO-2	Recognize transport layer services and infer UDP/TCP protocols.														
CO-3	Identify and classify the routers and apply Routing algorithms in Network layer.														
CO-4	Disseminate the wireless and mobile networks covering IEEE 802.11 standard.														
CO-5	Describe multimedia networking and network management.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	1											2		
CO2	2	1												1	
CO3	2	2				1						1		1	1
CO4	1					1						1	1		1
CO5	1					1						1	1		1
Average	1.8	1.33				1						1	1.33	1	1

Subject: Database mangement system									Subject Code:18CS53						
Course Outcomes															
CO-1	Inculcate basic concepts, applications & architecture of Database Management System.														
CO-2	Apply design principles & represent the description of Database using ER diagram and gain knowledge on relational Database theory.														
CO-3	Construct Queries using Relational Algebra expressions and SQL on commercial relational database system(Oracle) and Illustrate to tune the Database design using normalization techniques														
CO-4	Learn basic issues of transaction processing and concurrency control recovery														
CO-5	Design and develop any database application system successfully.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3														
CO2		2	3												
CO3		1	2		3										
CO4	3														
CO5		2	2		3										3
Average	3	1.66	2.33		3										3

Subject: Automata Theory and Computability										Subject Code:18CS54					
Course Outcomes															
CO-1	Demonstrate knowledge of basic mathematical models of computation and describe how they relate to formal languages														
CO-2	Formulate the problems in terms of Regular expression and context free grammar for language recognizes														
CO-3	Analyze the strengths and weaknesses of Computational Models														
CO-4	Design a automata(Abstract machine) to recognize the languages														
CO-5	Solve a problem with respect to different models of computation														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2											1		
CO2		2	2										2		
CO3		1	3										2		
CO4		3	1										2		

CO5		2	2										2		
Average	3	2	2										1.8		

Subject: Application Development with Python										Subject Code:18CS55					
Course Outcomes															
CO-1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions														
CO-2	Demonstrate proficiency in handling Strings and File Systems.														
CO-3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions														
CO-4	Interpret the concepts of Object-Oriented Programming as used in Python														
CO-5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3												1		
CO2	2				1								2		
CO3		2			2								2		
CO4	2		2											1	1
CO5		2			2							2	2	1	
Average	2.3	2	2		1.6							2	1.7	1	1

Subject: Unix Programming										Subject Code:18CS56					
Course Outcomes															
CO-1	Explain unix architecture,file system and use of basic commands														
CO-2	Illustrate shell programming to write shell scripts														
CO-3	Categorize,compare and make use of unix system calls														
CO-4	Build an application/service over a unix system														
CO-5															
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2											2		
CO2	2		3									1	2		
CO3	2	2											2		
CO4	3	2	2										2		
CO5															
Average	2.75	2	2.5									1	2		

Subject: Computer Networks Lab										Subject Code:18CSI.57					
Course Outcomes															
CO-1	Analyze and Compare various networking protocols, security and error checking mechanisms.														
CO-2	Demonstrate the working of different concepts of computer networking														
CO-3	Analyze ,implement and evaluate networking protocols using NS2/NS3														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1		2													
CO2				1											

CO3		2											2		
Average		2		1									2		

Subject: DBA Lab with mini project										Subject Code:18CSL58					
Course Outcomes															
CO-1	Create,update and query on the database														
CO-2	Demonstrate the working of different concepts of DBMS														
CO-3	implement,analyze and evaluate the project developed for an application														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3				2								3	1	3
CO2	2				2								3	1	2
CO3	1	2	3		3	1			2	1	2	2	2	2	3
Average	2	2	3		2.3	1			2	1	2	2	2.6	1.3	2.6

Semester-VI

Subject: System Software and Compilers										Subject Code:18CS61					
Course Outcomes															
CO-1	To understand the concepts of system software, application software and different hypothetical machine architecture.														
CO-2	Familiarize with source file,symbol table creation(pass1),object file creation(pass2),loaders and linkers														
CO-3	To understand the fundamental concepts of translators and strategies for parsing techniques														
CO-4	Device and perform syntax directed translation schemes for compiler for better optimization														
CO-5	Apply the knowledge of synthesis phase and analyze the correlation between syntax tree and code generation.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2										1		
CO2		2	2										1	1	
CO3	3		3											1	1
CO4		2	2										3	2	
CO5	3	2													
Average	3	2.75	2.25										1.66	1.33	1

Subject: Computer Graphics & Visualziation											Subject Code:18CS62					
Course Outcomes																
CO-1	Explain the Concepts of Computer Graphics and usage of open GL															
CO-2	Illustrate geometric transformation and viewing functions on 2D objects															
CO-3	Demonstrate the concepts of clipping, 3D transformations, color and illumination model															
CO-4	Differentiate various projection and viewing techniques on 3D objects															
CO-5	Demonstrate the use of various API for input interaction to develop GUI															
CO-PO-PSO Mapping																
COs	POs												PSOs			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	

CO1	3	1			2								1		
CO2	3	2			2							1	1	1	1
CO3	3	2			2							1	1	1	2
CO4	2	2			2							2	1	1	2
CO5	3	1			2							2	2	1	2
Average	2.8	1.6			2							1.5	1.2	1	1.75

Subject: Web Technology and Application												Subject Code:18CS63			
Course Outcomes															
CO-1	Understand and Adapt HTML and CSS syntax and semantics to build web page														
CO-2	Construct and visually format tables and forms using HTML and CSS														
CO-3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.														
CO-4	Appraise the principles of object oriented development using PHP														
CO-5	Inspect JavaScript frameworks like j Query and Backbone which facilitates developer to focus on core features.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2											2	2	
CO2	2	2	2										2	2	
CO3	2	2	2										2	2	
CO4	2	2											2		
CO5	2	2	2									2	2	2	2
Average	2.2	2	2									2	2	2	2

Subject: Data Mining and Warehousing												Subject Code:18CS641			
Course Outcomes															
CO-1	Understand the basic concepts of data mining and data warehousing														
CO-2	Identify data mining problems and implement the data warehouse														
CO-3	Write association rules for a given data pattern														
CO-4	Describe the classification and clustering techniques														
CO-5	Choose between classification and clustering solution a given problem														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3												2		
CO2		2												2	
CO3			3						1					2	
CO4		2	2			2						1		2	2
CO5	3	2										1			3
Average															

Subject: Cloud Computing and Applications		Subject Code:18CS643
Course Outcomes		
CO-1	Explain cloud computing, virtualization and classify services of cloud computing	
CO-2	Illustrate architecture and programming in cloud	
CO-3	Analyze the importance of Concurrent and High throughput computing	
CO-4	Illustrate the importance of Data intensive computing using Map Reduce programming	
CO-5	Describe the platforms for development of cloud applications and List the application of cloud	
CO-PO-PSO Mapping		

COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2												2		
CO2		2											2		
CO3		2											2		
CO4		1			1								2	1	
CO5	1	1			1							1	2	1	1
Average	1.5	1.5			1							1	2	1	1

Subject: Advanced java and J2EE										Subject Code:18CS644					
Course Outcomes															
CO-1	Understand and Apply enumeration and autoboxing concepts in managing the data in objects														
CO-2	understand and Apply collection concepts to store, access, remove, sort the data														
CO-3	Understand, apply and create a solution for string pattern matching, searching and extracting														
CO-4	Understand, apply and create a web interface using JSP concepts and learn to deploy the web application to app server.														
CO-5	Understand, apply and create a solution to manage the back-end data base using JDBC concepts														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2												2		
CO2		2	2										2	2	
CO3	3	2	2											2	
CO4	2		2		2		1							1	2
CO5	2		2		2	1							2	2	1
Average	2.25	2	2		2	1	1						2	1.7	1.5

Subject: Data structures and applications										Subject Code:18CS652					
Course Outcomes															
CO-1	Apply the knowledge of fundamentals of C language and definition of data structure														
CO-2	Analyze and demonstrate the stacks, queues operations and its applications														
CO-3	Create data storage using linked lists concepts and demonstrate its applications														
CO-4	Construct trees data structures and perform operations such as traversals, searching and expression evaluation.														
CO-5	Use graph based data structure approach for storing, sorting, searching of data and understand file handling basics														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3												3		
CO2		2									2				
CO3			3								2				
CO4			2												
CO5				2											
Average	3	2	1.5	2							2		3		

Subject: System Software lab										Subject Code:18CSL66					
Course Outcomes															
CO-1	Implement and demonstrate lexers and parsers														
CO-2	Implement and demonstrate top down, bottom up parsing and generation of intermediate code.														
CO-3	Implement different algorithms required for memory management, process scheduling, resource allocation used in operating system														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2			2									2	
CO2		2	2										2		
CO3	2	2	2												
Average	2	2	2		2								2	2	

Subject: Computer Graphics with mini project										Subject Code:18CSL67					
Course Outcomes															
CO-1	Illustrate the concepts of computer graphics and implement computer graphics application using open GL														
CO-2	Develop and execute polygon filling,clipping,algorithms and animate curves using openGL														
CO-3	Design and implement basic transformation and viewing functions on objects using opengl for real world problems														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	2		2							1	1		1
CO2	2	2	2		2							1		1	1
CO3	2	2	3		2				2	2	2	1		2	2
Average	2	2	2.3		2				2	2	2	1	1	1.5	1.3

Semester-VII

Subject: AI & ML										Subject Code:18CS71					
Course Outcomes															
CO1	Understand the theory of AI and basic concepts of ML and its types														
CO2	Identify optimal techniques for a given problem														
CO3	Illustrate AI and ML learning algorithms														
CO4	Apply ML techniques towards real world analysis														
CO5	Design an application using ML methods														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3									1		2		2
CO2		2			2							2	2		
CO3	2											1			
CO4	2	2				2					2	2		1	
CO5			3	1							1	1		2	
Average															

Subject: Big Data Analytics										Subject Code:18CS72				
Course Outcomes														
CO1		Understand the fundamentals of Big Data Analytics												

CO2	Investigate Hadoop framework And Hadoop distributed file System														
CO3	Illustrate the concepts of NoSQL using MongoDB and Cassandra for BigData														
CO4	Demonstrate the map reduce programming model to process bigdata along with Hadoop tools														
CO5	Use machine learning algorithms for real world big data and analyze web content and social networks to provide analytics with relevant visualization tools														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3											3		
CO2	3	2		3	2							1	3	2	
CO3	3	2	2	3	3							1	3		2
CO4	3	2	2	3	3							1	3		2
CO5	3	3	2	3	3	1						1	3		2
Average	3	2.4	2	3	2.75	1						1	2	2	2

Subject: User Interface Design										Subject Code:18CS734					
Course Outcomes															
CO1	Understand the significance and characteristics of User Interface Design														
CO2	Demonstrate the user interface design process and understand the business function														
CO3	Apply System menu creation, formatting menus and navigation schemes														
CO4	Discuss window characteristics, screen-based controls and device based controls														
CO5	Design test plan and prototype of user interface design														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2											2		
CO2	2					1							2		
CO3	2							2					2		
CO4		2												2	
CO5	3	2											2		
Average	2.5	2				1		2					2	2	

Subject: DIP										Subject Code:18CS741					
Course Outcomes															
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
Average															

Subject: Cryptography										Subject Code:18CS744					
Course Outcomes															
CO1	Discuss cryptography and its need to various applications														
CO2	Design and develop simple cryptography algorithms.														
CO3	Analyze different digital signature algorithm and key management techniques for secure communication														
CO4	Compare and examine different protocols used in Wireless LAN														
CO5	Understand cyber security and cyber Law needs.														
CO6	Discuss cryptography and its need to various applications														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	1				1							1		
CO2	3	2				1							2	1	
CO3	2	2				2							2		
CO4	2	2		1		2							3		
CO5								3				2			2
Average	2.5	1.7		1		1.5		3				2	2	1	2

Subject: AI & ML Lab										Subject Code:18CSI.76					
Course Outcomes															
CO1	Explore various python libraries useful for real time applications and apply appropriate datasets to ML algorithms														
CO2	Understand the implementation procedure for the machine learning and AI algorithms														
CO3	Identify, apply and evaluate ML algorithms to solve real world problems														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2			3									2		
CO2	2	2											2		
CO3	1	2	2	2	2							2	2	2	
Average															

Subject: Project Phase -I										Subject Code:18CSP77					
Course Outcomes															
CO1	Gain knowledge on societal real time problems and identify innovation required														
CO2	Undertake identified problems statement in different domains														
CO3	Analyse the problem statement through literature survey														
CO4	Formulation of designing Process														
CO5	Knowing the functionality of team work / Individuals														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2											2	2		
CO2		2										1			
CO3		3										2	1		
CO4			1								2			1	
CO5									3			2			
Average	2	2.5	1						3		2	1.75	1.5	1	

Subject: IOT										Subject Code:18CS81					
Course Outcomes															
CO1	Interpret the impact and Challenges posed by IoT networks leading to new Architectural models														
CO2	Compare and Contrast the depoloyment of smart objects and the technologies to connect them to network														
CO3	Appraise the role of IoT protocols for efficient network communication														
CO4	Elaborate the need of Data Analytics and its security in IoT														
CO5	Illustrate different sensor technologies for sensing real worl entities and identify the applications of lot in Industry														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3												1		
CO2	2	2											2		
CO3	2	2											1		
CO4		1				2							1		
CO5	2	2											2	1	
Average	2.25	1.75				2							1.4	1	

Subject: Storage Area Network										Subject Code:18CS822					
Course Outcomes															
CO1	Identify key challenges in managing information along with RAID implementations.														
CO2	Describe different storage networking technologies and virtualization.														
CO3	Illustrate backup, archive and replication. Explain components and the implementations of NAS.														
CO4	Determining different cloud computing deployment models, service models and infrastructure components.														
CO5	Illustrate the storage infrastructure and management activities.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2											2		
CO2	1	2	2									1			
CO3	2												2		2
CO4	2		2		1	1							1	1	2
CO5	1	2										2			2
Average	1.8	2	2		1	1						1.5	1.66	1	2

Semester-VIII

Subject: No SQL		Subject Code:18CS823
Course Outcomes		
CO1	Define, compare and use the four types of NoSQL databases	
CO2	Demonstrate and understanding of the detailed architecture, define objects,load data,query data and performance of column oriented NoSQL, databases	
CO3	Illustrate the map reduce programming model and understanding of key value databases,key value stored features,consistency,multi operation transactions	
CO4	Explain the detailed architecture define objects, load data, query data and performance tune of document oriented NoSQL databases	

CO5	Analyze the detailed architecture load data,query data and performance tune of graph database in NoSQL databases														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2			3							1	3		2
CO2	2	2	3		3							1	3		2
CO3	2	2	3		3							1	3		2
CO4	2	2	3		3							1	3		2
CO5	2	2	3		3							1	3		2
Average	2.2	2	3		3							1	3		2

Subject: Project Phase -2										Subject Code:18CSP83					
Course Outcomes															
CO1	Design engineering solution to complex problems utilizing a system approach using modern tools														
CO2	Communicate with peers, supervisor engineers and society														
CO3	Implement the innovative designed work and conduct performance analysis using engineering project principles.														
CO4	Demonstrate the work done and knowledge gained in completed work														
CO5	Demonstrated work presented in terms of Dissertation and / or Publications														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1			3		3	2						2	3	3	2
CO2								2	3	3		2		2	2
CO3		3		3							3	2	3	3	2
CO4							2		2	2	3	2		2	2
CO5								2	2	3	2	2			2
Average		3	3	3	3	2	2	2	2.33	2.66	2.66	2	3	2.5	2


Subject: Technical Seminar										Subject Code:18CSS84					
Course Outcomes															
CO1	Identify and Analyze information about emerging technologies with respect to current trends.														
CO2	Identify promising new directions of various cutting edge technologies with intrapersonal skills.														
CO3	Communicate effectively to a diverse audience, exhibit effective communication skills.														
CO4	Students should discuss appropriate modern engineering and IT Tools in new innovations and inventions.														
CO5	Explain various techniques and skills used for preparing detailed report along with results.														
CO-PO-PSO Mapping															
COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2											2		
CO2	2	2											1		
CO3	2	2							2	3			2		
CO4	2	2			1								2		
CO5	2	2				1	2						2		
Average	2	2			1	1	2		2	3			1.8		

Subject: Internship										Subject Code:18CSI85									
Course Outcomes																			
CO1		Identify and apply the problem using engineering knowledge																	

CO2	Design and implement new concepts in multidisciplinary area.
CO3	Explore career alternatives prior to graduation in different domains
CO4	Demonstrate professional and ethical practice
CO5	Gain more experience in accomplishing a long-term project, and managing the progress continuously.

CO-PO-PSO Mapping

COs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2											2	1	
CO2			3						2	2				1	2
CO3		1	1						2			2			3
CO4			2					2						2	
CO5											2	2			2
Average	3	1.5	2					2	2	2	2	2	2	1.33	2.33


 Head of the Department
 Dept. of Computer Science and Engineering
SJB INSTITUTE OF TECHNOLOGY
 BGS Health & Education City
 No. 67, Uttarahalli Road, Kengeri,
 Bengaluru-560 060.