Course Name : English for Technical Communication			Course Code : 20HS101		
CO	Course Outcomes	Unit	K-CO	POs	PSOs
C101.1	...ten, Comprehend and Correspond with others at various contexts	1-5		9,10,12	
C101.2	...ak legibly and fluently under various life-time situations by applying proper communication modules	1-5		9,10,12	
C101.3	Read and understand a variety of writings and technical text by analyzing the meaning and language	1-5		9,10,12	
C101.4	Apply clear and legible writing skills in error free style in coherent manner	1-5		9,10,12	
C101.5	Remember and use various communicative skills in precise and efficient way on technological contexts	1-5		9,10,12	
C101.6	Form situational conversations and technical writing styles for interpersonal and effective communication	1-5		9,10,12	

K Level Note:	Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), Create (PO4-K6)													
K Level →	K3	K4	K5	K6										
Course outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C101.1	-	-	-	-	-	-	-	-	3	3	-	2	-	-
C101.2	-	-	-	-	-	-	-	-	3	3	-	2	-	-
C101.3	-	-	-	-	-	-	-	-	2	3	-	2	-	-
C101.4	-	-	-	-	-	-	-	-	2	3	-	2	-	-
C101.5	-	-	-	-	-	-	-	-	3	3	-	2	-	-
C101.6	-	-	-	-	-	-	-	-	3	3	-	2	-	-

	Course Name : FUNDAMENTALS OF ENGINEERING MATHEMATICS			Course Code : 20BS101	
CO	**Course Outcomes**	**Unit**	**K-CO**	**POs**	**PSOs**
C102.1	Determine the Eigen values, Eigen vectors to diagonalize a matrix and reduce quadratic form to canonical form.	1	K3	1, 2, 3, 8&9	
C102.2	Apply the concept of limits, continuity, rules of differentiation, techniques o differentiation to differentiate standard functions.	2	K3	1, 2, 3, 8&9	
C102.3	Apply the concepts of Concavity, Convexity to determine the critical points, point of Inflection, Maxima and Minima of Single variable functions.	2	K3	1, 2, 3, 8&9	
C102.4	Compute the derivatives of functions of two variables and apply them to calculate the maxima and minima.	3	K3	1, 2, 3, 8&9	
C102.5	Determine integrals using techniques of integration, such as substitution, partial fractions and integration by parts.	4	K3	1, 2, 3, 8&9	
C102.6	Apply various techniques to solve higher order differential equations with constant and variable Coefficients.	5	K3	1, 2, 3, 8&9	

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), Create (PO4-K6)*														
K Level →	**K3**	**K4**	**K5**	**K6**											
Course outcomes ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	
C102.1	3	2	1					1	**1**						
C102.2	3	2	1					1	1						
C102.3	3	2	1					1	1						
C102.4	3	2	1					1	1						
C102.5	3	2	1					1	1						
C102.6	3	2	1					1	1						

	Course Name : ENGINEERING PHYSICS			Course Code: 20BS102		
CO	**Course Outcomes**	**Unit**	**K-CO**	**POs**		**PSOs**
C103.1	Demonstrate the properties of elasticity and measure the different moduli of elasticity	1	K3	1, 2, 3		
C103.2	Discuss the characteristics of laser and optical fiber	2	K2	1, 2, 8,9,10		
C103.3	Explain the concepts of ultrasonics in engineering	3	K2	1, 2, 8,9,10		
C103.4	Explain black body radiation, properties of matter waves and Schrodinger equation	4	K2	1, 2, 8,9,10		
C103.5	Classify the Bravais lattices and different types of crystal structures	5	K3	1, 2, 3		
C103.6	Summarize the informations on growth of crystals and deformations	5	K2	1, 2, 8,9,10		

K Level	Apply (PO1- K3), Analyze (PO2 – K4), Evaluate (PO3 – K5), Create (PO4 – KK6)													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course Outcomes ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C103.1	3	2	1											
C103.2	2	1						1	1	1				
C103.3	2	1						1	1	1				
C103.4	2	1						1	1	1				
C103.5	3	2	1											
C103.6	2	1						1	1	1				

	Course Name: Engineering Chemistry			Course Code: 20BS103	
CO	**COURSE OUTCOMES**	**Unit**	**K - CO**	**POs**	**PSOs**
C104.1	Determine the hardness of water and explain the water treatment methods.	I	K2	1,2,6,7	
C104.2	Apply Nernst equation to determine the EMF of the cell and explain various corrosion control methods.	II	K3	1,2,3,6,7	
C104.3	Describe the phase diagram of one component and two component system and various methods of heat treatment of steel.	III	K2	1,2,6,7	
C104.4	Classify the various types of fuels by their characteristics and explain the flue gas analysis by Orsat method.	IV	K2	1,2,6,7	
C104.5	Illustrate the working of Lead acid battery, lithium ion battery and fuel cell.	IV	K2	1,2,6,7	
C104.6	Describe the instrumentation and working of UV, IR, 1HNMR, HPLC and flame photometry.	V	K2	1,2,6,7	

K Level	Apply (PO1- K3), Analyze (PO2 – K4), Evaluate (PO3 – K5), Create (PO4 – KK6)													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course Outcomes ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C104.1	2	2				1	1							
C104.2	3	2	1			1	1							
C104.3	2	1												
C104.4	2	1				1	1							
C104.5	2	1				1	1							
C104.6	2	1												

20GE101 - Problem Solving using Python Programming													C105	
CO	**Course Outcomes**												**Unit**	**K –CO**
C105.1	Explain Components of a Computer System, types of programming languages, types of software with examples and purpose.												I	K3
C105.2	Perform problem analysis, use algorithms and prepare flow charts, pseudo code for solving simple problems.												I	K3
C105.3	Use Conditional, iteration constructs of python programming and apply to solve simple problems												II	K3
C105.4	Use Functions, recursive function, String functions in python programming and apply to perform linear and binary search												III	K3
C105.5	Explain the various operations for manipulating Tuples, Dictionaries and Use List toper form simple and sorting operations												IV	K3
C105.6	Explain file handling operations, exception handling, modules and packages and illustrate programs for word count, file copy, merge operations and exception handling.												V	K3

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C105.1	2	1	-	-	-	-	-	-	-	-	-	-	2	1
C105.2	2	1	-	-	-	-	-	-	-	-	-	-	2	1
C105.3	3	2	1	-	-	-	-	-	-	-	-	-	2	1
C105.4	3	2	1	-	-	-	-	-	-	-	-	-	2	1
C105.5	3	2	1	-	-	-	-	-	-	-	-	-	2	1
C105.6	3	2	1	-	-	-	-	-	-	-	-	-	2	1

	Course Name: BASIC SCIENCE LABORATORY			**Course Code:20BS1L1**	
CO	**Course Outcomes**	**Exp**	**K**	**POs**	**PSOs**
	PHYSICS				
C106.1	Calculate rigidity modulus and Young's modulus of a given material.	1,2	K3	1,2,8,9,10	
C106.2	Examine the size of a given particle, parameters of optical fiber and compute the thickness of a given thin wire.	3,6	K3	1,2,8,9,10	
C106.3	Discover the velocity of ultrasound, compressibility of a given liquid and band gap of a given semiconductor diode.	4,5	K3	1,2,8,9,10	
C106.4	Predict dispersive power of prism and wavelength of mercury spectrum.	7,8	K2	1,2,8,9,10	
	CHEMISTRY				
C106.5	Estimate the Chemical quality parameter of a water sample.	1,2,3	K3	1,2,3,8,9,10	
C106.6	Estimate the strength of acid by conductometric and pH metric titration.	4,6,7	K3	1,2,3,8,9,10	
C106.7	Estimate the amount of iron content in a given solution using potentiometer and the amount of sodium in water using flame	5,10	K3	1,2,3,8,9,10	
C106.8	Determine the molecular weight of polyvinyl alcohol using Ostwald viscometer and rate of corrosion by weight loss method. (Demo)	8,9	K2	1,2,3,8,9,10	

K Level	Apply (PO1- K3), Analyze (PO2 – K4), Evaluate (PO3 – K5), Create (PO4 – KK6)													
K Level →	K3	K4	K5	K6										
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C106.1	3	2	1					1	1	1				
C106.2	3	2	1					1	1	1				
C106.3	3	2	1					1	1	1				
C106.4	2	1						1	1	1				
C106.5	3	2	1					1	1	1				
C106.6	3	2	1					1	1	1				
C106.7	3	2	1					1	1	1				
C106.8	2	1												

		20GE1L1 - Python Programming Laboratory C107				

CO		Course Outcomes	EXP	K –CO	POs
C107.1		Develop simple Python programs using conditional and iterative constructs	1,2,7	K3	,2,3,5
C107.2		Develop simple Python programs using built-in functions and user-defined functions	3	K3	,2,3,5
C107.3		Develop a Python program using recursion to implement linear and binary search	4	K3	1,2,3,5
C107.4		Develop a Python program using list to implement selection and insertion sort	5,6	K3	1,2,3,5
C107.5		Develop Python programs to implement matrix operations	8,9	K3	1,2,3,5
C107.6		Develop a Python program to implement file handling	10,11,12	K3	1,2,3,5

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
C107.1	3	2	1	-	1	-	-	-	-	-	-	-	2	1	
C107.2	3	2	1	-	1	-	-	-	-	-	-	-	2	1	
C107.3	3	2	1	-	1	-	-	-	-	-	-	-	2	1	
C107.4	3	2	1	-	1	-	-	-	-	-	-	-	2	1	
C107.5	3	2	1	-	1	-	-	-	-	-	-	-	2	1	
C107.6	3	2	1	-	1	-	-	-	-	-	-	-	2	1	

C108	Course Name :	INDUSTRIAL PRACTICES LABORATORY	Course Code :	20GE1L2
CO		Course Outcomes	K	POs
C108.1		prepare different carpentry joints and pipe connections with different joints.	K3	1,2,3,4
C108.2		make the models using sheet metal.	K3	1,2,3,4
C108.3		carry out the basic machining operations.	K3	1,2,3,4
C108.4		prepare arc welded joints using welding equipment	K3	1,2,3,4
C108.5		Demonstrate wiring for a simple residential house; identify the ratings of tube lamp, and calculate the different Electrical quantities	K3	1,2,3,4
C108.6		Measure the electronics equipment using LCR meter, Transistor & Diode – Terminal identification using Multimeter.	K3	1,2,3,4
C108.7		Experimentally to analyze AC signal parameters using CRO and AFO and to verify the Truth tables of Logic gates.	K3	1,2,3,4
C108.8		Experimentally to design a Simple circuit using soldering in a PCB ,measure ripple factor of Half Wave Rectifier and Full Wave Rectifier.	K3	1,2,3,4

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Design (PO3-K5), synthesis (PO4-K6)*											
K Level →	K3	K4	K5	K6								
Course ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C108.1	3	1	1	1	-	-	-	-	-	-	-	-
C108.2	3	1	1	1	-	-	-	-	-	-	-	-
C108.3	3	1	1	1	-	-	-	-	-	-	-	-
C108.4	3	2	1	1	-	-	-	-	-	-	-	-
C108.5	3	2	1	1	-	-	2	-	2	2	-	-
C108.6	3	2	1	1	-	-	2	-	2	2	-	-
C108.7	3	2	1	1	-	-	2	-	2	2	-	-
C108.8	3	2	1	1	-	-	2	-	2	2	-	-

Course Name : ADVANCED TECHNICAL COMMUNICATION			Course Code : 20HS201			
Course	Course Outcomes	Unit	K-CO	POs	PSOs	
C109.1	Listen, Understand and create technical correspondence at advanced level.	1-5		9,10,12	-	
C109.2	Respond or answer to the contextual questions, interview questions, form instructions, draft reports	1-5		9,10,12	-	
C109.3	Speak and analyze social issues, come out with effective ideas for discussion, understand the passages for meaning and vocabulary	1-5		9,10,12	-	
C109.4	Assess error free technical writings, create legible and coherent technical papers, derive ideas of the given texts in a precise form	1-5		9,10,12	-	
C109.5	Remember the updated elements of communication skills, nuances of non-verbal communication, business communication	1-5		9,10,12	-	
C109.6	Create technical instructions, process instructions, self-appraisals, Resumes, reports on various situations	1-5		9,10,12	-	

K Level Note:	Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), Create (PO4-K6)													
K Level →	K3	K4	K5	K6										
Course outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C109.1	-	-	-	-	-	-	-	-	3	3	-	2	-	-
C109.2	-	-	-	-	-	-	-	-	3	3	-	2	-	-
C109.3	-	-	-	-	-	-	-	-	3	3	-	2	-	-
C109.4	-	-	-	-	-	-	-	-	2	3	-	2	-	-
C109.5	-	-	-	-	-	-	-	-	3	3	-	2	-	-
C109.6	-	-	-	-	-	-	-	-	3	3	-	2	-	-

Course Name : LAPLACE TRANSFORM AND ADVANCED CALCULUS				Course Code : 20BS201		
CO	Course Outcomes	Unit	K	POs	PSOs	
C110.1	Determine the Laplace transform of standard functions using properties	1	K3	1, 2, 3, 8&9		
C110.2	Apply Laplace transform and inverse transform to solve the initial value problems	1	K3	1, 2, 3, 8&9		
C110.3	Solve the multiple integrals and apply the concept to find areas, volumes	2	K3	1, 2, 3, 8&9		
C110.4	Determine the line, surface and volume integrals using Green's, Gauss and Stokes theorems	3	K3	1, 2, 3, 8&9		
C110.5	Determine Analytic functions, Bilinear Transformations and apply the concept of conformal mapping to find the images of given curves.	4	K3	1, 2, 3, 8&9		
C110.6	Determine the Contour Integrals using Cauchy's Integral and Residue theorems.	5	K3	1, 2, 3, 8&9		

K Level Note:	Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), create (PO4-K6)													
K Level →	K3	K4	K5	K6										
Course outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C110.1	3	2	1					1	1					
C110.2	3	2	1					1	1					
C110.3	3	2	1					1	1					
C110.4	3	2	1					1	1					
C110.5	3	2	1					1	1					
C110.6	3	2	1					1	1					

CO	Course Outcomes	Unit	K-CO	POs	PSOs
	Course Name : PHYSICS FOR INFORMATION SCIENCE			**Course Code: 20BS201**	
C111.1	Distinguish classical, quantum electron theories and energy band theory	1	K2	1,2	
C111.2	Demonstrate the semiconductors and Hall effect devices	2	K3	1,2,3,8,9,10	
C111.3	Explain magnetic properties of materials	3	K2	1,2,8,9,10	
C111.	Explain the optical properties of materials to Opto – electronic applications	4	K2	1,2,8,9,10	
C111.5	Summarize the basic operations of p - n junction devices like solar cell, LED etc	4	K2	1,2	
C111.6	Discuss different quantum structures, size effect and carbon nanotubes	5	K2	1,2,8,9,10	

K Level	Apply (PO1- K3), Analyze (PO2 – K4), Evaluate (PO3 – K5), Create (PO4 – KK6)													
K Level →	K3	K4	K5	K6										
Course Outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C111.1	2	1												
C111.2	3	2	1					1	1	1				
C111.3	2	1						1	1	1				
C111.	2	1						1	1	1				
C111.5	2	1												
C111.6	2	1						1	1	1				

Course	Course Outcome	POs
	Course Name :Engineering Graphics	**Course Code : 20GE201**
		POs
C114.1	Familiarize with the fundamentals and standards of engineering graphics.	**1,2,8**
C114.2	Draw the orthographic projections of points and lines.	**1,2,3,8**
C114.3	Draw the orthographic projections of plane surfaces.	**1,2,3,8**
C114.4	Draw the projections of simple solids like prisms, pyramids, cylinder and cone.	**1,2,3,8**
C114.5	Draw the projections of sectional views of solids and develop its lateral surfaces.	**1,2,3,8**
C114.6	Draw the isometric projection and free hand sketching of simple objects.	**1,2,3,8**

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), create (PO4-K6)*													
K Level →	K3	K4	K5	K6										
Course outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C114.1	2	1	-	-	-	-	-	1	-	-	-	-	-	-
C114.2	3	2	1	-	-	-	-	1	-	-	-	-	-	-
C114.3	3	2	1	-	-	-	-	1	-	-	-	-	-	-
C114.4	3	2	1	-	-	-	-	1	-	-	-	-	-	-
C114.5	3	2	1	-	-	-	-	1	-	-	-	-	-	-
C114.6	3	2	1	-	-	-	-	1	-	-	-	-	-	-

	Course Name : C PROGRAMMING LABORATORY			Course Code : 20CS2L1		
CO	Course Outcomes	Exp	K-CO	POs	PSOs	
C115.1	Develop simple programs using decision making and looping statements.	1-5	K3	1-3, 8-10, 12	1,2	
C115.2	Utilize array concepts to perform matrix addition, subtraction and multiplication.	6-7	K3	1-3, 8-10, 12	1,2	
C115.3	Utilize string operations and develop programs to show string copy and reverse.	8	K3	1-3, 8-10, 12	1,2	
C115.4	Develop programs using user defined functions, built-in functions and recursion.	9-12	K3	1-3, 8-10, 12	1,2	
C115.5	Develop applications using sequential and random access files.	14-15	K3	1-3, 8-10, 12	1,2	
C115.6	Develop simple real time projects using the concepts of structures and union.	13,16	K3	1-3, 8-10, 12	1,2	

K Level Note:	Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), Create (PO4-K6)													
K Level →	K3	K4	K5	K6										
Course outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C115.1	3	2	1					2	2	1		2	3	1
C115.2	3	2	1					2	2	1		2	3	1
C115.3	3	2	1					2	2	1		2	3	1
C115.4	3	2	1					2	2	1		2	3	1
C115.5	3	2	1					2	2	1		2	3	2
C115.6	3	2	1					2	2	1		2	3	2

Course Name : DISCRETE MATHEMATICS				Course Code : 20BS303	

CO	Course Outcomes	Unit	K-CO	POs	PSOs
C21.1	Apply the basic formula to formulate the normal forms and Predicate calculus.	1	K3	1, 2, 3, 8&9	
C21.2	Solve combinatorial problems using the basic counting techniques	2	K3	1, 2, 3, 8&9	
C21.3	Solve recurrence relations using generating functions.	2	K3	1, 2, 3, 8&9	
C21.4	Apply the concepts of graph theory in the computer science and technologies field.	3	K3	1, 2, 3, 8&9	
C21.5	Apply the concepts and properties of algebraic structures such as groups, rings and fields.	4	K3	1, 2, 3, 8&9	
C21.6	Determine the partial ordering, lattices as posets and Boolean algebra using logical relation.	5	K3	1, 2, 3, 8&9	

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), create (PO4-K6)*													
K Level →	K3	K4	K5	K6										
Course outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1					1	**1**					
CO2	3	2	1					1	1					
CO3	3	2	1					1	1					
CO4	3	2	1					1	1					
CO5	3	2	1					1	1					
CO6	3	2	1					1	1					

	Course Name : Digital Principles and System Design				Course Code : 20CS301	

CO	Course Outcomes	Unit	K-CO	POs	PSOs
1	Apply Arithmetic operations in any number system and various techniques to simplify the Boolean function.	1	K3	PO1,PO2,PO3	PSO1,PSO2
2	Build combinational circuits that perform arithmetic operations.	2	K3	PO1,PO2,PO3	PSO1,PSO2
3	Design and Analyze Synchronous sequential circuits such as counters and registers.	3	K4	PO1,PO2,PO3	PSO1,PSO2
4	Design and Simulate various combinational and sequential circuits using HDL.	3	K3	PO1,PO2,PO3,PO5	PSO1,PSO2
5	Analyze Asynchronous sequential circuits to find out the impact of Hazards and Races.	4	K4	PO1,PO2,PO3	PSO1,PSO2
6	Model memory arrays for any Boolean function with the help of PLA,PAL and PROM.	5	K3	PO1,PO2,PO3	PSO1,PSO2

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), Create (PO4-K6)*													
K Level →	K3	K4	K5	K6										
Course outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO202.1	3	2	1	-	-	-	-	-	-	-	-	-	1	1
CO202.2	3	2	1	-	-	-	-	-	-	-	-	-	2	1
CO202.3	3	3	2	-	-	-	-	-	-	-	-	-	2	1
CO202.4	3	2	1	-	3	-	-	-	-	-	-	-	2	1
CO202.5	3	3	2	-	-	-	-	-	-	-	-	-	1	1
CO202.6	3	2	1	-	-	-	-	-	-	-	-	-	1	1

	Course Name : DATA STRUCTURES AND ALGORITHMS	Course Code : 20CS302	

CO	Course Outcomes	Unit	K-CO	POs	PSOs
1	Explain the concept of asymptotic notations and algorithmic efficiency with properties	1	2	1,2,10	1,2
2	Describe abstract data types and implement various algorithmic problems using arrays and linked list.	1	2	1,2,12	1,2
3	Apply the different linear data structures like stack and queue to various computing problems.	2	3	1,2,3,10	1,2
4	Implement different types of trees and apply various operations on graphs and its applications.	3	2	1,2,12	1,2
5	Inspect and Analyze different sorting and searching techniques based on time and space complexity of the algorithms designed using divide and conquer methods.	4	2	1,2,10	1,2
6	Implement suitable hashing algorithm for indexing data items into specific locations in a hash table considering collision resolution techniques	5	2	1,2,12	1,2

PROGRAM SPECIFIC OUTCOMES (PSO)
Refined PSO
PSO 1: To create better learning environment in line with technological updation and research progress**.**
PSO 2: To give industry exposure through research and consultancy in Information and Communication Technologies.

Table 1.1 Course Outcomes to PO/PSO Mapping (L-1, M-2, and H-3)

COURSE OUTCOMES	PROGRAM OUTCOMES												PROGRAM SPECIFIC OUTCOMES	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	2	1								1			1	1
CO2	2	1										1	1	1
CO3	3	2	1							1			1	1
CO4	2	1										1	1	1
CO5	2	1								1			1	1
CO6	2	1										1	1	1
20NE103	**2**	**1**	**1**							**1**		**1**	**1**	**1**

	Course Name : OBJECT ORIENTED PROGRAMMING			Course Code : 20IT301		

CO	Course Outcomes	Unit	K-CO	POs	PSOs
1	Realize the Object-Oriented Programming concepts and Basics of java Programming tool	1		1,2,10	1,2
2	Apply the concepts of inheritance and interfaces using java programs	2		1,2,3,12	1,2
3	Construct java exceptions and I/O streams	3	3	1,2,3,10	1,2
4	Illustrate multithread concepts and generics in java	4	3	1,2,3,12	1,2
5	Develop interactive java application using AWT	5	3	1,2,3,10	1,2
6	Build interactive java application using Swing	5	3	1,2,3,12	1,2

PROGRAM SPECIFIC OUTCOMES (PSO)

Refined PSO

PSO 1: To create better learning environment in line with technological updation and research progress.

PSO 2: To give industry exposure through research and consultancy in Information and Communication Technologies.

Table 1.1 Course Outcomes to PO/PSO Mapping (L-1, M-2, and H-3)

COURSE OUTCOMES	PROGRAM OUTCOMES												PROGRAM SPECIFIC OUTCOMES	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	2	1	-	-						1			1	1
CO2	3	2	1	-								1	1	1
CO3	3	2	1	-						1			1	1
CO4	3	2	1	-								1	1	1
CO5	3	2	1	-						1			1	1
CO6	3	2	1									1	1	1
20IT301	**3**	**2**	**1**	**-**						**1**		**0**	**1**	**1**

	Course Name : Universal Human Values				Course Code : 20HS301	
CO	**Course Outcomes**	**Unit**	**K-CO**	**POs**		**PSOs**
20HS301.1	Explain the significance of value inputs in a classroom and summarize human aspirations.	1	AD	6, 7, 8, 9,10,12		-
20HS301.2	Distinguish between Values & Skills to ensure happiness and prosperity.	1	AD	9,10,12		-
20HS301.3	Identify the synchronization between Thyself & the Body to ensure competency of an individual	2	AD	9,10,12		-
20HS301.4	Generalize the role of a human being in ensuring harmony in society and nature.	3	AD	9,10,12		-
20HS301.5	Distinguish between ethical and unethical practices and analyze harmonious social environment.	4	AD	9,10,12		-
20HS301.6	Assess the importance of value based life and evaluate the role of professional ethics.	5	AD	9,10,12		-

AD- Affective Domain

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), Create (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course outcomes ↓	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C101.1	-	-	-	-	-	3	2	3	2	2	-	1	-	-
C101.2	-	-	-	-	-	3	2	3	2	2	-	1	-	-
C101.3	-	-	-	-	-	3	2	3	2	2	-	1	-	-
C101.4	-	-	-	-	-	3	2	3	2	2	-	1	-	-
C101.5	-	-	-	-	-	3	2	3	2	2	-	1	-	-
C101.6	-	-	-	-	-	3	2	3	2	2	-	1	-	-

	Course Name : Digital Systems LABORATORY				Course Code : 20CS3L1	
CO	Course Outcomes	Exp	K	POs	PSOs	
1	Apply Boolean simplification techniques to construct combinational logic circuits.	1,2	K3	PO1,PO2,PO3	PSO1,PSO2	
2	Build combinational logic circuits to perform arithmetic operations.	3	K3	PO1,PO2,PO3	PSO1,PSO2	
3	Implement combinational circuits using MSI devices.	4,5,6	K3	PO1,PO2,PO3	PSO1,PSO2	
4	Construct Sequential circuits like registers and counters.	7,8	K3	PO1,PO2,PO3	PSO1,PSO2	
5	Simulate combinational and sequential circuits using HDL.	9,10	K3	PO1,PO2,PO3,PO5	PSO1,PSO2	
6	Design a simple real time application using Digital system.	11	K4	PO1,PO2,PO3,PO5	PSO1,PSO2	

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), create (PO4-K6)*													
K Level →	K3	K4	K5	K6										
Course outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO206.1	3	2	1	-	2	-	-	-	-	-	-	-	1	1
CO206.2	3	2	1	-	2	-	-	-	-	-	-	-	2	1
CO206.3	3	2	1	-	2	-	-	-	-	-	-	-	1	1
CO206.4	3	2	1	-	2	-	-	-	-	-	-	-	1	1
CO206.5	3	2	1	-	2	-	-	-	-	-	-	-	1	1
CO206.6	3	3	2	1	2	-	-	-	-	-	-	-	2	1

	Course Name : 20CS3L2/ DATA STRUCTURES AND ALGORITHM LABORATORY			Course Code : 20CS3L2	

CO	Course Outcomes	Exp	K-CO	POs	PSOs
1	Compute Array implementation of stack, Queue and List ADTs using C program	1,2	K3	1, 2, 3, 8	1,2
2	Demonstrate Linked list implementation of list, Stack and Queue ADTs	3,4	K3	1, 2, 3, 8	1,2
3	Manipulate Binary trees, Binary search Trees and AVL tree and its operations	5,6,7	K3	1, 2, 3, 8	1,2
4	Compute graph representation and Traversal algorithms	8,9	K3	1, 2, 3, 8	1,2
5	Examine searching, sorting and hashing algorithms.	10,11	K4	, 2, 3,4, 8	1,2
6	Implement various techniques of Data structures to Illustrate real world problems	12	K3	1, 2, 3, 8	1,2

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), create (PO4-K6)*													
K Level →	K3	K4	K5	K6										
Course outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	-	2	-	-	-	-	-	-	-	1	1
CO2	2	2	1	-	2	-	-	-	-	-	-	-	2	1
CO3	3	2	1	-	2	-	-	-	-	-	-	-	1	1
CO4	3	2	1	-	2	-	-	-	-	-	-	-	1	1
CO5	3	2	1	-	2	-	-	-	-	-	-	-	1	1
CO6	3	2	2	1	2	-	-	-	-	-	-	-	2	1

CO	Course Outcomes	Exp	K-CO	POs	PSOs
	Course Name : 20CS3L3 / OBJECT ORIENTED PROGRAMMING LABORATORY			**Course Code : 20CS3L3**	
1	Develop and implement Java programs for simple applications that make use of classes, packages	1,2	K3	1, 2, 3,8	1,2
2	Develop and implement Java programs with inheritance and interfaces.	3,4	K3	1, 2, 3,8	1,2
3	Develop simple java programs with use of files and exceptions	5,6,7	K3	1, 2, 3,8	1,2
4	Develop simple java programs by implementing multithread concepts and generics	8,9	K3	1, 2, 3,8	1,2
5	Design and Develop interactive java application using AWT and Swing .	10,11	K6	1, 2, 3,4,8	1,2
6	Design and develop of mini project	12	K6	1, 2, 3,4, 8	1,2

PROGRAM SPECIFIC OUTCOMES (PSO)

Refined PSO

PSO 1: To create better learning environment in line with technological updation and research progress**.**

PSO 2: To give industry exposure through research and consultancy in Information and Communication Technologies.

Table 1.1 Course Outcomes to PO/PSO Mapping (L-1, M-2, and H-3)

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), Create (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course outcomes ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
1	3	2	1	-	-	-	-	2	-	-	-	-	1	1
2	3	2	1	-	-	-	-	2	-	-	-	-	1	1
3	3	2	1	-	-	-	-	2	-	-	-	-	1	1
4	3	2	1	-	-	-	-	2	-	-	-	-	1	1
5	3	3	2	1	-	-	-	2	-	-	-	-	1	1
6	3	3	2	1	-	-	-	2	-	-	-	-	1	1
20CS3L3	3	2	1	1				2					1	1

	Course Name : PROBABILITY AND STATISTICS			Course Code : 20BS404	
CO	**Course Outcomes**	**Unit**	**K-CO**	**POs**	**PSOs**
C29.1	Build the parameters of statistical distributions using basic probability theory concepts.	1	K3	1, 2, 3, 8&9	
C29.2	Calculate the statistical measures for two dimensional random variables.	2	K3	1, 2, 3, 8&9	
C29.3	Apply the concepts of testing of hypothesis for large samples.	3	K3	1, 2, 3, 8&9	
C29.4	Apply t-test , chi-square and F- Test for small samples.	3	K3	1, 2, 3, 8&9	
C29.5	Apply the basic concepts of design of experiments in the field of agriculture.	4	K3	1, 2, 3, 8&9	
C29.6	Use control charts for quality control problems.	5	K3	1, 2, 3, 8&9	

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), create (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course outcomes ↓	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PO11**	**PO12**	**PSO 1**	**PSO2**
CO1	3	2	1					1	1					
CO2	3	2	1					1	1					
CO3	3	2	1					1	1					
CO4	3	2	1					1	1					
CO5	3	2	1					1	1					
CO6	3	2	1					1	1					

	Course Name : Computer Organization and Architecture			Course Code : 20CS401	
CO	**Course Outcomes**	**Unit**	**K-CO**	**POs**	**PSOs**
CO401.1	plain the computer organization components, instructions and addressing modes	1	K2	1,2,3,4,5	1,2
CO401.2	Compute the arithmetic operations such as Addition, Subtraction, Multiplication & Division	2	K3	1,2,3,4,5	1,2
CO401.3	Discuss the basics of MIPS implementation and pipelining	3	K2	1,2,3,4,5	1,2
CO401.4	Illustrate the basic concepts of parallelism, multi-core processor, GPU & Clusters	4	K2	1,2,3,4,5	1,2
CO401.5	Describe the memory technologies & I/O systems	5	K2	1,2,3,4,5	1,2
CO401.6	Generalize the memory systems using Raspberry-pi	5	K2	1,2,3,4,5	1,2

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), Create (PO4-K6)*													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course outcomes ↓	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO401.1	3	2	1	1	2	-	-	-	-	-	-	-	3	3
CO401.2	3	2	1	1	2	-	-	-	-	-	-	-	3	3
CO401.3	3	3	2	2	1	-	-	-	-	-	-	-	3	3
CO401.4	3	3	2	1	1	-	-	-	-	-	1	-	3	3
CO401.5	3	3	2	1	1	1	-	-	-	-	1	-	2	3
CO401.6	3	2	1	1	2	-	-	-	-	-	-	-	2	3
CO	**3**	**2**	**1**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**1**	**-**	**3**	**3**

	Course Name : DATABASE MANAGEMENT SYSTEMS			Course Code : 20IT301		

CO	Course Outcomes	Unit	K-CO	POs	PSOs
1	Compare File Processing System with Database and summarize the basic concepts of Database, various Data Models and Database System Architecture.	1	2	1,2,10	1,2
2	Identify Entities, Attributes and their Relationships to prepare ER diagram for real time applications.	2	3	1,2,3,12	1,2
3	Transform an information model into a relational database schema and use DDL, DML, DQL, DCL, TCL and advanced concepts of SQL to implement the schema.	3	3	1,2,3,10	1,2
4	Develop simple database using XML and relate advanced databases with relational model.	4	3	1,2,3,12	1,2
5	Design a database by identifying dependencies and optimize it with suitable normal forms to reduce redundancy.	5	4	1,2,3,10	1,2
6	Compare real time applications with respect to transaction, concurrency control, and data object locking protocols and select appropriate storage and recovery techniques and identify query processing and query optimization techniques	5	4	1,2,3,12	1,2

PROGRAM SPECIFIC OUTCOMES (PSO)

Refined PSO

PSO 1: To create better learning environment in line with technological updation and research progress.

PSO 2: To give industry exposure through research and consultancy in Information and Communication Technologies.

Table 1.1 Course Outcomes to PO/PSO Mapping (L-1, M-2, and H-3)

COURSE OUTCOMES	PROGRAM OUTCOMES												PROGRAM SPECIFIC OUTCOMES	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	2	1	-	-						1			1	1
CO2	3	2	1	-								1	1	1
CO3	3	2	1	-						1			1	1
CO4	3	2	1	-								1	1	1
CO5	3	3	2	1						1			1	1
CO6	3	3	2	1								1	1	1
20CS402	**3**	**2**	**1**	**-**						**1**		**0**	**1**	**1**

Course Name : DESIGN AND ANALYSIS OF ALGORITHMS				Course Code : 20IT401	

CO	Course Outcomes	Unit	K-CO	POs	PSOs
1	Recognize different algorithm design techniques for solving various problems.	1	2	1,2,10	1,2
2	Analyze the recursive and non-recursive algorithms	1	2	1,2,12	1,2
3	Design and analyse of different problems under divide and conquer methodology and brute force techniques	2	3	1,2,3,10	1,2
4	Design and analyse the various problems under greedy algorithm and dynamic programming	3	2	1,2,12	1,2
5	Design and analyse the various problems under iterative algorithms.	4	2	1,2,10	1,2
6	Analyse the limitations of various algorithmic methodologies..	5	3	1,2,12	1,2

PROGRAM SPECIFIC OUTCOMES (PSO)

Refined PSO

PSO 1: To create better learning environment in line with technological updation and research progress**.**
PSO 2: To give industry exposure through research and consultancy in Information and Communication Technologies.

Table 1.1 Course Outcomes to PO/PSO Mapping (L-1, M-2, and H-3)

COURSE OUTCOMES	PROGRAM OUTCOMES												PROGRAM SPECIFIC OUTCOMES	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	2	1								1			1	1
CO2	2	1										1	1	1
CO3	3	2	1							1			1	1
CO4	2	1										1	1	1
CO5	2	1								1			1	1
CO6	3	2	1									1	1	1
20NE103	**2**	**1**	**1**							**1**		**1**	**1**	**1**

	Course Name: **Environmental Science and Engineering**	Course Code: **20HS401**			

CO	COURSE OUTCOMES	Unit	K - CO	POs	PSOs
C214.1	Describe the environment, ecosystem and their significances.	I	K2	6,7	
C214.2	Explain the threats to biodiversity.	I	K2	6,7	
C214.3	Describe the sources, effects, control methods of environmental pollution.	II	K2	6,7	
C214.4	Explain the knowledge on various natural resources and its effect on environment due to over utilization.	III	K2	6,7	
C214.5	Describe the disposal techniques of solid waste and record the consequences of natural disasters.	IV	K2	6,7	
C214.6	Outline the social issues as welfare, sustainability etc., and relate with population growth.	V	K2	6,7	

K Level Note	Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), Create (PO4-K6)													
K Level →	**K3**	**K4**	**K5**	**K6**										
Course Outcomes↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1						2	3							
2						2	3							
3						2	3							
4						2	3							
5						2	3							
6						2	3							

	Course Name : OPERATING SYSTEMS		Course Code : 20CS404	

CO	Course Outcomes	Unit	K-CO	POs	PSOs
1	Apply the basic functions of Operating System and Process communications.	1	3	1,2,3,8,10	1
2	Analyze the performance of CPU scheduling algorithms specifically FCFS, SJF, Priority and Round Robin.	2	4	,2,3,4,8,12	1
3	Apply various process synchronization methods and deadlock avoidance algorithm for a given scenario.	3	3	1,2,3,8	1
4	Design memory management schemes using paging and segmentation	4	4	,2,3,4,8,12	1,2
5	Execute various file allocation methods and directory structures.	5	4	,2,3,4,8,12	1,2
6	Classify different operating systems and make use of virtualization platform to build virtual machines.	5	4	,2,3.4.8.10	1,2

PROGRAM SPECIFIC OUTCOMES (PSO)

Refined PSO
PSO 1: To create better learning environment in line with technological updation and research progress**.**
PSO 2: To give industry exposure through research and consultancy in Information and Communication Technologies.

Table 1.1 Course Outcomes to PO/PSO Mapping (L-1, M-2, and H-3)

COURSE OUTCOMES	PROGRAM OUTCOMES												PROGRAM SPECIFIC OUTCOMES	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	-	-	-	-	2	-	1	-	-	2	-
CO2	3	3	2	1	-	-	-	2	-	-	-	1	2	-
CO3	3	2	1	-	-	-	-	2	-	-	-	-	2	-
CO4	3	3	2	1	-	-	-	2	-	-	-	1	2	1
CO5	3	3	2	1	-	-	-	2	-	-	-	1	2	1
CO6	3	3	2	1	-	-	-	2	-	1	-	-	2	2
20CS404	3	3	2	1	-	-	-	2	-	-	-	1	2	1

	Course Name : Database Management System Laboratory			Course Code : 20CS4L1	

CO	Course Outcomes	Exp	K-CO	POs	PSOs
1	velop simple Database using DDL, DML and TCL commands.	1,2 ,3	K3	1, 2, 3,8	1,2
2	eate Relational Database for real time application through Database constraints.	5,6	K3	1, 2, 3,8	1,2
3	rite and execute complex queries using subqueries and join queries	4	K3	1, 2, 3,8	1,2
4	velop PL/SQL programs to implement simple logics using Stored Procedure, Functions, Triggers and Cursor.	7,8,9,10	K3	1, 2, 3,8	1,2
5	sign a front end application to display forms, menu and reports.	11	K3	1, 2, 3,4,8	1,2
6	sign real time applications with Database Connectivity.	12	K3	1, 2, 3,4, 8	1,2

PROGRAM SPECIFIC OUTCOMES (PSO)
Refined PSO
PSO 1: To create better learning environment in line with technological updation and research progress**.**
PSO 2: To give industry exposure through research and consultancy in Information and Communication Technologies.

Table 1.1 Course Outcomes to PO/PSO Mapping (L-1, M-2, and H-3)

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), Create (PO4-K6)*													
K Level →	K3	K4	K5	K6										
Course outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1	-	-	-	-	2	-	-	-	-	1	1
2	3	2	1	-	-	-	-	2	-	-	-	-	1	1
3	3	2	1	-	-	-	-	2	-	-	-	-	1	1
4	3	2	1	-	-	-	-	2	-	-	-	-	1	1
5	3	3	2	1	-	-	-	2	-	-	-	-	1	1
6	3	3	2	1	-	-	-	2	-	-	-	-	1	1
20CS4L1	3	2	1	1				2					1	1

CO	Course Outcomes	Exp	K	POs	PSOs
	Course Name : PROFESSIONAL COMMUNICATION LABORATORY			**Course Code : 20HS4L2**	
1	ten and Respond global English appropriately	1,2		9,10,12	-
2	rticipate in group discussions towards placement drive	3,4		9,10,12	-
3	ke effective presentations of technical topics	5,6		9,10,12	-
4	mmunicate with effective technological skills	7,8		9,10,12	-
5	ad and Write the context cohesively and coherently and organize ideas logically in workplace situations	9,10		9,10,12	-
6	end job interviews and be successful in them	1-10		9,10,12	-

CO-PO Mapping

K Level *Note:*	*Apply (PO1-K3), Analyze (PO2-K4), Evaluate (PO3-K5), create (PO4-K6)*													
K Level →	K3	K4	K5	K6										
Course outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	2	3	-	3	-	-
CO2	-	-	-	-	-	-	-	-	2	3	-	3	-	-
CO3	-	-	-	-	-	-	-	-	3	3	-	3	-	-
CO4	-	-	-	-	-	-	-	-	2	3	-	3	-	-
CO5	-	-	-	-	-	-	-	-	3	3	-	3	-	-
CO6	-	-	-	-	-	-	-	-	2	3	-	3	-	-