ADITYA ENGINEERING COLLEGE

An Autonomous Institutuion

Approved by AICTE • Permanently Affiliated to JNTUK • Accredited by NAAC with 'A' Grade

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Department of Information Technology

B.Tech - AR17 - 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	**171HS1T01 - English - I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Summarize how Gandhi grew in introspection and the conditions to achieve a higher quality of life, strength and sovereignty of a developed nation.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO2	Identify that all men can come together and avert the peril.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO3	Comprehend texts from a literary perspective and familiarize the students with Figures of Speech.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO4	Explain the characteristic traits of renowned scientists who contributed enormously to the scientific advancement of India.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO5	Demonstrate Writing and basic concepts of Grammar skills.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
Course Code	**171BS1T01- Mathematics – I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Associate linear differential equations of first order to various physical problems involving differential equations of first order	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Solve linear differential equations of higher order.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Solve linear systems of equations using the concept of rank, Gauss elimination, Gauss seidal method.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Find the eigen values and eigen vectors.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Associate the concepts of Partial Differentiation to maxima and minima of functions of several variables and to Partial differential equations.	3	2	-	-	-	-	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
Course Code	**171BS1T02 - Mathematics - II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply various numerical methods to find roots of equations and interpolating polynomials.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Apply numerical methods to initial value problems and problems involving integration.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Find the Fourier series of a given function and study the convergence of the series.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Find the Fourier transforms for given functions.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Apply method of separation of variables to solve one dimensional heat equation and wave equation and two dimensional laplace equations.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171BS1T04 - Applied Physics**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of the basic concepts of interference and relate to the principle of interferometer.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Relate the basic concepts of diffraction to illustrate the principle of optical instruments like Telescope & microscope.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Explain the basic concepts of polarization, principle of polarimeter and the method of producing high intensity light beams.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Interpret the wave nature of microscopic particles by using quantum mechanics and explain the electrical conductivity of materials.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Explain the behaviour of materials and be able to classify them using the band theory of solids and the basic concepts of semiconductors.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171ES1T03 - Engineering Drawing**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Sketch the polygons, conics and scales by using the principles of drawing.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Draw Orthographic projections of points and lines.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Draw Orthographic projections of planes in various positions.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Draw Orthographic projections of solids in various positions.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Construct isometric scale and isometric projections.	**3**	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**
CO6	Convert isometric view in to orthographic views.	**3**	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**
Course Code	**171ES1T01 -Computer Programming**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply Fundamental concepts of C for mathematical and scientific problems	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Use Control Structures and Arrays in solving complex problems.	**1**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
CO3	Develop modular programs to solve problems using control structures, Arrays and strings.	**1**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Demonstrate the pointers concept for allocating and deallocating memory dynamically.	**1**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Solve real world problems using the concept of file, structures and unions.	**1**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171HS1L01 - English Communication Skills Lab - I**	**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	**171BS1L04- Applied Physics Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Use spectrometer, polarimeter, 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 thermsitor, zener diode.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**1**	**-**	**-**
CO3	Determine the rigidity and determine frequency of an unknown electric vibrator.	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**1**	**-**	**-**
CO4	Determine wavelength of unknown source, the width of narrow slits, spacing Between close rulings using lasers and appreciate the accuracy in measurements.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**1**	**-**	**-**
CO5	Verify magnetic field along the axis of a circular coil.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**1**	**-**	**-**
Course Code	**171ES1L01 - Computer Programming Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Implement basic programs in C.	**-**	**2**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Use Conditional and Iterative statements to solve real time scenarios in C.	**-**	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Implement the concept of Arrays and Modularity.	**-**	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Apply the Dynamic Memory Allocation functions using pointers.	**-**	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Develop programs using structures, and Files.	**-**	**2**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

	CO Statements	POs												PSOs	
		II SEM													
Course Code	**171HS2T03 - English – II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Compare the difference between traditional and modern technologies.	-	-	-	-	1	-	-	-	-	3	-	-	-	-
CO2	Identify the causes for climate change.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO3	Infer professional work habits, necessary for effective collaboration and cooperation.	-	-	-	-	-	-	1	-	-	3	-	-	-	-
CO4	Develop competency in writing for political, social and religious documents.	-	-	-	-	-	-	1	-	-	3	-	-	-	-
CO5	Demonstrate writing and basic concepts of grammar skills.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
Course Code	**171BS2T06- Mathematics – III**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Compute Laplace transform of various functions.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Apply Laplace transform to solve initial value problems.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Discuss about beta and gamma function, double integral over a region and triple integral over a volume.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Find the gradient of a scalar function, divergence and curl of a vector function.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Apply line, surface and volume integrals to find work done by a force, flux.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171HS2T02- Environmental Studies**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify the need for protecting the producers and consumers in various ecosystems and their role in the food web.	-	-	-	-	-	1	3	-	-	-	-	-	-	-
CO2	Outline the natural resources and their importance for the sustenance of the life.	-	-	-	-	-	2	3	-	-	-	-	-	-	-
CO3	List out the biodiversity of India, threats and its conservation methods	-	-	-	-	-	1	3	-	-	-	-	-	-	-
CO4	Explain the different types of pollutions and their control technologies, Waste water treatment, Bio medical waste management etc.	-	-	2	-	-	2	3	-	-	-	-	-	-	-
CO5	Explain EIA- Environmental Impact Assessment, Sustainable developmental activities, environmental policies and regulations.	-	-	2	-	-	2	3	-	-	3	-	-	-	-
Course Code	**171BS2T05 -Applied Chemistry**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain polymeric materials their uses and moulding techniques of plastics.	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Analyse fuel characteristics using Calorific value, knocking characteristics and flue gas analysis.	2	-	-	-	-	-	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
CO3	Explain the working principle of Electro chemical cells and corrosion characteristics.	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Explain the properties and applications of Nano, Superconductors, Semiconductors, Liquid crystals and fuel cells.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Summarize non-conventional energy sources and their applications.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171ES2T02 -Engineering Mechanics**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Determine the resultant force and moment for a given force system.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Explain the concept of friction.	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Calculate the forces in planar and spatial systems.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Locate centroid of composite areas and centre of gravity of composite bodies.	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Calculate the moment of inertia of composite areas and rigid bodies.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO6	Apply the concepts of kinematics, kinetics, work - energy and impulse - momentum methods to particle motion.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171CS2T01- Data Structures through C**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe the the fundamental concepts of data structure and algorithms,	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Analyze the time and space complexity of an algorithm using various notations.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Apply various searching and sorting techniques to solve computing problems.	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Explain various operations and applications of Linear Data Structure.	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Apply various tree , graph traversing techniques and spanning trees in solving complex problem.	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171HS2L02 - English Communication Skills Lab – II**	**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**	**-**	**-**

	CO Statements	POs												PSOs	
Course Code	**171BS2L03 - Applied Chemistry Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate Acid –Complex metric titrations by volumetric analysis.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Demonstrate Acid – Base titrations by instrumental analysis.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Estimate Vitamin C using volumetric analysis	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Prepare polymer like Bakelite.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Prepare alternative fuel like Bio-Diesel.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171ES2L02 - Engineering Workshop And IT Workshop**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Prepare carpentry, fitting joints as per the given requirement using Carpentry and Fitting tools	**3**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Convert the metal rods and sheets into final shape using black smithy and tin smithy tools	**3**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Prepare the circuit for house wiring applications	**3**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Install the operating system software , networking and troubleshoot the problems	**3**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Develop documents using MS-Office and LaTeX tools	**3**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	III SEM														
Course Code	**171BS3T08-Mathematical Foundations of Computer Science**	**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**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Compute Transitive closure, equivalence classes of binary relations.	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Apply the principles of number theory and group theory.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Solve recurrence relations by various methods.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Apply the concepts of graph theory to find euler paths, hamiltonian paths, spanning trees, minimal spanning trees and chromatic number.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171ES3T23-Digital Logic Design**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Interpret numeric information in different bases, signed integers.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**-**
CO2	Classify Boolean expressions using postulates of Boolean algebra.	**1**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Simplify the given Switching functions in SOP and POS forms using Karnaugh-Map.	**1**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Analyze basic combinational and sequential logic circuits with simplified logical functions.	**2**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Develop sequential logic circuits with sequential building blocks.	**2**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171CS3T02-Statistics with R Programming**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify discrete and continuous random variables and data structures in R.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**

	CO Statements	POs												PSOs	
CO2	Apply discrete and continuous probability distributions to the given data and execute R-functions for probability distributions.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Explain sampling distribution, estimation and R-functions forconstructing confidence intervals.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Write R program for standard statistical test.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Apply the concepts of correlation and regression to the given statistical data using R-function and making use of R-graphic functions to visualize the data.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171CS3T03-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.	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Summarize the OOPS concepts.	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Make use of constructor and destructor to initialize and destroy class objects.	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Develop programs using virtual functions and Polymorphism.	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Apply inheritance to build real time applications, Exception handling mechanism to handle runtime errors.	**1**	**2**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Develop C++ classes with templates and STL.	**3**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171HS3T04-Managerial Economics & 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**	**-**	**-**	**-**	**-**	**-**
CO2	Illustrate the law of demand and its exceptions, to use different forecasting methods for predicting demand for various products and services	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**
CO3	Identify the cost behavior, costs useful for managerial decision making and Break Even Point (BEP) of an enterprise.	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**
CO4	Outline the different types of business organizations along with basic knowledge on business cycle.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**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**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**
CO6	Utilize various techniques on investment project proposals with the help of capital budgeting techniques for decision making.	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**

	CO Statements	POs												PSOs	
Course Code	**171CS3T04-Advanced Data Structures**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe the working principles of K-way Merge Sort.	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Apply Hashing Techniques to solve data integrity problems.	**1**	**2**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Explain the various techniques to implement Priority Queues.	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Compare various balanced search Trees.	**3**	**-**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Compare and contrast B and B+ trees.	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Construct various kinds of Tries.	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171CS3L01-Object Oriented Programming Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make Use of Control Structures and modular programming in solving complex problems.	**-**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**3**	**1**	**-**	**-**	**2**	**-**
CO2	Apply object oriented techniques to solve computing problems.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**	**-**	**1**	**-**
CO3	Experiment with the key features of the object-oriented programming language.	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**	**-**	**2**	**-**
CO4	Develop C++ classes for code reuse through inheritance.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**	**-**	**2**	**-**
CO5	Apply exception handling technique to handle various errors.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**	**-**	**3**	**-**
CO6	Develop C++ programs using Inline, friend functions, Reference variable, this pointer, operator Overloading, static and dynamic binding, template and STL.	**-**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**	**-**	**1**	**-**
Course Code	**171CS3L02-Advanced Data Structures Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Construct the graph traversals and minimum spanning tree for a given graph.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**2**
CO2	Develop program to implement lossless data compression algorithm.	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**3**	**-**	**-**	**-**	**-**
CO3	Apply the hashing techniques to implement Dictionary.	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**3**
CO4	Build a Binary Heap using Priority queues.	**-**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**
CO5	Analyze various basic operations of AVL tree, Red-Black tree, B-Tree to improve the efficiency.	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**-**	**-**	**-**	**2**
CO6	Identify the appropriate data structure for a given problem.	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**3**	**1**	**-**	**-**	**-**	**-**
Course Code	**171HS3A10-Employability Skills - I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the number and letter series and analogies in different models	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO2	Demonstrate processes of coding & decoding and direction test	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
CO3	Demonstrate the basic grammatical skills using articles and prepositions	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
CO4	Use tenses, voice types and conversion rules to deliver an effective speech	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
CO5	Demonstrate creative speaking abilities using all forms of sentences	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**

	CO Statements	POs												PSOs	
Course Code	**171HS3A09-Professional Ethics and Human Values**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of values, morals and ethics in their day-to-day life.	-	-	-	-	-	-	-	2	-	-	-	-	-	-
CO2	Identify what is right and wrong through moral ethics.	-	-	-	-	-	-	-	2	-	-	-	-	-	-
CO3	Analyze experimental learning while developing the society with ethos.	-	-	-	-	-	-	-	2	-	-	-	-	-	-
CO4	Apply ethical principles to resolve the problems that arise in work place.	-	-	-	-	-	-	-	2	-	-	-	-	-	-
CO5	Apply adequate knowledge on global code of conduct.	-	-	-	-	-	-	-	2	-	-	-	-	-	-
IV SEM															
Course Code	**171CS4T05-Software Engineering**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate an understanding of the key facts, concepts, principles, and theories of software engineering.	3	1	1	-	-	-	-	-	-	-	-	-	2	-
CO2	Analyze the effective software engineering process, based on knowledge of widely used development lifecycle models.	2	2	3	2	-	-	-	-	-	-	-	-	3	-
CO3	Explain the various responsibilities and activities of project management.	3	-	1	-	-	-	-	-	-	-	-	-	1	-
CO4	Translate a requirements specification into an implementable design, following a structured and organized process.	1	2	2	3	-	-	-	-	-	-	-	-	2	-
CO5	Examine a testing strategy for a software system using different testing techniques.	2	2	3	-	-	-	-	-	-	-	-	-	1	-
CO6	Discuss about software reliability, quality management, software maintenance and reusability.	3	1	-	1	-	-	-	-	-	-	-	-	1	-
Course Code	**171IT4T01-Language Processors**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Construct DFA and NFA for regular languages.	1	3	1	-	-	-	-	-	-	-	-	-	2	-
CO2	Analyse the different phases in compilation process.	2	3	2	-	-	-	-	-	-	-	-	-	2	-
CO3	Identify the similarities and differences among various parsing techniques.	2	2	3	-	2	-	-	-	-	-	-	-	2	-
CO4	Construct various forms of intermediate code.	3	2	2	-	-	-	-	-	-	-	-	-	1	-
CO5	Explain the role of different types of runtime environments.	3	1	-	-	-	-	-	-	-	-	-	-	1	-
CO6	Develop target optimized code for given intermediate code.	2	2	1	-	3	-	-	-	-	-	-	-	2	-
Course Code	**171CS4T07-Java Programming**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe the basic concepts and building blocks of java.	2	1	-	-	-	-	-	-	-	-	-	-	1	-
CO2	Solve complex problems using the concepts of class, inheritance, interface and packages	2	1	3	-	2	-	-	-	-	-	-	-	2	-
CO3	Test for runtime exceptions arise in java applications	2	1	3	-	2	-	-	-	-	-	-	-	2	-

	CO Statements	POs												PSOs	
CO4	Develop real time applications using multithreading and I/O streams.	**2**	**1**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Apply java applets to standalone applications.	**3**	**1**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Develop GUI applications using event handlers, adapter classes, AWT and Swing components.	**3**	**1**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171CS4T08-Database Management Systems**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Summarize various database characteristics.	**2**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Identify various database architectures.	**2**	**-**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Interpret relational database using SQL.	**1**	**-**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Examine issues in data storage and query processing for appropriate solutions.	**1**	**2**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Make use of normalization techniques for database design.	**2**	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO6	Illustrate the mechanisms of transaction management.	**2**	**2**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171HS4T05-Management Science**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply management and motivation theories to renovate the practice of management.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**1**	**-**	**-**
CO2	Use principles of Statistical Quality Control and Materials managementin the design of products and process controls.	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**1**	**-**	**-**
CO3	Appraise the functional management challenges associated with high levels of change in the organizations.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
CO4	Identify activities with their interdependency and use scheduling techniques of project management PERT/CPM.	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**1**	**-**	**-**
CO5	Develop global vision and management skills both at strategic level and interpersonal level.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
Course Code	**171CS4T10-Computer Organization**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe the structure and various types of instructions in the computer system.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Demonstrate the working of CPU, RISC and CISC architecture.	**2**	**2**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Summarize the computer arithmetic.	**2**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Demonstrate the use of pipeline and vector processing.	**2**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Exemplify I/O and Memory organization.	**1**	**2**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171CS4L03-Java Programming Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply OOP concepts to solve basic problems in Java.	**-**	**1**	**3**	**-**	**1**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**1**	**-**
CO2	Make use of class, inheritance, interface and packages to develop solutions to complex problems.	**-**	**1**	**3**	**-**	**2**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**1**	**-**
CO3	Develop a solution for a real time problem using Exception handling.	**-**	**1**	**3**	**-**	**2**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**1**	**-**

	CO Statements	POs												PSOs	
CO4	Build java applications using Threads.	**-**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
CO5	Apply applets and event handling to create interactive applications.	**-**	**1**	**3**	**-**	**2**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
CO6	Design GUI using AWT and Swing Components.	**-**	**1**	**1**	**-**	**3**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
Course Code	**171CS4L04-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 database design.	**-**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**
CO2	Construct a database schema for a given problem-domain.	**-**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**
CO3	Apply Normalization techniques on a database to avoid anomalies.	**-**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**2**	**-**
CO4	Build queries on a database using SQL DML/DDL commands.	**-**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**2**	**-**
CO5	Apply integrity constraints on a database using RDBMS.	**-**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**1**	**-**
CO6	Develop PL/SQL stored procedures, stored functions, cursors and packages.	**-**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**2**	**-**
Course Code	**171HS4A11-Employability Skills - II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Examine the symbols, notations and venn diagrams	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO2	Use verbal adjectives, degree of comparisons in personality development	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO3	Solve problems of time & date and puzzles	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO4	Solve problems of cubes & dice and seating arrangements	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
CO5	Use word analogy & paragraph writing for effective communication	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
Course Code	**171HS4A08-Intellectual Property Rights And Patents**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Compare various types of Intellectual Property rights.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**	**-**
CO2	Discuss Intellectual Property and infer rights on such Intellectual Property owners	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**	**-**
CO3	Explain the process of patenting	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**	**-**
CO4	Apply for trade marks and trade secrets.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**	**-**
CO5	Interpret the legal issues on Intellectual Property Rights and cyber laws	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**	**-**
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Course Code	**171IT5T02-Computer Networks**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the computer network fundamentals and various topologies.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Compare the OSI with TCP/IP reference model.	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	Summarize the concepts of physical layer and switching techniques.	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Discuss the design issues of data link layer services.	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Demonstrate the concept of MAC and Channelization.	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
CO6	Apply various routing algorithms and Congestion control techniques and describe services provided by the transport layer and application layer.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171CS5T12-Python Programming**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain fundamental concepts of Python programming language.	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Develop programs using control statements.	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Make use of data structures in Python to solve various problems.	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Develop programs using functions, strings and files.	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Make Use of Standard libraries like math, turtle, tkinter, re etc. in building real time applications.	**2**	**1**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Explain Object Oriented Programming concepts, Exceptions and applications using DB connectivity.	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171IT5T03-Unix and Shell Programming**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe UNIX Operating System Architecture and Command Structure.	**1**	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Make use of various commands in UNIX to control the resources like disk, file and network.	**-**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Apply GREP and EGREP Commands with wild card and regular expressions to perform Data Manipulation Tasks.	**-**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Develop Shell Script using Shell commands.	**-**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Utilize Filter commands to work on files and documents.	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Apply AWK Scripts, shell programming and system calls for file management tasks.	**-**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171CS5T14-Operating Systems**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Interpret the basic structure, services, system calls and architectural components of Operating Systems.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Solve problems related to process scheduling, synchronization in unit and multi-processing systems.	**2**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Explain the deadlock handling Mechanism in the processing System	**2**	**2**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Summarize the concepts of Memory Management, Virtual Memory Management and Thrashing	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Describe the concepts of file system and mass storage structure.	**2**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
Course Code	**171IT5E01-Artificial Intelligence(Professional Elective-I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the fundamentals of Artificial Intelligence and its applications.	-	3	-	2	-	-	-	-	-	-	-	-	-	2
CO2	Describe various problems solving techniques and searching techniques.	-	2	-	-	3	-	-	-	-	-	-	-	-	2
CO3	Apply various logical systems to inference the different logical problems.	-	2	3	1	2	-	-	-	-	-	-	-	-	3
CO4	Demonstrate the concept of Knowledge Representation Techniques.	-	2	2	1	2	-	-	-	-	-	-	-	-	2
CO5	Develop Expert System and applications.	-	2	1	-	-	-	-	-	-	-	-	-	-	2
CO6	Identify various interpretations of probability theory, basic knowledge of fuzzy sets and fuzzy logic.	-	2	-	2	-	-	-	-	-	-	-	-	-	3
Course Code	**171CS5E02-Advanced Computer Architecture(Professional Elective – I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Summarize classes of computers, new trends and developments in computer architecture.	-	3	-	1	-	-	-	-	-	-	-	-	1	-
CO2	Compare several advanced optimizations to achieve cache performance, virtual memory and virtual machines to achieve memory consistency.	2	3	-	2	1	-	-	-	-	-	-	-	1	-
CO3	Distinguish CISC & RISC instructions in high performance computing.	2	2	-	3	-	-	-	-	-	-	-	-	1	-
CO4	Evaluate various multiprocessing configurations.	-	2	-	3	-	-	-	-	-	-	-	-	2	-
CO5	Examine performance benefits of integrating message passing in cache coherent multiprocessor.	1	2	-	3	-	-	-	-	-	-	-	-	3	-
Course Code	**171CS5E03-Computer Graphics(Professional Elective – I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify the applications of computer graphics and video display devices for implementing graphical user interface.	3	2	-	-	-	-	-	-	-	-	-	-	2	-
CO2	Anlayse output primitives and filled area primitives in implementing various algorithms.	2	3	2	2	-	-	-	-	-	-	-	-	2	-
CO3	Make use of geometric tranformations , viewing and clipping in 2D and 3D graphics.	2	2	-	-	-	-	-	-	-	-	-	-	2	-
CO4	Illustrate the various visual sirface detection methods in 3D graphics	2	1	2	-	-	-	-	-	-	-	-	-	2	-
CO5	Apply openGL for grnrral computer animations.	3	2	2	-	3	-	-	-	-	-	-	-	1	-
CO6	Analyse different object and color modelling techniques, fractals and ray tracing classifications.	2	2	-	-	-	-	-	-	-	-	-	-	1	-

	CO Statements	POs												PSOs	
Course Code	**171CS5E04-Software Testing Methodologies(Professional Elective – I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the fundamentals of software testing.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Compare SDLC with STLC.	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Summarize verification and validation activities.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Design the test cases using different testing strategies.	**2**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Outline the importance of static testing and various levels of software testing.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO6	Discuss about various Automation Testing tools.	**1**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171HS5T06- Employability Skills – III**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Calculate the L.C.M and H.C.F of numbers	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO2	Solve problems on Numbers & Simple equations	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO3	Apply different types of models on ratio & proportion, average, ages and percentages	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO4	Apply interviewing skills, Group discussion skills and personal priorities	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
CO5	Apply resume writing skills, e-mail writing & business etiquette	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
Course Code	**171IT5L01-Operating Systems and Computer Networks 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 the Unix utilities.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO2	Simulate various process scheduling algorithms.	**-**	**2**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	Demonstrate the working of various system calls, dead locks avoidance and memory management algorithms.	**-**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Make use of a programming platform to design services that control a network behavior.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Develop data link layer services of dynamic framing.	**-**	**2**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO6	Demonstrate the working of various routing algorithms, error detection and correction techniques.	**-**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171CS5L06-Python Programming Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Build basic programs in Python.	**3**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**
CO2	Develop programs using conditional and iterative statements.	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**
CO3	Make use of different data structures in solving complex problems.	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**
CO4	Apply standard libraries in building real time applications.	**3**	**2**	**3**	**-**	**2**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
CO5	Analyze the Object Oriented concepts in Python	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Solve real world problems using database connectivity, GUI and files.	**2**	**-**	**2**	**-**	**3**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**3**	**-**
Course Code	**171CS5L07-Software Testing Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Experiment with various Java programs for writing test cases.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Construct manual test cases for different software modules.	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Develop test cases for various Case studies.	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Apply any testing tool for implementing automation testing.	**2**	**2**	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Design the test cases for checking GUI objects.	**2**	**2**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
Course Code	**171IT5L02-Unix and Shell Programming Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of various commands in UNIX to control various resources like file, network, disk etc.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO2	Develop Shell Script using Shell commands.	**-**	**2**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Implement AWK Script using AWK commands.	**-**	**2**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Apply system calls for File Management, Process Management and IPC.	**-**	**2**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Develop scripts using FIFO, Message Queues, Shared Memory.	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
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Course Code	**171IT6T04-Object Oriented Analysis and Design Using UML**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate the Conceptual model of UML.	**2**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Illustrate classes, objects and relationships for designing a software system.	**2**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Build use-case and interactive diagrams for different applications.	**2**	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Develop activity diagram and its modeling techniques.	**3**	**2**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Model events and signals using different modeling techniques.	**3**	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO6	Design state machine and state chart diagrams, Component and Deployment Diagrams for real time applications.	**2**	**2**	**2**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
Course Code	**171CS6T16-Web Technologies**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop web pages using HTML, CSS and JavaScript.	**2**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Summarize DTD, Schema and Parsing tools of XML documents.	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Build web applications using PHP and MySQL database.	**3**	**-**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Discuss the integration of PHP with AJAX.	**2**	**-**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Develop simple applications using PERL.	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Apply basic features of Ruby in various applications.	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
Course Code	**171CS6T17-Data Warehousing And Data Mining**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Analyze OLTP and OLAP.	-	3	-	2	-	-	-	-	-	-	-	-	-	2
CO2	Illustrate the Database technologies useful for data mining.	1	2	3	1	-	-	-	-	-	-	-	-	-	1
CO3	Make use of data pre processing techniques in KDD Process.	2	1	-	3	-	-	-	-	-	-	-	-	-	1
CO4	Apply decision tree algorithm for classification problems and association rule mining for predicting patterns.	2	1	3	1	-	-	-	-	-	-	-	-	-	3
CO5	Develop classification model for a given dataset.	2	1	3	1	-	-	-	-	-	-	-	-	-	2
CO6	Compare different types of clustering algorithms.	2	3	-	1	-	-	-	-	-	-	-	-	-	1
Course Code	**171CS6E05-Software Quality Assurance(Professional Elective – II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain various components of Quality assurance system.	2	2	-	-	-	-	-	-	-	-	-	-	1	-
CO2	Summarize various Testing Strategies.	2	2	-	-	-	-	-	-	-	-	-	-	2	-
CO3	Demonstrate various components of Quality assurance Infrastructure.	3	2	-	-	-	-	-	-	-	-	-	-	1	-
CO4	Classify Software Quality Metrics.	2	3	-	1	-	-	-	-	-	-	-	-	1	-
CO5	Analyze various Standards in software quality assurance.	-	2	-	2	-	-	-	-	-	-	-	-	2	-
CO6	Outline the role of Management in software quality assurance.	2	2	-	-	-	-	-	-	-	-	-	-	3	-
Course Code	**171IT6E02-Neural Networks (Professional Elective – II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Interpret the basic structure of Artificial Neural Networks (ANN).	2	1	-	-	3	-	-	-	-	-	-	-	2	-
CO2	Compare different learning techniques.	3	2	-	-	2	-	-	-	-	-	-	-	3	-
CO3	Demonstrate the perceptron and pattern classifier.	2	1	-	-	3	-	-	-	-	-	-	-	3	-
CO4	Analyze various mechanisms of multi-layer feed forward network.	3	1	2	-	2	-	-	-	-	-	-	-	3	-
CO5	Make use of Radial Basis Function(RBF) in ANN.	3	2	1	-	2	-	-	-	-	-	-	-	3	-
CO6	Discuss the issues related to designing of RBF.	2	1	-	-	3	-	-	-	-	-	-	-	2	-
Course Code	**171CS6E08-Social Networks and Semantic Web(Professional Elective – II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Summarize the concepts of semantic web and social network analysis.	-	3	-	1	-	-	-	-	-	-	-	-	-	1
CO2	Describe the knowledge representation on the Semantic web.	-	3	-	-	-	-	-	-	-	-	-	-	-	1
CO3	Make use of ontology engineering in social networks.	-	2	3	-	-	-	-	-	-	-	-	-	-	2
CO4	Identify the architectures and challenges in building social networks.	-	2	1	-	-	-	-	-	-	-	-	-	-	1
CO5	Compare various survey methods of social networks.	1	2	3	-	-	-	-	-	-	-	-	-	-	1
CO6	Analyze the performance of social networks using electronic sources.	-	2	-	3	-	-	-	-	-	-	-	-	-	2

	CO Statements	POs												PSOs	
Course Code	**171IT6E03-Design and Analysis Of Algorithms (Professional Elective – II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop algorithms for various computational problems.	**2**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**
CO2	Analyze time and space complexities of an algorithm.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**
CO3	Construct sorting and searching algorithms using Divide and Conquer approach.	**1**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**
CO4	Apply Greedy method with heuristic approach in tracing the global optimal solution from local optimal solutions.	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**
CO5	Compare the benefits of using Dynamic programming over Greedy method.	**-**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**
CO6	Solve problems applying Backtracking strategy and Branch & Bound strategy.	**2**	**1**	**2**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171IT6E04-Advanced Computer Networks(Professional Elective – III)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the methods of addressing using Internet Protocol.	**2**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Compare IPv4 and IPv6.	**3**	**2**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	Summarize the concepts of congestion control in TCP layer.	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Discuss the basic concepts of Blue Tooth technology and Cellular Telephony.	**3**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Demonstrate how to provide Quality of Service in a network.	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO6	Illustrate the characteristics of Computing Grids and P2P Networks	**3**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
Course Code	**171CS6E10-Parallel Computing(Professional Elective – III)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe the need of parallel processing and parallel approaches.	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Make use of PRAM algorithms to solve various applications.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Demonstrate different networks of processor organizations.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Discuss on elementary parallel algorithms.	**1**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Compare Matrix multiplication using different models.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO6	Interpret sorting, dictionary operations, and graph search algorithms.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171IT6E05-Multimedia Programming (Professional Elective – III)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify the various Data Representation Techniques.	**3**	**2**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO2	Demonstrate the working principle of Text compression Techniques.	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Make use of different compression Techniques on image.	**3**	**2**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Compare various Audio compression Techniques.	**3**	**2**	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**

	CO Statements	POs												PSOs	
CO5	Demonstrate the basic operations of Video Compression Techniques.	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Identify different Multimedia Applications.	**2**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171CS6E12-E – Commerce(Professional Elective-III)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the fundamentals of E-Commerce and its applications in different orientations.	**-**	**3**	**-**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Compare mercantile process models of different perspectives.	**-**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Contrast on different payment models in E-Commerce applications.	**-**	**2**	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Discuss on design issues of Intra-Organizational E-Commerce and Inter-Organizational E-Commerce.	**-**	**3**	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Identify different types of digital documents and their features, advantages and disadvantages.	**-**	**2**	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO6	Summarize the concepts of digital document management, concepts of marketing strategies in E-Commerce, information search and discovery, different services offered by multimedia to E-Commerce firms.	**-**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171HS6T07-Employability Skills-IV**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Solve problems on Profit & Loss, Simple Interest & Compound Interest, Time & Work	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO2	Solve problems on Pipes & Cisterns, Time & Distance, Boats & Streams	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO3	Interpret the data collected for effective presentation	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO4	Apply processes of Group discussion, Phonetics, Leadership skills in real world	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**1**	**-**	**-**
CO5	Apply principles of Group Dynamics, Interview Skills & Evaluation criteria in organizations	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**1**	**-**	**-**
Course Code	**171IT6L03-Unified Modelling Language Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the importance of system analysis and design in solving complex problems.	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Compare object-oriented approach with traditional approach in system analysis and design.	**3**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Analyze the importance of modeling and design of various applications.	**3**	**-**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Construct various UML models using appropriate notations.	**3**	**2**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Compare various object relationships.	**2**	**3**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**

	CO Statements	POs												PSOs	
CO6	Show the role and function of each UML model in developing object-oriented software.	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
Course Code	**171CS6L10-Data Ware Housing and Data Mining Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Determine different steps for pre-processing in Data mining.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Use data mining software system for solving data mining problems.	**-**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**1**	**1**	**-**	**-**	**1**	**-**
CO3	Test real data sets using popular data mining tools such as WEKA.	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**3**	**-**
CO4	Apply algorithms for Association rule mining.	**-**	**2**	**1**	**3**	**3**	**-**	**-**	**-**	**3**	**3**	**-**	**-**	**2**	**-**
CO5	Apply Classification methods for data mining.	**-**	**2**	**2**	**1**	**3**	**-**	**-**	**-**	**3**	**3**	**-**	**-**	**2**	**-**
CO6	Demonstrate the Clustering basics and approaches in data mining.	**-**	**2**	**2**	**1**	**3**	**-**	**-**	**-**	**3**	**3**	**-**	**-**	**2**	**-**
Course Code	**171CS6L11-Web Technologies Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop web pages using HTML, CSS and JavaScript.	**3**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
CO2	Apply DTD to validate the XML Document.	**3**	**2**	**3**	**-**	**3**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**
CO3	Build real time applications using PHP and MySQL.	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**-**
CO4	Construct basic programs using Perl.	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
CO5	Construct basic programs using Ruby.	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
	VII SEM														
Course Code	**171CS7T18-Cryptography And Network Security**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the network security fundamentals and various public key cryptographic algorithms.	**2**	**1**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Compare various symmetric encryption techniques.	**2**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Summarize the concepts of asymmetric encryption techniques.	**3**	**1**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Discuss the functioning of digital signature standards and data integrity.	**2**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Utilize the services provided by the PGP, S/MIME & SSL, TLS.	**1**	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Demonstrate the concept of IP Security.	**2**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171IT7T05-Big Data Analytics**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop various data structures using java collection framework.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**-**
CO2	Demonstrate Building blocks of Hadoop.	**2**	**3**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**
CO3	Choose map reduce approach to solve big data Problems.	**3**	**2**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**
CO4	Make use of Pig Framework to work with big data.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**
CO5	Utilize Hive to Structure the Data.	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**
Course Code	**171CS7T20-Cloud Computing**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the fundamentals of computing paradigm and cloud computing.	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**

	CO Statements	POs												PSOs	
CO2	Demonstrate the basic concepts of virtualization and implementation levels of Virtualization	**3**	**1**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Illustrate the architecture of cloud computing.	**2**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Apply the Cloud programming and software environments on any real cloud service.	**1**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Analyze the Cloud Security risks and Mechanisms.	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171IT7T06-Mobile Computing**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe the basic concepts and principles in mobile computing.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Identify the various subsystems in GSM and GPRS architecture.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Illustrate the concept of Medium Access Control Mechanisms.	**-**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Apply Mobile IP in Wireless environment to handle packet delivery during mobility.	**-**	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Compare Traditional TCP and Modified TCP	**1**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Discuss various database issues and data delivery mechanisms in mobile environment, Data Synchronization Protocols, Routing Techniques in MANET, Protocols and Platforms for Mobile Computing.	**3**	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171CS7E13-Software Project Management(Professional Elective-IV)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain Software Project Management fundamentals and Planning activities.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**	**2**	**-**
CO2	Compare SDLC models in project framework.	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**3**	**-**	**2**	**-**
CO3	Apply various Effort estimation techniques and tools in real time applications.	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**	**2**	**-**
CO4	Discuss various Risk categories, Project Monitoring Control and Resource Allocation.	**-**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**2**	**-**	**2**	**-**
CO5	Demonstrate the concept of Software Quality.	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**3**	**-**	**2**	**-**
Course Code	**171IT7E06-Machine Learning(Professional Elective-IV)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the models, classification, scoring and ranking estimations.	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO2	Apply supervised, unsupervised and concept learning in solving real time problems.	**2**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	Make use of Tree based and Rule based models in classification and regression problems.	**2**	**3**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Experiment with linear and distance based models in solving classification, regression and clustering problems.	**3**	**2**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
CO5	Utilize probabilistic models, to predict probability distribution over a set of classes on a given observation.	**2**	**2**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Make use of Feature modeling for identifying the features that best fit for classifying a given dataset.	**3**	**2**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171CS7E15-Image Processing(Professional Elective – IV)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Discuss the steps and components of image processing system.	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Demonstrate the fundamentals of digital images.	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Illustrate the basic properties of digital images	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Outline different colour image processing techniques.	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Apply morphological image processing operations to process an image.	**2**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Interpret an image using different segmentation techniques, use different types of compression techniques in image data compression	**1**	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171CS7E16-Cyber Laws(Professional Elective-IV)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify the need for IT acts.	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**2**	**-**
CO2	Summarize IT act 2000 and its relevance.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**2**	**-**
CO3	Discuss cyber crimes.	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**2**	**-**
CO4	Apply existing tools to counter cyber crimes.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**2**	**-**
CO5	Demonstrate hacking and identity thefting happens.	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**3**	**2**	**-**
CO6	Describe cyber crimes handled in India.	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**1**	**-**
Course Code	**171CS7E19-Information Retrieval Systems(Professional Elective-V)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply Information Retrieval principles to locate relevant information in large collections of data.	**3**	**2**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Summarize the functions in Information system.	**2**	**3**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Make use of Inverted file data structure in IR process.	**3**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Analyze the different signature based text retrieval methods.	**2**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Explain various algorithms for text searching in PAT tree.	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Utilize different stemming algorithms in Information Retrieval, various techniques to create Thesaurus clusters.	**2**	**3**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171IT7E07-Human Computer Interaction(Professional Elective – V)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Outline the importance of human computer interaction for a good design.	**2**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Develop a GUI application for Understanding of Users.	**2**	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
CO3	Distinguish Online Vs Paper documentation in various development processes and social networking.	**3**	**-**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Analyze screen design of various applications in GUI and Web.	**3**	**-**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Compare Device based and Screen based controls.	**2**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Summarize effective feedback guidance and assistance.	**3**	**-**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171IT7E08-Distributed Systems (Professional Elective-V)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate the basic concepts of distributed systems.	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Analyze the Various System Models in distributed systems.	**1**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Illustrate the Inter process Communication used in TCP and UDP.	**3**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Apply RMI with RPC in the implementation of Remote Invocations.	**1**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Summarize Operating System support and Distributed File Systems.	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO6	Organize the processes to coordinate their actions and agree on shared values in distributed systems and relate the Transactions and Replications with real time examples.	**2**	**3**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
Course Code	**171IT7E09-Decision Support System(Professional Elective-V)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Choose appropriate decision support system for generating innovative business solutions.	**3**	**2**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO2	Identify the relationship between business information needs and decision making.	**3**	**2**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Measure the general nature and range of Decision Support Systems.	**2**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Outline the issues related to the development of Decision Support System.	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Analyze the problems related to the decision support system	**-**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO6	Illustrate the working of decision support systems used in different kinds oforganizations.	**-**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
Course Code	**171IT7L04-Mobile Computing Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Use Classes to develop J2ME applications to solve real time problems.	**3**	**-**	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Apply Event handling technique using J2ME.		**2**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Develop basic android mobile applications.	**1**	**-**	**2**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Create an android application to implement Intents.	**1**	**2**	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Apply Layouts techniques to solve orientation problems.		**1**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Build real time applications using android.	**2**	**3**	**2**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**

	CO Statements	POs												PSOs	
Course Code	**171CS7L13-Big Data Analytics Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop linear and non linear data structures using Java Collection framework	-	2	-	-	2	-	-	-	2	-	-	2	1	-
CO2	Build the Hadoop Cluster using various installation modes.	-	2	-	-	2	-	-	-	2	-	-	2	2	-
CO3	Apply hadoop commands to interact with HDFS.	-	2	-	-	2	-	-	-	2	-	-	2	2	-
CO4	Solve Big Data Problems using Map Reduce approach.	-	1	-	-	2	-	-	-	2	-	-	2	1	-
CO5	Analyse the big data using Pig Latin.	-	2	-	-	2	-	-	-	2	-	-	1	2	-
CO6	Build queries using Hive Query Language.	-	1	-	-	2	-	-	-	2	-	-	2	2	-
Course Code	**171IT7P01-Industry Oriented (Internship) Minor Project**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Conduct a technical survey to identify a real world engineering problem	1	1	-	-	-	-	-	-	-	1		1	-	1
CO2	Analyze the industrial plant layout using technical expertise	2	-	-	-	-	1	1	-	-			1	-	1
CO3	Compare theoretical and real work environments in technical perspective	2	-	-	-	-	-	-	-	-	1	1	1	-	1
CO4	Identify the challenges in the execution of operations	1	1	1	1	-	-	-	-	-	-	-	-	-	1
CO5	Execute the operations and report the results of assigned tasks using modern tools adhering to professional ethics	-	-	-	-	2	-	-	2	1	1	-	-	-	1
VIII SEM															
Course Code	**171CS8E21-Agile Methodologies(Professional Elective-VI)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Compare the Agile Model with Traditional Models	3	1	-	-	-	-	-	-	-	-	-	-	2	-
CO2	Summarize the Agile Manifesto.	2	1	-	-	-	-	-	-	-	-	-	-	3	-
CO3	Demonstrate the various Agile Software Development Process Models.	2	3	-	-	-	-	-	-	-	-	-	-	2	-
CO4	Model the Sprint framework in Agile environment.	3	2	1	1	-	-	-	-	-	-	-	-	1	-
CO5	Create User Stories for software requirements in Agile Software Development.	2	2	3	3	-	-	-	-	-	-	-	-	1	-
CO6	Identify the role of Product Backlog and Estimations for each Sprint and plans for each Sprint in the Scrum Framework.	2	3	1	1	-	-	-	-	-	-	-	-	2	-
Course Code	**171CS8E22-Cyber Security(Professional Elective-VI)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Illustrate cybercrime fundamentals.	3	1	-	-	2	-	-	2	-	-	-	-	2	-
CO2	Analyze cyber offence planning.	2	3	-	2	2	-	-	-	-	-	-	-	2	-
CO3	Interpret cybercrime on mobile and wireless devices.	1	2	-	2	3	-	-	-	-	-	-	-	2	-
CO4	Distinguish type of tools and methods used in cyber crimes.	1	2	-	3	2	-	-	-	-	-	-	-	2	-
CO5	Explain the importance of cyber security.	2	1	-	-	2	-	-	3	-	-	-	-	2	-

	CO Statements	POs												PSOs	
Course Code	**171CS8E23-Distributed Databases(Professional Elective VI)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Outline the features and principles Develop system architecture based on distributed databases.	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Solve transforming a global query into local query using optimizing techniques.	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	Summarize the distributed transaction management principles.	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Explain various distributed concurrency control techniques.	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Evaluate the Non-blocking Commitment Protocols.	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171IT8E10-Pattern Recognition(Professional Elective – VI)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Interpret the fundamental concepts of machine perception and Bayesian decision theory in machine learning.	**3**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Inspect parameter estimation in relatively complex probabilistic models using Maximum likelihood and Bayesian approaches.	**1**	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Apply unsupervised and supervised leaning in simple pattern matching problems.	**-**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Summarize the principles of pattern recognition using Hidden Markov Models.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Examine the benefits of Decision Trees in Pattern construction and classification.	**1**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171IT8O01-Management Information System(Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Evaluate the role of information systems in business environment.	**3**	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Identify problems and also generate solutions by using MIS in organization.	**3**	**2**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**
CO3	Demonstrate systems analysis, design and decision making in a business setting.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Apply MIS to solve business problems and decision making.	**3**	**2**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Illustrate how information systems support the activities of managers and end-users in organizations	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171CS8O01-Microprocessor and Multi Core Systems(Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Analyze the generalized concepts of basic microprocessors.	**2**	**2**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Develop the basic concepts of programming 8086 microprocessor.	**2**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Construct the different styles of programming 8086 microprocessor.	**2**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Classify the advanced microprocessors based on their features and architecture.	**2**	**2**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

	CO Statements	POs												PSOs	
CO5	Apply the knowledge of multi core architectures in parallel programming environment.	**2**	**2**	**1**		**1**		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171CS8O02-Embedded Systems(Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Illustrate the basic concepts of an embedded systems with hardware components.	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Categorize the microcontrollers required to design an embedded systems.	**1**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Identify the different RTOSs for various embedded and real time applications.	**2**	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Examine the different issues RTOS objects in embedded systems.	**1**	**3**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Assess the embedded systems by various implementation and development tools.	**1**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
Course Code	**171IT8O02-Computer Vision(Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain fundamental concepts in computer vision (camera and projection models, image formation, image features, calibration, stereo).	**2**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Differentiate affine structure from motion, projective structure from motion.	**2**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Analyze the strengths and weaknesses of different methods and techniques for segmentation.	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**
CO4	Make use of various clustering and classification models for object identification.	**2**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Discuss different approaches to image-based rendering.	**2**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
Course Code	**171EE8O05-Robotics(Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate the basic concepts, parts of robots and types of robots.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**2**	**3**	**-**	**-**
CO2	Identify various robot configuration and components.	**3**	**2**	**-**	**-**	**-**	**-**	**3**	**-**	**3**	**-**	**3**	**-**	**-**	**3**
CO3	Select appropriate actuators and sensors for a robot based on specific application.	**3**	**-**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Analyze the simple serial kinematic chains.	**3**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Analyze the trajectory planning for a manipulator by avoiding obstacles.	**3**	**3**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**3**	**3**
Course Code	**171CS8O04-Operations Research(Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply mathematical modelling to formulate real-world problems involving decision making.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**

	CO Statements	POs												PSOs	
CO2	Solve Linear programming problem, transportation and assignment problems.	**3**	**3**	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	Solve sequencing problem, replacement problem and inventory problem.	**3**	**3**	**3**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Apply game theory problems, queuing theory in decision making.	**3**	**2**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Apply dynamic programming &simulation techniques in real-world problems.	**3**	**2**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**
Course Code	**171CS8O05-Optical Communications(Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Discover various properties of ray theory transmission and mode theory.	**1**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Analyze various attenuation mechanisms that affect the optical transmission link.	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Apply different types of fiber joints for single and multimode fibers.	**2**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Utilize optical sources and detectors based on their properties (emission wavelength, spectral widths, quantum efficiency, response time etc).	**1**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Interpret source to fiber power launching, link power and rise time budgeting, WDM system.	**2**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE8O07-Internet Of Things(Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate the need of IoT in the computing world.	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Identify the Business Process models of IoT.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Develop the communication protocols and communication technologies.	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Analyze the data storage and acquisition mechanisms for real time applications.	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Describe the involvement of cloud service model platforms in IoT.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Design an IoT application for complex problems.	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171EC8O02-Disaster Management(Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the basics of disaster management and their mitigation measures.	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Interpret the disaster vulnerability conditions of India.	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Choose the means of preparedness measures against disaster.	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Illustrate the impact of hazards on structures.	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Outline the various rehabilitation programmes to be adopted.	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

	CO Statements	POs												PSOs	
Course Code	**171CS8O07-Nano Technology and its Applications (Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the structure and properties of Nano materials.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Summarize the importance of development and fabrication of different types of Nano materials.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Illustrate various methods of synthesizing different Nano materials.	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**
CO4	Analyze the Nano structure of materials using various characterization techniques.	**3**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Make use of different Advanced Nano materials for Engineering and Technological applications.	**3**	**2**	**-**	**-**	**-**	**3**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171IT8P02-Major Project**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop technical procedure of planning and scheduling of an identified project work through technical survey in line with societal and environmental implications.	**1**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**-**	**1**	**-**	**1**	**1**
CO2	Demonstrate technical skills of data collection and data analysis adhering to professional ethics	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**1**	**1**	**1**	**1**
CO3	Design the solutions for the critical problem areas marked in data analysis	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**
CO4	Build a team of people to work together and communicate well in the critical stages of project progress.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**1**	**1**	**1**	**1**
CO5	Use modern tools to derive conclusions and communicating the results of the project work effectively	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**2**	**1**	**1**	**1**	**1**