Course Outcomes and CO-PO-PSO Articulation Matrix

Batch 2018-22

Semester-I/II

Subject: Programming in C & Data Structures	Subject Code:
Course Outcomes	
CO-1	Achieve knowledge, with respect to the development of C problem solving skills.
CO-2	Understanding and analyzing basic principles of programming in C language
CO-3	Design and development of various programming skills
CO-4	Effective utilization of memory using pointer techniques.
CO-5	Understand the basic concepts of pointer and data structures

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	1	2											2		
CO3	1		2										1	1	
CO4	1	2													
CO5	3	1										1			
Average	1.8	1.66	1.5									1	1.66	1	

Subject: Computer Programming Laboratory	Subject Code:
Course Outcomes	
CO-1	Gaining knowledge on various parts of computer
CO-2	Analyzing problems through Drawing flowcharts and writing algorithms
CO-3	Design and development of C problem solving skills

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	1										1		1
CO3		2	2						1	1		2		2	
Average	2	2	1.5						1	1		2	1.5	2	1.5

Semester-III

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 continous - time signals and digital signal processing using the Fourier transform and z-transform.
CO3	Employ appropriate numerical methods to solve algebraic and transcedental equations.
	Apply Green's theorem, Divergence theorem and Stokes theorem in various applications in the

CO5	Determine the extermals 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 boumndaries of efficiencies using aymptotic notations
CO-2	Describe the method of divide and conquer and when to use such algorithms
CO-3	Describe dynamic propgramming 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 Systen and different types of Operating System.
CO-2	Apply suitable techniques for Management of different resources.
CO-3	Use prosessor , memory ,storage and file system commands.
CO-4	Define deadlocks situation and solve deadlock scenarious in a operating system.
CO-5	Realize the different concepts of opertaing 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

Subject: Design and Analysis of Algorithm Lab	Subject Code:18CSL47

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

Subject: Microcontroller and Embedded SystemsLab	Subject Code:18CSL48

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

Subject: Management and Entrepreneurship	Subject Code:18CS51

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: 18CSL57		
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, processscheduling,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: 18CSL76

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 -1	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 Iot 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
JB INSTITUTE OF TECHNOLOGY
BGS Health & Education City,
No. 67, Uttarahalli Road, Kengeri,
Bengaluru-560 060.