ADITYA ENGINEERING COLLEGE

An Autonomous Institutuion

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Recognised by UGC under sections 2(f) and 12(B) of UGC Act, 1956

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Department of Information Technology

B.Tech - AR20 - Course Articulation Matrix

Note: Correlation Levels are 1 or 2 or 3. Where 1 Slight(Low), 2 Moderate(Medium), 3 Substantial (High).

	CO Statements	POs												PSOs	
I SEM															
Course Code	**201HS1T01 - Communicative English**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify the ways to overcome fear and use of words paradoxically, interpret the developing conditions and the core competences of the state to prioritize education system.	-	-	-	-	-	-	1	-	-	3	-	-	-	-
CO2	Explain about world's most precious natural resources.	-	-	-	-	-	-	1	-	-	3	-	-	-	-
CO3	Explain about importance of unity to abolish war.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO4	Respond well to the changing situations in life with independent knowledge for better decision making.	-	-	-	-	-	-	-	-	2	3	-	2	-	-
CO5	Demonstrate writing and concepts of effective writing skills.	-	-	-	-	-	-	-	-	1	3	-	-	-	-
Course Code	**201BS1T01 - Differential Equations and Linear algebra**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply the concepts of Mean Value theorem, Partial Differentiation and identify the maxima and minima of a given function.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Solve the linear differential equations and model various situations involving differential equations of first order.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Solve linear differential equations of higher order and model various situations involving second order differential equations.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Calculate Rank of a matrix and solve the system of Linear equations and find the Eigen values and Eigen vectors.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Compute various powers of a matrix and identify the nature of the quadratic form.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**201BS1T04 - Engineering Chemistry**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Compare the quality of drinking water and problems associated with hard water.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Explain the fundamentals and applications of Electrochemical Energy Systems.	2	-	-	-	-	-	-	-	-	-	-	-	1	-
CO3	Explain the fundamentals and applications of Advance materials.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Explain about renewable energy sources and their manufacturing methods	2	-	-	-	-	-	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
CO5	Summarize the importance of Nano materials and Green chemistry.	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**201ES1T02 - Programming for Problem Solving using C**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop the basic programs in C and draw the flowcharts using Raptor.	**2**	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**
CO2	Make use of control structures and arrays in solving complex problems.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**
CO3	Apply the concept of modularity and strings to handle complex problems.	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**
CO4	Apply the dynamic memory allocation functions using pointers.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**
CO5	Solve real world problems using the concept of structures, unions and File operations.	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**3**	**-**
Course Code	**201ES1I02 - Computer Engineering Workshop**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify the components of a PC, Assemble & disassemble the same.	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**
CO2	Experiment with installation of Linux Operating System, Virtual machine and secure a computer from cyber threats	**3**	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**
CO3	Summarize the fundamentals and architecture of IoT.	**3**	**-**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**
CO4	Prepare word documents; excel sheets and power point presentation	**2**	**1**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**
CO5	Develop presentation /documentation using Office tools and Latex.	**3**	**2**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**
Course Code	**201HS1L01 - Communicative English Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of the concepts to communicate confidently and competently in English Language in all spheres.	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**3**	**-**	**1**	**-**	**-**
CO2	Express Creative skills to construct Dialogues / Conversations in Spoken and Written forms.	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**3**	**-**	**2**	**-**	**-**
CO3	Identify Accent for intelligibility.	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**3**	**-**	**2**	**-**	**-**
CO4	Demonstrate communicative ability in everyday Conversation, JAM Sessions and Public Speaking.	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**3**	**-**	**1**	**-**	**-**
CO5	Demonstrate nuances of Language through Audio – Visual Experience and group activities.	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**3**	**-**	**1**	**-**	**-**
Course Code	**201BS1L03 - Engineering Chemistry Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate Complex metric titrations by volumetric analysis.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**1**	**-**	**-**
CO2	Demonstrate Acid – Base titrations by instrumental analysis.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**1**	**-**	**-**
CO3	Estimate Vitamin C using volumetric analysis	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**1**	**-**	**-**
CO4	Prepare polymer like Bakelite.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**1**	**1**	**-**
CO5	Prepare alternative fuel like Bio-Diesel.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**1**	**-**	**-**

	CO Statements	POs												PSOs	
Course Code	**201ES1L02 - Programming for Problem Solving using C Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop the basic programs in C and draw the flowcharts using Raptor.	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**2**	**-**
CO2	Make use of control structures and arrays in solving complex problems.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**3**	**-**
CO3	Apply the concept of modularity and strings to handle complex problems.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**3**	**-**
CO4	Apply the dynamic memory allocation functions using pointers.	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**1**	**2**	**-**
CO5	Solve real world problems using the concept of structures, unions and File operations.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**3**	**-**
Course Code	**201MC1T01 - Environmental Science**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Outline the natural resources and their importance for the sustenance of the life	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Explain about the biodiversity of India, threats and its conservation methods	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Illustrate various attributes of the pollution, impacts and measures to control the pollution along with waste management practices	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Describe social issues of both rural and urban environment to combat the challenges and the legislations of India in environmental protection	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Explain the population growth and its implications	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	II SEM														
Course Code	**201BS2T07 - Numerical Methods and Complex Variables**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply numerical methods to obtain approximate solution of equations.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Apply various numerical methods to interpolate polynomials.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Apply numerical methods to initial value problems and problems involving integration.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Identify the analyticity of functions of complex variables.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Apply Cauchy's theorem, Cauchy's integral formula and Cauchy's residue theorem.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**201BS2T09 - Applied Physics**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply the principles of interference and diffraction to design and enhance the resolving power of various optical instruments	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Explain the fundamental concepts of Quantum behavior of matter.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Classify the solids based on energy band structure.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Explain the basic concepts of Semi-Conductors and Identify the type of semiconductors using Hall Effect.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Explain about magnetic and dielectric properties of different materials.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

	CO Statements	POs												PSOs	
Course Code	**201ES2T11 - Computer Organization**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Recognize and manipulate representations of numbers stored in digital computers.	3	2	-	-	3	-	-	-	-	-	-	-	1	-
CO2	Relate Postulates of Boolean algebra and minimize combinational functions.	2	1	-	-	2	-	-	-	-	-	-	-	2	-
CO3	Make Use of combinational and sequential circuits with simplified logic functions in various digital circuits.	3	2	1	1	2	-	-	-	-	-	-	-	2	-
CO4	Explain the Basic Computer Organization and Design	2	1	-	-	2	-	-	-	-	-	-	-	2	-
CO5	Describe the internal organization of computers, CPU, memory unit and Input/Outputs and the relations between its main components.	2	1	-	-	2	-	-	-	-	-	-	-	2	-
Course Code	**201ES2T04 - Python Programming**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop programs using fundamental concepts in python	-	2	3	-	2	-	-	-	-	-	-	2	2	-
CO2	Solve problems using control statements and string methods	-	2	3	-	2	-	-	-	-	-	-	2	3	-
CO3	Develop real time applications using data structures and functions	-	3	2	-	2	-	-	-	-	-	-	2	2	-
CO4	Apply Object Oriented Programming concepts and files	-	3	2	-	2	-	-	-	-	-	-	2	2	-
CO5	Build various applications using GUI and exceptions.	-	1	2	-	3	-	-	-	-	-	-	2	1	-
Course Code	**201ES2T07 - Data Structures through C**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Illustrate time and space complexities of an algorithm.	-	3	2	2	-	-	-	-	-	-	-	1	2	-
CO2	Apply various searching and sorting techniques to solve computing problems.	-	2	2	3	-	-	-	-	-	-	-	1	3	-
CO3	Make use of linear data structures to solve real time problems.	-	3	2	2	-	-	-	-	-	-	-	1	3	-
CO4	Develop applications using Tree Data Structures.	-	2	2	3	-	-	-	-	-	-	-	1	3	-
CO5	Solve problems using Graph Algorithms.	-	3	2	2	-	-	-	-	-	-	-	1	3	-
Course Code	**201BS2L04 - Applied Physics Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Use spectrometer, travelling microscope for making measurements	3	2	-	-	-	-	-	-	3	-	-	1	-	-
CO2	Determine energy gap of a semiconductor, draw characteristic curves to estimate thermal coefficient of a thermistor, Zener diode.	2	2	-	-	-	-	-	-	3	-	-	1	-	-
CO3	Determine the dielectric constant and resistivity.	3	1	-	-	-	-	-	-	3	-	-	1	-	-
CO4	Determine wavelength of source and width of the narrow slits.	3	2	-	-	-	-	-	-	3	-	-	1	-	-
CO5	Find the strength of magnetic field.	3	2	-	-	-	-	-	-	3	-	-	1	-	-
Course Code	**201ES2L06 - Data Structures through C Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop programs using recursive functions.	-	3	2	2	-	-	-	-	-	-	-	1	2	-
CO2	Apply various searching and sorting techniques to solve computing problems.	-	2	2	3	-	-	-	-	-	-	-	1	2	-
CO3	Develop programs for implementing various operations on linear data structures.	-	3	2	2	-	-	-	-	-	-	-	1	2	-
CO4	Analyze various basic operations of Binary tree and Binary search tree to improve the efficiency.	-	2	2	3	-	-	-	-	-	-	-	1	2	-
CO5	Develop solution for problems using Graph Algorithms.	-	3	2	2	-	-	-	-	-	-	-	1	2	-

	CO Statements	POs												PSOs	
Course Code	**201ES2L14 - Python Programming Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop programs using conditional and iterative statements	-	2	3	-	2	-	-	-	-	-	-	2	1	-
CO2	Make use of different data structures in solving complex problems.	-	2	3	-	2	-	-	-	-	-	-	2	3	-
CO3	Apply the concepts of functions and files in solving real time applications	-	2	2	-	3	-	-	-	-	-	-	2	2	-
CO4	Build applications for handling exceptions.	-	1	2	-	3	-	-	-	-	-	-	2	2	-
CO5	Develop GUI applications.	-	1	2	-	3	-	-	-	-	-	-	2	2	-
Course Code	**201MC2L01 - Professional Communication Skills Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make effective use of Body language in all situations and contexts to enhance effective communication in all aspects.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
CO2	Identify communicative competency to respond to others in different situations.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
CO3	Make use of effective delivery strategies to select, compile and synthesize information for oral presentation.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
CO4	Demonstrate in mock interviews, group discussion and public speaking.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
CO5	Illustrate interpersonal skills using English language confidently and effectively for personal and professional growth.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
Course Code	**201MC2T02 - Constitution of India**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain historical background of the constitution making and its importance for building a democratic India.	-	-	-	-	-	1	-	-	-	-	-	-	-	-
CO2	Compare the functioning of three wings of the government i.e., executive, legislative and judiciary.	-	-	-	-	-	1	-	-	-	-	-	-	-	-
CO3	Interpret the value of the fundamental rights and duties for becoming good citizen of India.	-	-	-	-	-	1	-	-	-	-	-	-	-	-
CO4	Compare the decentralization of power between central, state and local self- government.	-	-	-	-	-	1	-	-	-	-	-	-	-	-
CO5	Extend the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.	-	-	-	-	-	1	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
		III SEM													
Course Code	**201CS3T01-Advanced Data Structures**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate the External Sorting and Hashing.	**3**	**2**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Illustrate the concepts of Priority Queues.	**2**	**2**	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Analyze the Efficient Binary Search trees and Multiway Search Trees.	**3**	**1**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Compare the Digital Search Structures.	**3**	**2**	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Apply the String Matching Algorithms to real time applications.	**2**	**1**	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**201CS3T02-Object Oriented Programming Through C++**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Compare and Contrast object oriented programming and procedural oriented programming.	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Summarize the OOPS concepts.	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Make use of constructor and destructor to initialize and destroy class objects.	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Apply C++ features such as composition of objects, this pointer, operator overloading, exception handling , compile time and runtime polymorphism.	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Apply inheritance to build real time application..	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Design C++ classes with templates and STL.	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**201CS3T03-Operating Systems**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Illustrate the basic structure, services, system calls and architectural components of Operating Systems.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Analyze various Process Scheduling algorithms and Multi threading models.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	Demonstrate Inter Process Communication between the processes and deadlocks.	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Make use of paging, segmentation and virtual memory strategies to allocate memory for the process.	**1**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Describe the concepts of file system implementation, disk management, Protection and security for system.	**1**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**201CS3T04-Software Engineering**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the key facts, concepts, principles, and theories of software & Software Engineering.	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**
CO2	Compare various software development process models with respective to advantages, disadvantages and applicability.	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**
CO3	Describe the various responsibilities and activities of Software Project Management.	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**2**	**-**
CO4	Prepare SRS Document for any real time scenario.	**2**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
CO5	Apply various Design, Coding and testing Principles for developing the software products.	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**
Course Code	**201BS3T13-Discrete Mathematics**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply the principles of mathematical logic to statement calculus and predicate calculus.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Compute Transitive closure, equivalence classes of binary relations.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Solve recurrence relations by various methods.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Apply the concepts of graph theory to find euler paths, Hamiltonian paths.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Apply the concepts of graph theory to trees.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**201CS3L01-Object Oriented Programming Through C++ Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Use Control Structures and modular programming in solving complex problems.	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**-**	**-**	**2**	**-**
CO2	Apply object oriented techniques to solve computing problems.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**3**	**-**
CO3	Develop C++ classes for code reuse through inheritance.	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**3**	**-**
CO4	Apply exception handling technique to handle various errors.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**3**	**-**
CO5	Develop C++ programs using Inline, friend functions, Reference variable, this pointer, operator Overloading, static and dynamic binding, template and STL	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
Course Code	**201CS3L02-Operating Systems Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Illustrate various process scheduling algorithms.	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**-**	**-**	**2**	**-**
CO2	Experiment with various system calls and deadlock algorithm.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**3**	**-**
CO3	Develop algorithms for memory management.	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**2**	**-**
CO4	Explain Page replacement algorithms and file allocation strategies.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**2**	**-**
CO5	Make use of Pthread library for thread concurrent execution.	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**3**	**-**	**-**	**2**	**-**
Course Code	**201CS3L03-Unix and Shell Programming Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of Unix utilities and perform basic shell control operations on theUnix utilities.	**2**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Make use of various commands in UNIX to control various resources likefile, network, disk etc.	**2**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Develop Shell Script using Shell commands.	**3**	**2**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**
CO4	Construct AWK Script using AWK commands.	**2**	**2**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**
CO5	Apply system calls for File Management, Process Management and IPC	**2**	**2**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
Course Code	**201SC3L05-Applications Of Python -Numpy (Skill Oriented Course- I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain how data is collected, managed and stored for processing	-	3	-	2	2	-	-	-	-	-	-	1	-	2
CO2	Analyze the workings of various numerical techniques, different descriptive measures of Statistics, correlation and regression to solve theengineering problems.	-	2	-	2	3	-	-	-	-	-	-	2	-	2
CO3	Apply some linear algebra operations to n-dimensional arrays.	-	2	-	3	2	-	-	-	-	-	-	2	-	2
CO4	Develop common data wrangling tasks using NumPy in Python.	-	2	-	2	3	-	-	-	-	-	-	2	-	2
CO5	Develop common data computational tasks in Python.	-	2	-	3	2	-	-	-	-	-	-	2	-	2
Course Code	**201SC3L06-Web Application Development Using Full Stack Frontend Development – Module –I (Skill Oriented Course- I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of HTML tags, elements and their attributes for designing static web pages.	-	2	2	-	1	-	-	-	-	-	-	1	2	-
CO2	Experiment with tables to align data and hyperlinks for interactive web pages.	-	2	3	-	2	-	-	-	-	-	-	1	2	-
CO3	Apply form elements for developing Registration and Login webpages.	-	2	2	-	2	-	-	-	-	-	-	1	2	-
CO4	Build a web page by applying appropriate CSS styles to HTML elements.	-	3	3	-	2	-	-	-	-	-	-	1	2	-
CO5	Develop any real time web site using the core concepts of HTML5 and CSS3 along with media.	-	3	3	-	2	-	-	-	-	-	-	1	2	-
Course Code	**201MC3T03-Biology For Engineers**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply biological engineering principles, procedures needed to solve real-world problems.	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Demonstrate the fundamentals of living things, their classification, cell structure and biochemical constituents.	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Apply the concept of plant, animal and microbial systems and growth in real life Situations.	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Explain genetics and the immune system to know the cause, symptoms, diagnosis and treatment of common diseases.	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Demonstrate basic knowledge of the applications of biological systems in relevant industries.	1	-	-	-	-	-	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
IV SEM															
Course Code	**201BS4T16-Probability and statistics**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Compute mean, median, mode, standard deviation and variance.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Apply various Probability distributions for both discrete and continuous random variables.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Compute mean and variance of sample means with replacement and without replacement and estimating maximum errors.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Apply various tests to test the hypothesis concerning mean, Proportion, variance.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Apply the concepts of correlation and regression to the given statistical data.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**201CS4T05-Formal Languages and Automata Theory**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the basic concepts of automaton and its properties.	**3**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Apply interconversion of regular expression and finite automata.	**1**	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	Design grammars to produce strings from a specific language.	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Construct automaton for a given problem.	**1**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Analyze decidability and undecidability problems.	**2**	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**201CS4T06-Database Management Systems**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Summarize the database characteristics and identify various databasearchitectures.	**3**	**-**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Interpret relational database using SQL.	**1**	**-**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Examine issues in data storage and query processing for appropriatesolutions.	**1**	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Make use of normalization techniques for database design.	**2**	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Illustrate the mechanisms of transaction management.	**2**	**3**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**201CS4T07-Java Programming**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply object oriented programming features and concepts for solving given problem.	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Solve real time problems using the concepts of class, inheritance, interface and packages.	**2**	**2**	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Test for runtime exceptions arise in java applications.	**2**	**2**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Develop real time applications using multithreading.	**2**	**1**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Build java applications that interact with database for performing data related operations.	**2**	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**201HS4T03-Managerial Economics And Financial Analysis**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the Managerial Economic concepts for decision making and forward planning.	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**

	CO Statements	POs												PSOs	
CO2	Illustrate the law of demand and its exceptions, to use different forecasting methods for predicting demand for various products and services.	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**1**	**-**	**-**	**1**
CO3	Identify the cost behavior, costs useful for managerial decision making and Break Even Point (BEP) of an enterprise.	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**1**	**-**	**1**
CO4	Outline the different types of business organizations along with basic knowledge on business cycle.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**
CO5	Make use of the process & principles of accounting and prepare Journal, Ledger, Trial Balance, Trading A/c., Profit & Loss A/c. and Balance Sheet of an enterprise.	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**3**	**-**	**1**	**-**	**-**
Course Code	**201CS4L04-Database Management Systems Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of the concepts of relational model techniques for databasedesign.	**-**	**2**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Construct a database schema for a given problem-domain.	**-**	**2**	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Apply Normalization techniques on a database to avoid anomalies.	**-**	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Build queries on a database using SQL DDL/DML commands.	**-**	**2**	**2**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Develop PL/SQL stored procedures, stored functions, cursors and packages.	**-**	**3**	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**201CS4L05-Java Programming Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of class, inheritance, interface and packages to develop solutions for complex problems.	**1**	**1**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Develop error-handling techniques using exception handling.	**2**	**3**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Build java applications using Threads.	**2**	**1**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Apply event handling to create interactive applications.	**2**	**1**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Build applications using JDBC connectivity.	**2**	**1**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**201CS4L06-R Programming Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of online resources for R and import new function packages into the R workspace.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Import, review, manipulate and summarize data-sets in R.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Explore data-sets to create testable hypotheses and identify appropriate	**3**	**2**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Apply appropriate statistical tests using R.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Design and edit visualizations with R.	**-**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**
Course Code	**201SC4L18-Applications Of Python-Pandas (Skill Oriented Course- II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Use Pandas to create and manipulate data structures like Series andDataFrames.	**-**	**3**	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**2**
CO2	Experiment with arrays, queries, and dataframes	**-**	**2**	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**
CO3	Apply dataframe structures for cleaning and processing data.	**-**	**2**	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**

	CO Statements	POs												PSOs	
CO4	Apply dataframe structures for manipulatingfiles.	-	2	-	2	3	-	-	-	-	-	-	2	-	2
CO5	Develop basic charts to display data from data frames.	-	2	-	3	2	-	-	-	-	-	-	2	-	2
Course Code	**201SC4L19-Web Application Development Using Full Stack Frontend Development module – 2 (Skill Oriented Course- II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Build a web page by embedding JavaScript to invoke programming ability.	-	2	2	-	2	-	-	-	-	-	-	2	2	-
CO2	Make use of Pre-defined JavaScript objects properties and methods	-	2	2	-	2	-	-	-	-	-	-	2	2	-
CO3	Experiment with JavaScript to develop dynamic web pages and validate forms.	-	3	3	-	3	-	-	-	-	-	-	2	2	-
CO4	Choose the appropriate properties and methods to design custom objects.	-	3	3	-	3	-	-	-	-	-	-	2	2	-
CO5	Develop applications using the event handling in JavaScript.	-	3	3	-	3	-	-	-	-	-	-	2	2	-
Course Code	**201MC4T04-Essence Of Indian Traditional Knowledge**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify the concept of Traditional knowledge and its importance.	-	-	-	-	-	1	1	-	-	-	-	-	-	-
CO2	Explain the need and importance of protecting traditional knowledge.	-	-	-	-	-	1	1	-	-	-	-	-	-	-
CO3	Illustrate the various enactments related to the protection of traditional knowledge	-	-	-	-	-	1	1	-	-	-	-	-	-	-
CO4	Interpret the concepts of Intellectual property to protect the traditional knowledge.	-	-	-	-	-	1	1	-	-	-	-	-	-	-
CO5	Explain the importance of Traditional knowledge in Agriculture and Medicine.	-	-	-	-	-	1	1	-	-	-	-	-	-	-
Course Code	**201CS4H01-Soft Computing Techniques (Honors Program)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify the difference between Conventional Artificial Intelligence to Computational Intelligence.	3	2	-	-	-	-	-	-	-	-	-	-	2	-
CO2	Apply fuzzy logic and reasoning to handle and solve engineering problems	2	3	2	2	-	-	-	-	-	-	-	-	3	-
CO3	Describe the advanced neural networks and its applications	2	1	-	-	-	-	-	-	-	-	-	-	2	-
CO4	Perform various operations of genetic algorithms, Rough Sets.	2	2	2	3	-	-	-	-	-	-	-	-	2	-
CO5	Comprehend various techniques to build model for various applications	2	1	2	3	-	-	-	-	-	-	-	-	2	-

	CO Statements	POs												PSOs	
Course Code	**201CS4H02-Internet Of Things (Honors Program)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain in a concise manner how the general Internet as well as Internet of Things work.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Understand constraints and opportunities of wireless and mobile networks for Internet of Things.	**2**	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Use basic sensing and measurement and tools to determine the real-time performance of network of devices.	**2**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Develop prototype models for various applications using IoT technology	**2**	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Explain in a concise manner how the general Internet as well as Internet of Things work	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**201CS4M01-Data Structures (Minor Program)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Illustrate time and space complexities of an algorithm.	**-**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**
CO2	Apply various searching and sorting techniques to solve computing problems.	**-**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**3**	**-**
CO3	Make use of linear data structures to solve real time problems.	**-**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**3**	**-**
CO4	Develop applications using Tree Data Structures.	**-**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**3**	**-**
CO5	Solve problems using Graph Algorithms.	**-**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**3**	**-**
Course Code	**201CS4M02-Software Engineering (Minor Program)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the key facts, concepts, principles, and theories of software & Software Engineering.	**-**	**-**	**2**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**
CO2	Compare various software development process models with respective to advantages, disadvantages and applicability.	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**
CO3	Describe the various responsibilities and activities of Software Project Management.	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**2**	**-**
CO4	Prepare SRS Document for any real time scenario.	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**
CO5	Apply various Designs, Coding and testing Principles for developing the software products.	**2**	**2**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**
Course Code	**201CS4M03- Computer Organization and Architecture (Minor Program)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe the basic structure of a computer system, various number systems and arithmetic operations.	**2**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Explain the Operation of CPUs including RTL, ALU, Instruction Cycle and Buses	**2**	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Demonstrate the architecture and functionality of central processing unit	**2**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Illustrate the I/O and memory organization in an efficient way.	**2**	**1**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Make use of multi processors and pipelining to improve the efficiency of computer system.	**2**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**