



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



Department of Computer Science and Engineering

Course Outcomes and CO-PO-PSO Articulation Matrix

Batch 2015-19Semester-I/II[illegible]

Semester-III

| | | |
|---|---|------------------------------|
| Subject: Engineering Mathematics-III | | Subject Code: 15MAT31 |
| 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: Analog and Digital Electronics | | | | | | | | | | Subject Code:15CS32 | | | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Define and explain the current voltage characteristics of semiconductor and analog devices. | | | | | | | | | | | | | | |
| CO-2 | Demonstrate the combinational and sequential logic circuits by using various logical blocks. | | | | | | | | | | | | | | |
| CO-3 | Design and Compare various digital data communication efficiency using Data Processing Circuits. | | | | | | | | | | | | | | |
| CO-4 | Apply various methods to get more efficient throughput in synchronous counters and sequential circuit applications using flip flop and registers. | | | | | | | | | | | | | | |
| CO-5 | Evaluate and develop an understanding the concept ADC, DAC blocks required for data conversion. | | | | | | | | | | | | | | |
| CO-PO-PSO Mapping | | | | | | | | | | | | | | | |
| COs | POs | | | | | | | | | | | | PSOs | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| CO1 | 2 | 1 | | | | | | | | | | | 1 | | |
| CO2 | 2 | | 1 | | | | | | | | | | | 2 | |
| CO3 | | 2 | | | | | | | | | | | 1 | | |
| CO4 | | | 1 | | | | | | | | | | | 1 | |
| CO5 | | 2 | 1 | | | | | | | | | | | | 2 |
| Average | 2 | 1.6 | 1 | | | | | | | | | | 1 | 1.5 | 2 |

| | | | | | | | | | | | | | | | |
|--------------------------|--|---|---|---|---|---|---|---|---|---------------------|----|----|------|---|---|
| Subject: Data Structures | | | | | | | | | | Subject Code:15CS33 | | | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Able to understand fundamentals of C language and definition of data structures | | | | | | | | | | | | | | |
| CO-2 | Analyse 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 structures 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 | | 2 | | | | | | | | | | | 2 | | |
| CO2 | | 2 | | | | | | | | | 2 | | | | |
| CO3 | | | | | 2 | | 2 | | | | | | | | |
| CO4 | | | | | 2 | | | | | | | | | 2 | |
| CO5 | | | 2 | | | | 2 | | | | | | | | |
| Average | | 2 | 2 | | 2 | | 2 | | | | 2 | | 2 | 2 | |

Course Outcomes

| | |
|------|---|
| CO-1 | Explain the basic organization of a computer system |
| CO-2 | Examine the importance of I/O organization and interrupts in computer system |
| CO-3 | Demonstrate functioning main memory and importance of virtual memory and secondary storage |
| CO-4 | Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems |
| CO-5 | Design and analyze simple arithmetic and logical units |

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 | 2 | | | | | | | | | | | | 2 | | |
| CO5 | | 2 | 2 | | | | | | | | | | 2 | | |
| Average | 2 | 2 | 2 | | | | | | | | | | 2 | | |

Course Outcomes

| | |
|------|---|
| CO-1 | Understand multi user unixes and its basic features and variation |
| CO-2 | Interpret unix commands shell basics and shell environments using interpretive manner |
| CO-3 | Design and develop shell programming using filters, communication, system calls and terminologies |
| CO-4 | Design and develop unix file IO unix processes and awk programming |
| CO-5 | Write perl scripts |

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 | | | | | | | | | | | | | | |
| CO3 | | | 2 | | | | | | | | | | | | |
| CO4 | | | 2 | | | | | | | | | | | | |
| CO5 | | | | 1 | | | | | | | | | | 2 | |
| Average | 3 | | 2 | 1 | | | | | | | | | 2 | 2 | |

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, proof by cases, and mathematical induction. |
| CO-5 | Explain and differentiate graphs and trees |

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 | | 2 | | | | | | | | | | | | | |
| CO3 | 2 | | | | | | | | | | | | | | |
| CO4 | 2 | 2 | | | | | | | | | | | | | |
| CO5 | | | 2 | | | | | | | | | | 2 | | |

| | | | | | | | | | | | | | | | |
|---------|---|---|---|--|--|--|--|--|--|--|--|--|---|--|--|
| Average | 2 | 2 | 2 | | | | | | | | | | 2 | | |
|---------|---|---|---|--|--|--|--|--|--|--|--|--|---|--|--|

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----------------------|----|----|------|---|---|
| Subject: Analog Digital Electronics Lab | | | | | | | | | | Subject Code:15CSL37 | | | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Design different types of writing and insruments connections and to evluate performance characteristics of electronic circuits | | | | | | | | | | | | | | |
| CO-2 | Choose testing and exoerimental procedures on different types of electronic circuits and analyze their operation different operating conditions | | | | | | | | | | | | | | |
| CO-3 | Identify the overheads in practical experriments 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 | 2 | 2 | | | | | | | | | | | 1 | | |
| CO2 | | | 1 | | | | | | | | | | | 2 | |
| CO3 | | | 1 | | 1 | | | | | | | | | | 1 |
| Average | 2 | 2 | 1 | | 1 | | | | | | | | 1 | 2 | 1 |

| | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|----|----|----------------------|------|---|---|
| Subject: Data Structures and application lab | | | | | | | | | | | | Subject Code:15CSL38 | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO1 | Design and test of diode circuits | | | | | | | | | | | | | | |
| CO2 | Design and test of oscillator and amplifier, analyze the circuit performance. | | | | | | | | | | | | | | |
| CO3 | Use of universal gates and lcs for code conversion and arithmetic operation. | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | Subject Code:15MAT41 | | | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO1 | Solve first and second ordinary differential equations arising in flow problems using single step and multistep numerical methods. | | | | | | | | | | | | | | |
| CO2 | Solveproblems of quantum mechanics employing Bessel's function relating to cyclindrical polar coordinatesystems and Legendre's polynomials relating to spherical polar coordinate systems | | | | | | | | | | | | | | |
| CO3 | Understand the analyticity,potentialfields,residues and poles of complex potentials in field theory and electromagnetic theory Describe conformal and bilinear transformation arising in acrofoil theory fluid flow visualization and image processing | | | | | | | | | | | | | | |
| CO4 | Solve problems on probability distributions relating to digital signal processing. Determie joint probability distributions and stochastic matrix connected with multivariate correlation problems for feasible random events | | | | | | | | | | | | | | |
| CO5 | Draw the validity of the hypothesis proposed for the given sampling distribution in accepting or rejecting the hypothesis,Definetransition 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: SOFTWARE ENGINEERING | | | | | | | | | | Subject Code:15CS42 | | | | | |
|-------------------------------|---|---|---|---|---|---|---|---|---|---------------------|----|----|------|---|---|
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Understand Software Engineering methods, software process models, ethical and professional | | | | | | | | | | | | | | |
| CO-2 | Analyze various system models in design and implementation | | | | | | | | | | | | | | |
| CO-3 | Evaluate software to verify and validate using various testing methods | | | | | | | | | | | | | | |
| CO-4 | Create a quality project plan for software development | | | | | | | | | | | | | | |
| CO-5 | Apply advanced software development methods like Agile and Extreme programming for better software development practice | | | | | | | | | | | | | | |
| 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 | 2 | 2 | 2 | | 2 | | | | | | | | 2 | | |

| Subject: Design and Analysis of Algorithms | | | | | | | | | | Subject Code:15CS43 | | | | | |
|--|---|---|---|---|---|---|---|---|---|---------------------|----|----|------|---|---|
| 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 progprogramming 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 | 2 | 2 | | | | | | | | | | | 1 | | |
| CO2 | 2 | 2 | | | | | | | | | | | 1 | | |
| CO3 | 2 | 2 | | | | | | | | | | | 1 | | |
| CO4 | 2 | 2 | | | | | | | | | | | 1 | | |
| CO5 | 2 | 2 | | | | | | | | | | | 1 | | |
| Average | 2 | 2 | | | | | | | | | | | 1 | | |

| | | |
|---|---|----------------------------|
| Subject: MICROPROCESSOR AND MICROCONTROLLERS | | Subject Code:15CS44 |
| Course Outcomes | | |
| CO-1 | Describe the architecture of 8086 and ARM | |
| CO-2 | Illustrate the various addressing modes of 8086 and its operation | |
| CO-3 | Apply the concepts of 8086 in programming | |
| CO-4 | Demonstrate the 8086 Interrupts and its Programming | |
| CO-5 | Explain the concepts of ARM Interfacing and its Application | |

CO-PO-PSO Mapping

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

Subject: Object Oriented Concepts

Subject Code:15CS45

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, 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 swings |

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 | |
| CO4 | | | 2 | | | | | | | | | | | 2 | |
| CO5 | | | 2 | | | | | | | | 2 | | | 2 | |
| Average | 2 | | 2 | | 2 | | | | | | 2 | 2 | | 2 | |

Subject: Data Communication

Subject Code:15CS46

Course Outcomes

| | |
|------|---|
| CO-1 | Illustrate basic computer network technology |
| CO-2 | Identify the different types of network topologies and protocols. |
| CO-3 | Enumerate the layers of the OSI model and TCP/IP functions of each layer. |
| CO-4 | Make out the different types of network devices and their functions within a network. |
| CO-5 | Demonstrate the skills of IEEE Ethernet configurations |

CO-PO-PSO Mapping

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

Subject: Design and Analysis of Algorithm Lab

Subject Code:15CSL47

Course Outcomes

| | |
|------|--|
| CO-1 | write programs in java to solve Various problems |
| CO-2 | Implement quick sor, merge sort and Dynamic algorithm |
| CO-3 | implement Backtracking algorithms for the sum of subset and Hamiltonian cycle, greedy algorithm, for Knapsack prims and kruskals |

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 | 3 |
| CO2 | 2 | 2 | | | | | | | | | | | 2 | | |
| CO3 | 2 | 2 | | | | | | | | | | | 2 | | |
| Average | 2 | 2 | | | | | | | | | | | 2 | 2 | |

Subject: Microprocessor and Microcontroller Lab

Subject Code: 15CSL48

Course Outcomes

- CO-1 | Percieve the significance of Assembly Language Programming
CO-2 | Develop application using 8086 Instruction set
CO-3 | Demonstrate the functioning of hardware devices and Interfacing them using 8086 and ARM family

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 | 3 |
| CO2 | | 2 | | | | | | | | | | | | 2 | |
| CO3 | | | | | 3 | | | | | | | | | 2 | |
| Average | 2 | 2 | | | 3 | | | | | | | | 1 | 2 | |

Semester-V

Subject: Management and Entrepreneurship

Subject Code: 15CS51

Course Outcomes

- CO-1 | Define the management, organization, enterprenur, planning, staffing, ERP.
CO-2 | outline the importance of directing leadrship styles, controlling and communication
CO-3 | Describe the quality and characterstics of entrepreneurs.
CO-4 | Utilize the resources available effectively thrloug ERP..
CO-5 | use of IPR's and institutional support in entrepreneurship

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 | | | | | |
| CO3 | | | | | | | | 3 | | | | | | | 2 |
| CO4 | | | | | | | 2 | | | | | | | | 2 |
| CO5 | | | | | | | | | | | | 2 | | | 2 |
| Average | 3 | | | | | | 2 | 3 | | 2 | | 2 | | | 2 |

Subject: Computer Networks

Subject Code: 15CS52

Course Outcomes

- CO-1 | Demonstration of Application layer protocols.
CO-2 | Recognize transport layer services and infer UDP/TCP protocols.
CO-3 | Classify routers, IP and 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 | 3 | | | 2 | | 3 | | | | | | | 1 | 1 |
| CO4 | 1 | | | 1 | | 2 | | | | | | 1 | | 1 |
| CO5 | 1 | | | 1 | | 2 | | | | | | 1 | | 1 |
| Average | 2 | 1 | | 1.25 | | 2.33 | | | | | | 1.33 | 1 | 1 |

Subject: Database mangement system

Subject Code:15CS53

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 | | | | | | | | | | | | 3 | | |
| CO2 | | 2 | 3 | 2 | | | | | | | | | 2 | | |
| CO3 | | 1 | 2 | | 3 | 1 | | | | | | | | 3 | |
| CO4 | 3 | | | | | | | | | | | | 3 | | |
| CO5 | | 2 | 2 | 1 | 3 | 1 | | | 1 | | 1 | 3 | | 2 | 2 |
| Average | 3 | 1.6 | 2.3 | 1.5 | 3 | 1 | | | 1 | | 1 | 3 | 2.6 | 2.5 | 2 |

Subject: Automata Theory and Computability

Subject Code:15CS54

Course Outcomes

| | |
|------|--|
| CO-1 | Demonstrate an in-depth understanding of theories , concepts and techniques in automata and their link to computing. |
| CO-2 | Compare the different models of Computation like Deterministic , Non deterministic and software models |
| CO-3 | Describe Grammars and Automata for different language classes and become knowledgeable about restricted models of computation(Regular, Context Free) and their relative powers |
| CO-4 | Develop skills in formal reasoning and reduction of a problem to a formal model with an emphasis on semantic precision and conciseness |
| CO-5 | Formulate 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 | | |
| CO2 | | | 2 | | 3 | | | | | | | | | 3 | |
| CO3 | | 2 | | | | 2 | | | | | 3 | | | | |
| CO4 | | 3 | | | | | | | | | | | | | 2 |
| CO5 | | | | 2 | | | 3 | | | | | | | | |
| Average | 3 | 2.5 | 2 | 2 | 3 | 2 | 3 | | | | 3 | | 2 | 3 | 2 |

Subject: Advanced Java and J2EE

Subject Code:15CS553

Course Outcomes

| | |
|------|---|
| CO-1 | Interpret the need of advanced java concepts such as enumerations ,auto-boxing and annotations. |
| CO-2 | Understand the working of collection framework and build programs in java |
| CO-3 | Demonstrate string and link functions and implement the string operations. |

| CO-4 | Build web application using servelets,java server pages and deployment in web server. | | | | | | | | | | | | | | |
|-------------------|---|---|---|---|---|---|---|---|---|----|----|----|------|---|---|
| CO-5 | Illustrate the database access and manage data using JDBC concepts in java. | | | | | | | | | | | | | | |
| 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 | |
| CO4 | | | | | 2 | | | | | | | | | | 2 |
| CO5 | | | 2 | | | | | | | | | | 2 | 2 | |
| Average | 2 | 2 | 2 | | 2 | | | | | | | | 2 | 2 | 2 |

| Subject: Artificial Intelligence | | | | | | | | | | Subject Code: 15CS562 | | | | | |
|----------------------------------|--|---|---|---|---|---|---|---|---|-----------------------|----|----|------|---|---|
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Understand the problem where A I is needed and solving using Heuristic search approaches | | | | | | | | | | | | | | |
| CO-2 | Analaysis the Issues in representing the knowledge and deriving the rules to represent the knowledge | | | | | | | | | | | | | | |
| CO-3 | Understand and analyse the different AI technique to solve problems | | | | | | | | | | | | | | |
| CO-4 | Define learning techniques and compare learning techniques | | | | | | | | | | | | | | |
| CO-5 | Discuss on natural language processing and Expert systems | | | | | | | | | | | | | | |
| 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 | | 3 | | | | | | | | | 2 | | |
| CO3 | | 2 | 2 | | | | | | | | | | | 2 | |
| CO4 | | 2 | | | | | | | | | | | 2 | 2 | |
| CO5 | | 2 | 2 | | | | | | | | | | 2 | | |
| Average | 2 | 2 | 2 | 3 | | | | | | | | | 2 | 2 | |

| | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|----------------------|----|----|------|---|---|
| Subject: DOT NET APPLICATION | | | | | | | | | | Subject Code:15CS564 | | | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Create, test and debug Android application by setting up Android development environment. | | | | | | | | | | | | | | |
| CO-2 | Implement adaptive, responsive user interfaces that work across a wide range of devices. | | | | | | | | | | | | | | |
| CO-3 | Implement adaptive, responsive user interfaces that work across a wide range of devices. | | | | | | | | | | | | | | |
| CO-4 | Infer long running tasks and background work in Android applications. | | | | | | | | | | | | | | |
| CO-5 | Describe the steps involved in publishing Android application to share with the world. | | | | | | | | | | | | | | |
| CO-PO-PSO Mapping | | | | | | | | | | | | | | | |
| COs | POs | | | | | | | | | | | | PSOs | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| CO1 | 2 | | | | | | | | | | | | 1 | | |
| CO2 | | 2 | | | | | | | | | | | 1 | | |
| CO3 | | | 2 | | | | | | | | | | | 1 | |
| CO4 | | | | 2 | | | | | | | | | | 1 | |
| CO5 | | | | | 2 | | | | | | | | | 1 | |
| Average | 2 | 2 | 2 | 2 | 2 | | | | | | | | 1 | 1 | |

| | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|--|---|--|--|--|--|--|--|--|-------------------------------|--|--|--|--|--|--|--|--|--|
| Subject: Computer Networks Lab | | | | | | | | | | Subject Code: 15CSI.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:15CSL58 | | | | | |
| 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 | 2 | 2 | | | | | | | | 3 | | |
| CO2 | | | 3 | | 3 | | | | | | | | | 3 | |
| CO3 | | 2 | 3 | 2 | 3 | 2 | | | 2 | | 3 | 2 | | 2 | 3 |
| Average | 3 | 2 | 3 | 2 | 2.6 | 2 | | | 2 | | 3 | 2 | 3 | 2.5 | 3 |

Semester-VI

| | | | | | | | | | | | | | | | |
|--|--|---|---|---|---|---|---|---|---|---------------------|----|----|------|---|---|
| Subject: Cryptography Network Security and Cyber Law | | | | | | | | | | Subject Code:15CS61 | | | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Discuss cryptography and its need to various applications | | | | | | | | | | | | | | |
| CO-2 | Design and develop simple cryptography algorithms. | | | | | | | | | | | | | | |
| CO-3 | Analyze different digital signature algorithm and key management techniques for secure communication | | | | | | | | | | | | | | |
| CO-4 | Compare and examine different protocols used in Wireless LAN | | | | | | | | | | | | | | |
| CO-5 | Understand cyber security and cyber Law needs. | | | | | | | | | | | | | | |
| 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 | | 3 | | | | | | | | | | | 2 | | |
| CO4 | | | | 2 | | | | | | | | | 2 | | |
| CO5 | | | | | | 2 | | 2 | | | | | | | |
| Average | 2 | 3 | 1 | 2 | | 2 | | 2 | | | | | 2 | | |

| | | |
|--|--|----------------------------|
| Subject: Computer Graphics &Visualziation | | Subject Code:15CS62 |
| 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 | | | | 2 | | | | | | | | | | 1 |
| CO2 | 3 | 2 | | | 2 | | | | | | | | | | 2 |
| CO3 | 3 | | | | | | | | | | | | | | 1 |
| CO4 | 2 | 2 | | | | | | | | | | | | | 1 |
| CO5 | 3 | | | | 3 | | | | | | | | | | 1 |
| Average | 2.8 | 2 | | | 2.33 | | | | | | | | | | 1.2 |

| | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---------------------|----|----|------|---|---|
| Subject: System Software and compiler design | | | | | | | | | | Subject Code:15CS63 | | | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO1 | Analyze signals and perform various signal processing operations using DFT. | | | | | | | | | | | | | | |
| CO2 | Explain and Apply FFT algorithms for efficient computation of DFT and IDFT of a given sequence. | | | | | | | | | | | | | | |
| CO3 | Design of IIR analog and digital filters by using Butterworth and Chebyshev technique. | | | | | | | | | | | | | | |
| CO4 | Design of IIR digital filters by using impulse invariant technique and bilinear transformation technique. | | | | | | | | | | | | | | |
| CO5 | Design a digital IIR and FIR filter by using direct, cascade, parallel and linear phase methods of realization. | | | | | | | | | | | | | | |
| 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 | | 2 | | | | | | | | | | | | | |
| CO3 | | | | | | | | | | | | | | | 2 |
| CO4 | | | | 2 | | | | | | | | | | | |
| CO5 | | | | | 2 | | | | | | | | | | |
| Average | 2 | 2 | | 2 | 2 | | | | | | | | | | 2 |

| | | | | | | | | | | | | | | | |
|----------------------------|---|---|---|---|---|---|---|---|---|---------------------|----|----|------|---|---|
| Subject: Operating Systems | | | | | | | | | | Subject Code:15CS64 | | | | | |
| 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 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 | 2 | | | | | | | | | | | | 2 | | |
| CO2 | | 2 | | | | | | | | | | | | 2 | |
| CO3 | | 2 | | | | | | | | | | | | | |
| CO4 | | 2 | | | | | | | | | | | | | |
| CO5 | 2 | | 2 | | | | | | | | | | | | |
| Average | 2 | 2 | 2 | | | | | | | | | | 2 | 2 | |

| | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|----------------------------|--|--|--|--|--|
| Subject: Data mining data warehousing | | | | | | | | | | Subject Code:1CS651 | | | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | | understand the basic concepts of data mining and datawarehousing | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | |
|-------------------|---|---|---|---|---|---|---|---|---|----|----|----|------|---|---|
| CO-2 | Identify datamining Problems and implement the datawarehouse | | | | | | | | | | | | | | |
| 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 sloution for 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 | | | | | | | | | | | | | |
| CO3 | | | 3 | | | | | | | | | | | 2 | |
| CO4 | | | | 2 | | | | | | | | | | | |
| CO5 | | | | | 2 | | | | | | | | | | 2 |
| Average | 3 | 2 | 3 | 2 | 2 | | | | | | | | 2 | 2 | 2 |

| Subject: MOBILE APPLICATION DEVELOPMENT | | | | | | | | | | Subject Code:15CS661 | | | | | |
|---|---|---|---|---|---|---|---|---|---|----------------------|----|----|------|---|---|
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Create, test and debug Android application by setting up Android development environment. | | | | | | | | | | | | | | |
| CO-2 | Implement adaptive, responsive user interfaces that work across a wide range of devices. | | | | | | | | | | | | | | |
| CO-3 | Implement adaptive, responsive user interfaces that work across a wide range of devices. | | | | | | | | | | | | | | |
| CO-4 | Infer long running tasks and background work in Android applications. | | | | | | | | | | | | | | |
| CO-5 | Describe the steps involved in publishing Android application to share with the world. | | | | | | | | | | | | | | |
| CO-PO-PSO Mapping | | | | | | | | | | | | | | | |
| COs | POs | | | | | | | | | | | | PSOs | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| CO1 | | | 2 | | | | | | | | | | 1 | | |
| CO2 | | | 2 | 2 | | | | | | | | | 1 | | |
| CO3 | | | | 2 | | | | | | | | | 1 | | |
| CO4 | | | | | 2 | | | | | | | | 1 | | |
| CO5 | | | | | 2 | | | | | | | 1 | 1 | | 2 |
| Average | | | 2 | 2 | 2 | | | | | | | 1 | 1 | | 2 |

| Subject: PYTHON APPLICATION PROGRAMMING | | | | | | | | | | Subject Code:15CS664 | | | | | |
|---|---|---|---|---|---|---|---|---|---|----------------------|----|----|------|---|---|
| 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 | | 2 | 2 | | | | | | | | | | | | |
| CO2 | | | | 2 | | | | | | | | | | | |
| CO3 | | | | 2 | 2 | | | | | | | | | | |
| CO4 | | | | | | | | | | | | | 2 | | |
| CO5 | | | | | | 2 | | | | | | | 2 | | |
| Average | | 2 | 2 | 2 | 2 | 2 | | | | | | | 2 | | |

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,processsscheduling,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 | | | | | 3 | | | | | | | | 1 | | |
| CO2 | | | | 3 | | | | | | | | | 2 | | |
| CO3 | | | 3 | 3 | | | | | | | | | | | |
| Average | | | 3 | 3 | 3 | | | | | | | | 2 | | |

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 | 3 | | | | | | | | | | | | | | 2 |
| CO2 | | | 2 | | | | | | | | | | | | 1 |
| CO3 | | | 3 | | | | | | 3 | | 2 | 2 | | | 2 |
| Average | 3 | | 2.5 | | | | | | 3 | | 2 | 2 | | | 1.66 |

Semester-VII**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 |

Course Outcomes

| | |
|------|--|
| CO-1 | Explain the concepts of parallel computing and network technologies |
| CO-2 | Analyze the performance with respect to Power & cost. |
| CO-3 | Illustrate parallel algorithm for parallel architecture. |
| CO-4 | Understand the design issues relating to memory hierarchy and architecture. |
| CO-5 | Understand the programming concepts in context of computer system design & organization. |

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 | 1 | 1 | | | | | | | | | | 1 | | |
| CO4 | 3 | 1 | | | | | | | | | | | 1 | 1 | |
| CO5 | 2 | 1 | | | | | | | | | | 1 | 1 | | 1 |
| Average | 2.4 | 1 | 1 | | | | | | | | | 1 | 1.2 | 1 | 1 |

Course Outcomes

| | |
|------|---|
| CO-1 | Understand the basic concepts of Machine learning and Its types |
| CO-2 | Identify optimal techniques suitable for a given problem |
| CO-3 | Illustrate learning algorithms |
| CO-4 | Apply machine learning technique towards real world data analysis |
| CO-5 | Design an application using machine learning 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 | 2.33 | 2.33 | 3 | 1 | 2 | 2 | | | | | | 1.33 | 1.6 | 2 | 1.66 |

Course Outcomes

| | |
|------|---|
| CO-1 | Review the unix kernel structure and system call |
| CO-2 | Apply unix APIs to demonstrate the working of the file system |
| CO-3 | Make use of various APIs to create , handle and control the processes in unix environment |
| CO-4 | Analyze unix kernel support for signals and daemon processes.. |
| CO-5 | Interpret the different mechanisms for interprocess communication. |

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 | 2 | 1 | | | | | | | | | | 2 | 2 | |
| CO3 | 2 | 2 | | | | | | | | | | | | 2 | |
| CO4 | 2 | 2 | | | | | | | | | | | | 2 | |
| CO5 | 2 | 2 | 2 | | | | | | | | | | 2 | | |
| Average | 2.2 | 1.8 | 1.5 | | | | | | | | | | 2 | 2 | |

Subject: Storage Area Networks**Subject Code:15CS754****Course Outcomes**

| | |
|------|--|
| CO-1 | Identify key challenges in managing information along with RAID implementations. |
| CO-2 | Describe different storage networking technologies and virtualization. |
| CO-3 | Illustrate backup, archive and replication. Explain components and the implementations of NAS. |
| CO-4 | Determining different cloud computing deployment models, service models and infrastructure components. |
| CO-5 | 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 |

Subject: Machine Learning Laboratory**Subject Code:15CSL76****Course Outcomes**

| | |
|------|--|
| CO-1 | Explore various python libraries useful for real-time application and choose appropriate data sets to the Machine Learning algorithms. |
| CO-2 | Understand the implementation procedures for the machine learning algorithms |
| CO-3 | Identify and apply Machine Learning 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 | 2 | 2 | | | | | | | | | | 2 | | |
| CO2 | | | | | 2 | 1 | | | | | | | 2 | | |
| CO3 | 1 | 2 | 2 | | | | | | | | | 2 | 2 | 2 | 2 |
| Average | 1.5 | 2 | 2 | | 2 | 1 | | | | | | 2 | 2 | 2 | 2 |

Subject: Web Technology Laboratory With Mini Project**Subject Code:15CSL77****Course Outcomes**

| | |
|------|--|
| CO-1 | Understand and Adapt HTML and CSS syntax and semantics to Design and develop dynamic web pages with good aesthetic sense |
| CO-2 | understanding of Web Application Terminologies, Internet Tools other web services |
| CO-3 | Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically. Learn how to link and publish web sites |

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 | 2 | |
| CO2 | 2 | 2 | 2 | | 2 | | | | | | | | 2 | 2 | |
| CO3 | 2 | 2 | 2 | 2 | 2 | 1 | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Average | 2.33 | 2.33 | 2 | 2 | 2 | 1 | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

Subject: Project Work Phase I**Subject Code:15CSP78****Course Outcomes**

| | |
|------|--|
| CO-1 | Gain knowledge on societal real time problems and identify innovation required |
|------|--|

| | | | | | | | | | | | | | | | |
|-------------------|--|-----|---|---|---|---|---|---|---|----|----|------|------|---|---|
| CO-2 | Undertake identified problems statement in different domains | | | | | | | | | | | | | | |
| CO-3 | Analyse the problem statement through literature survey | | | | | | | | | | | | | | |
| CO-4 | Formulation of designing Process | | | | | | | | | | | | | | |
| CO-5 | 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 | |

Semester-VIII

| Subject: Internet of Things & Application | | | | | | | | | | Subject Code:15CS81 | | | | | |
|---|--|------|---|---|---|---|---|---|---|---------------------|----|----|------|---|---|
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Interpret the impact and Challenges posed by IoT networks leading to new Architectural models | | | | | | | | | | | | | | |
| CO-2 | Compare and Contrast the depoloyment of smart objects and the technologies to connect them to network | | | | | | | | | | | | | | |
| CO-3 | Apprasie the role of IoT protocols for efficient network communication | | | | | | | | | | | | | | |
| CO-4 | Eloborate the need of Data Analytics and its security in IoT | | | | | | | | | | | | | | |
| CO-5 | 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: Big Data Analytics | | | | | | | | | | Subject Code:15CS82 | | | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Understand the concepts of HDFS and map reduce framework | | | | | | | | | | | | | | |
| CO-2 | Investigate hadoop related tools for Big data Analytics and perform basic hadoop administration. | | | | | | | | | | | | | | |
| CO-3 | Recognize the role of business Intelligence, data ware housing and visualization in decision making. | | | | | | | | | | | | | | |
| CO-4 | Infer the importance of core data mining techniques for data analytics. | | | | | | | | | | | | | | |
| CO-5 | Compare and contrast different text mining web mining, naïve bayes analysis, support vector machines and social network analysis. | | | | | | | | | | | | | | |
| 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 | 2 | 2 | | | 1 | | | | | | | | 2 | 2 | 3 |
| CO3 | 2 | | | | | | | | | | | 1 | 2 | | 2 |
| CO4 | 2 | 2 | 2 | | | 2 | | | | | | | 2 | | 3 |

| | | | | | | | | | | | | | | | |
|----------------|-----|---|---|--|---|---|--|--|--|--|--|---|---|---|-----|
| CO5 | 3 | 2 | 2 | | | | | | | | | 1 | 2 | | 2 |
| Average | 2.4 | 2 | 2 | | 1 | 2 | | | | | | 1 | 2 | 2 | 2.2 |

| | | | | | | | | | | | | | | | |
|--|---|---|-----|---|---|---|---|---|---|----------------------|-----|----|------|------|---|
| Subject: System Modelling And Simulation | | | | | | | | | | Subject Code:15CS834 | | | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Identify the role of important elements of discrete even simulation and modeling paradigm in real world | | | | | | | | | | | | | | |
| CO-2 | Describe the various distribution models and analyze various queuing models | | | | | | | | | | | | | | |
| CO-3 | Examine and apply techniques for generating random numbers and random variants. | | | | | | | | | | | | | | |
| CO-4 | Judge appropriate method for data collection and testing methods | | | | | | | | | | | | | | |
| CO-5 | Sketch the model and apply the results to solve critical issues in a real world environment | | | | | | | | | | | | | | |
| 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 | | 3 |
| CO2 | 1 | 2 | | 2 | | | | | | | 2 | | | 2 | |
| CO3 | | | | | 1 | | | | | | | | | 3 | |
| CO4 | | | 2 | | | | 3 | | | | | | 1 | | |
| CO5 | | | 3 | 2 | | | | | | | 3 | | | 2 | |
| Average | 2 | 2 | 2.5 | 2 | 1 | | 3 | | | | 2.5 | 2 | 1.5 | 2.33 | 3 |

| | | | | | | | | | | | | | | | |
|---------------------|--|-----|---|---|---|---|---|---|---|----|----|---------------------|------|------|------|
| Subject: Internship | | | | | | | | | | | | Subject Code:15CS84 | | | |
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Identify and apply the problem using engineering knowledge | | | | | | | | | | | | | | |
| CO-2 | Design and implement new concepts in multidisciplinary area. | | | | | | | | | | | | | | |
| CO-3 | Explore career alternatives prior to graduation in different domains | | | | | | | | | | | | | | |
| CO-4 | Demonstrate professional and ethical practice | | | | | | | | | | | | | | |
| CO-5 | 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 |


| Subject: Project Work Phase II | | | | | | | | | | | Subject Code:15CSP85 | | | | |
|--------------------------------|---|---|---|---|---|---|---|---|---|----|----------------------|----|------|---|---|
| Course Outcomes | | | | | | | | | | | | | | | |
| CO-1 | Design engineering solution to complex problems utilizing a system approach using modern tools | | | | | | | | | | | | | | |
| CO-2 | Communicate with peers, supervisor engineers and society | | | | | | | | | | | | | | |
| CO-3 | Implement the innovative designed work and conduct performance analysis using engineering project principles. | | | | | | | | | | | | | | |
| CO-4 | Demonstrate the work done and knowledge gained in completed work | | | | | | | | | | | | | | |
| CO-5 | 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 |
| 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 |

| | |
|------------------|----------------------|
| Subject: Seminar | Subject Code:15CSS86 |
|------------------|----------------------|

| Course Outcomes | |
|-----------------|--|
| CO-1 | Identify and Analyze information about emerging technologies with respect to current trends. |
| CO-2 | Identify promising new directions of various cutting edge technologies with intrapersonal skills. |
| CO-3 | Communicate effectively to a diverse audience, exhibit effective communication skills. |
| CO-4 | Students should discuss appropriate modern engineering and IT Tools in new innovations and inventions. |
| CO-5 | 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 | | |



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