DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

CO PO PSO MAPPING

MAT 101	LINEAR ALGEBRA AND	L	Т	Р	CREDIT	Year of Introduction
	CALCULUS	3	1	0	4	2019

Course Outcomes: After completion of the course the student will be able to:

CO 1	Solve systems of linear equations, diagonalize matrices and characterize quadratic forms
CO2	Compute the partial and total derivatives and maxima and minima of multivariable functions.
СО3	Compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and center of gravity of plane laminas
CO4	Perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent
C05	Determine the Taylor and Fourier series expansion of functions and learn their applications.

Mapping of course outcomes with program outcomes (Minimum requireme

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	РО 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	3	3	3	3	2	1	-	-	1	2	-	2	1	-	-
CO 2	3	3	3	3	2	1	-	-	1	2	-	2	-	-	-
CO 3	3	3	3	3	2	1	-	-	1	2	-	2	-	-	-
CO 4	3	2	3	2	1	1	-	-	1	2	-	2	1	-	-
CO 5	3	3	3	3	2	1	-	-	1	2	-	2	-	-	-
Aver age	3	2.8	3	2.8	1.8	1	-	-	1	2	-	2	0.4	-	-

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PHT 100	ENGINEERING PHYSICS A	L	Т	Р	CREDIT	Year of Introduction
		3	1	0	4	2019

No.	Course outcomes	Knowledge Level
CO 1	Compute the quantitative aspects of waves and oscillations in engineering systems.	K3
CO 2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.	К3
CO 3	Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.	К2
CO 4	Classify the properties of magnetic materials and apply vector calculus to static magnetic fields and use Maxwell's equations to diverse engineering problems	K3
CO 5	Analyze the principles behind various superconducting applications, explain the working of solid state lighting devices and fibre optic communication system	K2

со	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	РО 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	3	2	-	-	-	-	-	1	2	-	-	1	1	-	-
CO 2	3	2	-	-	-	-	-	1	2	-	-	1	-	-	-
CO 3	3	2	-	-	-	-	-	1	2	-	-	1	1	-	-
CO 4	3	1	-	-	-	-	-	1	2	-	-	1	1	-	-
CO 5	3	1	-	-	-	-	-	1	2	-	-	1	1	-	-
Average	3	1.6	-	-	-	-	-	1	2	-	-	1	1	-	-

FST	ENGINEERING	L	Т	Р	CREDIT	Year of Introduction
100	MECHANICS	2	1	0	3	2019

Course Outcomes: After completion of the course the student will be able to:

EST100.1	Recall principles and theorems related to rigid body mechanics
EST100.2	Identify and describe the components of system of forces acting on the rigid body.
EST100.3	Apply the conditions of equilibrium to various practical problems involving different force system
EST100.4	Choose appropriate theorems, principles or formulae to solve problems of mechanics
EST100.5	Solve problems involving rigid bodies, applying the properties of distributed areas and masses

	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	2	-	-	-	-	-	-	-	-	-	-		
CO2	3	3	-	-	-	-	-	-	-	-	-	-		
CO3	3	3	-	-	-	-	-	-	-	-	-	-		
CO4	3	3	-	-	-	-	-	-	-	-	-	-	1	
CO5	3	3	-	-	-	-	-	-	-	-	-	-	1	
EST100	2.80	2.80	-	-	-	-	-	-	-	-	-	-	1	

EST 130	BASICS OF ELECTRICAL &	L	Т	Р	CREDIT	Year of Introduction
	ELECTRONICS	4	0	0	4	2019

No.	Course outcomes	Knowledge Level
CO1	Apply fundamental concepts and circuit laws to solve simple DC electric circuits.	K3
CO2	Develop and solve models of magnetic circuits.	K3
CO3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state.	К3
CO 4	Describe working of a voltage amplifier	K2
CO 5	Outline the principle of an electronic instrumentation system	K2
CO 6	Explain the principle of radio and cellular communication	K2

	PO	PO	РО	РО	РО	PO	РО	РО	PO	PO	PO	PO	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	1										2		
CO2	3	1										2		
CO3	3	1										2		
CO 4	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 5	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO 6	2	_	_	-	-	-	-	-	-	-	-	2	_	-
EST 130														

	LIFE SKILLS	L	Т	Р	CREDIT	Year of Introduction
ΠΟΙΝΙΟΙ		2	0	2	4	2019

No.	Course outcomes	Knowledg e Level
CO1	Define and identify different life skills required in personal and professional life	K ₃
CO2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.	K ₃
CO3	Explain the basic mechanics of effective communication and demonstrate these through presentations	K ₂
CO4	Take part in group discussions	K ₅
CO5	Use appropriate thinking and problem-solving techniques to solve new problems	K ₃
CO6	Understand the basics of teamwork and leadership	K ₆

	PO	PO	PO	РО	PO	РО	PO	PO	PO	РО	PO	PO	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	-	-	1	-	3	-	2	-	2
CO2	-	-	-	-	-	-	-	-	-	1	-	3	-	2
CO3	-	-	1	-	-	1	-	-	1	3	-	-	-	
CO4	-	-	-	-	-	-	-	-	-	3	-	1	-	-
CO5	-	-	1	-	-	-	-	-	2	3	-	-	-	-
CO6	1	-	-	-	-	1	-	-	1	3	-	_	-	-
	1	-	1	-	-	1	-	1	1	3	-	2	-	-

DUI 120	ENGINEERING	L	Т	Р	CREDIT	Year of Introduction
1111120	PHYSICS LAB	0	0	2	2	2019

No.	Course outcomes	Knowledge Level
CO 1	Develop analytical/experimental skills and impart prerequisite hands on experience for engineering laboratories	КЗ
CO 2	Understand the need for precise measurement practices for data recording	КЗ
CO 3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations	КЗ
CO 4	Analyze the techniques and skills associated with modern scientific tools such as lasers and fiber optics	КЗ
CO 5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results	К2

со	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	-	-	-	3	-	-	1	2	-	-	1	1	-	-
CO 2	3	-	-	-	3	-	-	1	2	-	-	1	1	-	-
CO 3	3	-	-	-	3	-	-	1	2	-	-	1	-	-	-
CO 4	3	-	-	-	3	-	-	1	2	-	-	1	1	1	-
CO 5	3	-	-	-	3	-	-	1	2	-	-	1	1	1	-
Average	3	-	-	-	3	-	-	1	2	-	-	1	1	1	-

ESI 130	ELECTRICAL AND	L	Т	Р	CREDIT	Year of Introduction
LSLISU	WORKSHOP	0	0	2	2	2019

No.	Course outcomes	Knowledg e Level
CO1	Demonstrate safety measures against electric shocks	K1
CO2	Identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols	K2
CO3	Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings	K2
CO4	Identify and test various electronic components	K ₂
CO5	Draw circuit schematics with EDA tools	K ₂
CO6	Assemble and test electronic circuits on boards	K ₂
CO7	Work in a team with good interpersonal skills	

	PO 1	Р О 2	Р О 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1						3						1		
CO2	2									1				
CO3	2			1		1		1	2	2		2		
CO4	3				1				2			2		
CO5	3				2			2	2			2		
CO6	3				2				2			1		
C07									3	2		2		

мат	VECTOR CALCULUS DIFFE	L	Т	Р	CREDIT	Year of Introduction
102	RENTIAL	3	1	0	4	2019
	EQUATIONS AND TRANSFORMS					

CO 1	Compute the derivatives and line integrals of vector functions and learn their applications
CO 2	Evaluate surface and volume integrals and learn their inter relations and application
CO 3	Solve homogeneous and non- homogeneous linear differential equation with constant coefficient
CO 4	Compute Laplace transform and apply them to solve ODEs arising in engineering
CO 5	Determine the Fourier transform of functions and apply them to solve problems arising in engineering

Mapping of course outcomes with program outcomes

	PO	РО	РО	PO	PSO	PSO								
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO 1	3	3	3	3	2	1	-	-	1	2	-	2	1	
CO 2	3	3	3	3	2	1	-	-	1	2	-	2	1	
CO 3	3	3	3	3	2	1	-	-	1	2	-	2	1	
CO 4	3	3	3	3	2	1	-	-	1	2	-	2	1	
CO 5	3	3	3	3	2	1	-	-	1	2	-	2	1	

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CVT	ENGINEERING	L	Т	Р	CREDIT	Year of Introduction
100	CHEMISTRY	3	1	0	4	2019

CO 1	Apply the basic concepts of electrochemistry and corrosion to explore its
	possible applications in various engineering fields.
CO 2	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications
CO 3	Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of SEM for surface
	characterization of nanomaterials
CO 4	Learn about the basics of stereochemistry and its application. Apply the
	knowledge of conducting polymers and advanced polymersin engineering
CO 5	Study various types of water treatment methods to develop skills for treating waste water.

	P 0 1	P O 2	Р О З	Р О 4	Р О 5	Р О 6	Р О 7	Р О 8	Р О 9	РО 10	РО 11	РО 12	PSO 1	PS O 2
CO 1	1	2	1											
CO 2	1	1		1	2									
CO 3	1	1		1	2									
CO 4	2	1												
CO 5	1			1			3							

EST 120	BASICS OF CIVIL	L	Т	Р	CREDIT	Year of Introduction
	& MECHANICAL ENGINEERING	4	0	0	4	2019

CO1	Recall the role of civil engineer in society and to relate the various disciplines of civil engineering
CO2	Explain different types of buildings, building components, building materials and building construction
CO3	Describe the importance, objectives and principles of surveying
CO4	Summarize the basic infrastructure services MEP, HVAC, elevators, escalators and ramps
CO5	Discuss the materials, energy systems, water management and environment for green buildings
CO6	Analyse thermodynamic cycles and calculate its efficiency
CO7	Illustrate the working and features of IC Engines.
CO8	Explain the basic principles of Refrigeration and Air Conditioning.
CO9	Describe the working of hydraulic machines
CO10	Explain the working of power transmission elements.
CO11	Describe the basic manufacturing, metal joining and machining processes

Mapping of course outcomes with program outcomes

	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	-	-	-	-	3	2	2	-	-	-	-	-	-
CO2	3	2	-	1	3	-	-	3	-	-	-	-	-	-
CO3	3	2	-	-	3	-	-	-	2	-	-	-	-	-
CO4	3	2	-	-	3	-	-	-	2	-	-	-	-	-
CO5	3	2	-	-	3	2	3	-	2	-	-	-	-	-
CO6	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO7	3	1	-	-	-	-	-	-	-	-	-	-	-	-
CO8	3	1	-	-	-	-	-	-	-	-	-	-	-	-
CO9	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO10	3	1	-	-	-	-	-	-	-	-	-	-	-	-
CO11	3	-	-	-	-	-	-	-	-	-	-	-	-	-
AVG.	3	1.6 7	-	1	3	2.5	2.5	2.5	2	-	-	-	-	-

HUN	PROFESSIONAL	L	Т	Р	CREDIT	Year of Introduction
101 102	COMMUNICATION	2	0	2	4	2019

No.	Course outcomes	Knowledge Level
CO1	Develop vocabulary and language skills relevant to engineering as a professional	K,
CO2	Analyze, interpret & effectively summarize a variety of textual content	K ₃
CO3	Create effective technical presentation	K ₃
CO4	Discuss a given technical /non-technical topics in a group setting and arrive at generalization /consensus	K,
CO5	Identify drawbacks in listening patterns and apply listening techniques for specific needs	К,
CO6	create professional & technical document that are clear and adhering to all the necessary conventions	К,

	PO	РО	PSO	PSO										
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	2	-	-	2	2	1	3	-	
CO2	1	1	-	-	-	-	-	-	3	-	-	3	-	1
CO3	-	-	-	-	-	1	-	-	1	3	1	-	-	1
CO4	1	2	-	-	-	-	-	-	-	2	1	1	-	1
CO5	-	3	2	1	-	-	-	-	-	1	-	1		-
CO6														
CO7						1			2	3		1		1

EST 102	PROGRAMMING	L	Т	Р	CREDIT	Year of Introduction
	INC	2	1	2	4	2019

No.	Course outcomes	Knowledge Level
C01	Analyze a computational problem and develop an algorithm/flowchart to find its solution	K ₃
CO2	Develop readable C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators.	K,
CO3	Write readable C programs with arrays, structure or union for storing the data to be processed	K ₃
CO4	Divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if required, to find the solution to the computational problem	Κ,
C05	Write readable C programs which use pointers for array processing and parameter passing	K ₃
CO6	Develop readable C programs with files for reading input and storing output	K,

PO					PSO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO														
CO1	3	3	3	2	-	2	I	I	-	3	3	3	3	-
CO2	3	3	3	2	2	-	-	-	-	2	-	3	3	-
CO3	3	3	3	1	2	-	-	-	-	2	-	3	3	-
CO4	3	3	3	1	2	-	-	-	-	2	3	3	3	-
CO5	3	3	-	-	2	-	-	-	-	1	-	3	3	-
CO6	3	3	-	-	2	-	-	-	-	1	-	3	3	-
AVG	3	3	3	1.5	2	2	-	-	-	1.83	3	3	3	-

EST 110	ENGINEERING	L	Т	Р	CREDIT	Year of Introduction
	GRAPHICS	2	0	2	3	2019

No.	Course outcomes	Knowledge Level
CO1	Draw the projection of points and lines located in different quadrants	K3
CO2	Prepare multiview orthographic projections of objects by visualizing them in different positions	К3
CO3	Draw sectional views and develop surfaces of a given object	К3
CO4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.	К3
CO5	Convert 3D views to orthographic views	К3
CO6	Obtain multiview projections and solid models of objects using CAD tools	К3

	PO	PO	PO	РО	РО	PO	PO	PO	PO	РО	РО	PO	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	-	-	-	-	-	-	-	-	-	-	-		
CO2	3	-	-	-	-	-	-	-	-	-	-	-		
CO3	3	1	-	-	-	-	-	-	-	-	-	-		
CO4	3	-	-	-	-	-	-	-	-	1	-	-		
CO5	3	-	-	-	-	-	-	-	-	2	-	-		
CO6	3	-	-	-	3	-	-	-	-	3	_	_		
	3	1	-	-	3	-	-	-	-	2	-	-		

CVI	ENGINEERING	L	Т	Р	CREDIT	Year of Introduction
120		0	0	2	1	2019

CO 1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses.
CO 2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
CO 3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds.
CO 4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis.
CO 5	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.
CO 6	Function as a member of team, communicate effectively and engage in future learning. Also understand how chemistry addresses social, economical, and environmental problems and why it is an integral part of curriculum.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PSO 2
CO1	3	-	-	-	2	-	-	-	-	-	-	3	-	1
CO2	3	-	-	-	3	-	-	-	-	-	-	3	1	-
CO3	3	-	-	-	3	-	-	-	I	-	-	3	1	-
CO4	3	-	-	-	3	-	-	-	-	-	-	3	-	-
CO5	3	-	-	-	1	-	-	-	-	-	-	3	-	-
CO6	3	-	-	-	1	-	-	-	-	-	-	3	-	-
Avg.	3	-	-	-	2	-	-	-	-	-	_	3	1	1

FSI 120	CIVIL AND	L	Т	Р	CREDIT	Year of Introduction
	WORKSHOP	0	0	2	1	2019

CO1	Name different devices and tools used for civil engineering measurements
CO2	Explain the use of various tools and devices for various field measurements
CO3	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work.
CO4	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.
CO5	Compare different techniques and devices used in civil engineering measurements
CO6	Identify Basic Mechanical workshop operations in accordance with the material and objects
CO7	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades
CO8	Apply appropriate safety measures with respect to the mechanical workshop trades

СО	PO 1	PO 2	PO 3	P 0 4	P 0 5	PO 6	РО 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	1	-	-	-	1	1	-	-	2	2	-	-	-	-
CO2	1	-	-	-	1	1	-	-	2	2	-	-	-	-
CO3	1	-	-	-	1	1	-	2	2	2	-	-	-	-
CO4	1	-	-	-	1	1	-	2	2	2	-	-	-	-
CO5	1	-	-	-	1	1	-	-	2	2	-	-	-	-
CO6	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO7	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO8	2	-	-		-	-	-	-	-	-	-	-	-	_
AVG.	1				1	1		2	2	2				

MAT203	DISCRETE MATHEMATICAL STRUCTURES	L	Т	Р	CREDIT	Year of Introduction
		3	1	0	4	2019

No.	Course outcomes	Knowledge Level
CO1	Check the validity of predicates in propositional and quantified propositional logic using truth tables, deductive reasoning and inference theory on propositional logic.	К3
CO2	Solve counting problems by applying elementary counting techniques rule of sum, rule of product, permutation, combination, binomial theorem, pigeonhole principle and principle of inclusion and exclusion principal	K3
CO3	Classify binary relations into various types and illustrate an application for each type of binary relation in computer science	К3
CO4	Illustrate an application for partially ordered sets and complete lattices in computer science	К3
CO5	Explain the generating functions and solve first order and second order linear recurrence relations with constant coefficients	К3
CO6	Illustrate abstract algebraic system - semigroups, monoids, groups homomorphisms and isomorphisms of monoids and groups	К3

	PO1													PC	03
со	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO1	PO1	PO1	PSO	PSO	PSO
	1	2	3	4	5	6	7	8	9	0	1	2	1	2	3
CO1	3	2	2	2	-	-	-	-	-	-	-	2	1	-	-
CO2	3	2	2	2	-	-	-	-	-	-	-	2	1	-	-
CO3	3	2	2	2	-	2	-	-	-	-	-	2	1	-	-
CO4	3	2	2	2	-	2	-	-	-	-	-	2	1	-	-
CO5	3	2	2	2	-	-	-	-	-	-	-	2	1	-	-
CO6	3	2	2	2	-	-	-	-	-	-	-	2	1	-	-
AV G	3	2	2	2	-	2	-	-	-	-	-	2	1	-	_

CST 201	DATA STRUCTURES	L T P CR		CREDIT	Year of Introduction	
	SIKUCIUKES	3	1	0	4	2019

со	Course outcome	Knowledge level
CO1	Design an algorithm for a computational task and calculate the time/space complexities of that algorithm .	K3
CO2	Identify the suitable data structure (array or linked list) to represent a data item required to be processed to solve a given computational problem and write an algorithm to find the solution of the computational problem.	К3
CO3	Write an algorithm to find the solution of a computational problem by selecting an appropriate data structure (binary tree/graph) to represent a data item to be processed.	K3
CO4	Store a given dataset using an appropriate Hash Function to enable efficient access of data in the given set.	K3
CO5	Select appropriate sorting algorithms to be used in specific circumstances.	K4
CO6	Design and implement Data Structures for solving real world problems efficiently.	K3

РО		Program outcomes													
со	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	2	1	1	-	1	-	-	-	-	-	3	2	-	
CO2	3	3	3	2	-	1	-	-	-	-	-	3	2	-	
CO3	3	3	3	2	-	1	-	-	-	-	-	3	2	-	
CO4	3	3	3	1	-	1	-	-	-	-	-	3	2	-	
CO5	2	2	2	1	-	1	-	-	-	-	-	3	2	-	
CO6	3	3	3	2	-	1	-	-	-	-	-	3	2	-	

CST 203	LOGIC SYSTEM	L	Т	Р	CREDIT	Year of Introduction
CSI 205	DESIGN	3	1	0	4	2019

No.	Course outcomes	Knowledge Level
CO1	Illustrate decimal, binary, octal, hexadecimal and BCD number systems, perform conversions among them and do the operations - complementation, addition, subtraction, multiplication and division on binary numbers	K2
CO2	Simplify a given Boolean Function and design a combinational circuit to implement the simplified function using Digital Logic Gates	К3
CO3	Design combinational circuits - Adders, Code Convertors, Decoders, Magnitude Comparators, Parity Generator/Checker and design the Programmable Logic Devices ROM and PLA.	К2
CO4	Design sequential circuits - Registers, Counters and Shift Registers.	K3
CO5	Use algorithms to perform addition and subtraction on binary, BCD and floating point numbers	К3

	РО	PO	PSO1	PSO2										
	1	2	3	4	5	6	7	8	9	10	11	12		
CO1	3	3	-	-	-	-	-	-	-	-	-	-	-	2
CO2	3	3	3	-	-	2	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	1	-	-	-	-	-	-	-	-
CO4	3	3	3	-	-	3	-	-	-	-	-	-	-	2
C05	3	3	3	-	-	-	-	-	-	-	-	-	-	2

CST 205	OBJECT	L	Т	Р	CREDIT	Year of Introduction
	ORIENTED PROGRAMMING USING JAVA	3	1	0	4	2019

No.	Course outcomes	Knowledge Level
CO1	Write Java programs using the object oriented concepts - classes, objects, constructors, data hiding, inheritance and polymorphism.	К3
CO2	Utilize datatypes, operators, control statements, built in packages & interfaces, Input/ Output Streams and Files in Java to develop programs	К3
CO3	Illustrate how robust programs can be written in Java using exception handling mechanism	К3
CO4	Write application programs in Java using multithreading and database connectivity.	K3
CO5	Write Graphical User Interface based application programs by utilizing event handling features and Swing in Java	К3
CO6	Apply the knowledge of software engineering methods, such as object oriented analysis and design methods with a clear emphasis on UML	К3

РО				PSO	C									
со	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	РО 9	PO1 0	PO1 1	PO1 2	PSO1	PSO2
CO1	1	2	2	1	-	-	-	-	-	-	-	3	2	
CO2	1	2	2	1	-	-	-	-	-	-	-	3		
CO3	1	1	2	1	-	-	-	-	-	1		3		
CO4	2	2	3	1	-	-	-	-	-	-	-	3	2	1
CO5	2	2	3	1								3		
CO6	1	2	3	1								3	1	1
AVG	1.3 3	1.8 3	2.5	1						1		3		

HUT200	PROFESSIONAL ETHICS	L	Т	Р	CREDIT	Year of Introduction
		2	0	0	2	2019

СО	Course outcome	Knowledge level
CO1	Understand the core values that shape the ethical behaviour of a professional.	K2
CO2	Adopt a good character and follow an ethical life.	K3
CO3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.	K2
CO4	Solve moral and ethical problems through exploration and assessment by established experiments.	K2
CO5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.	К3

РО		Programme outcomes													
со	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	-	-	-	-	-	-	-	2	-	-	2	-	-	2	
CO2	-	-	-	-	-	-	-	2	-	-	2	-	-	2	
CO3	-	-	-	-	-	-	-	3	-	-	2	-	-	3	
CO4	-	-	-	-	-	-	-	3	-	-	2	-	-	3	
CO5	-	-	-	-	-	-	-	3	-	-	2	-	-	3	
AVG	-	-	-	-	-	-	-	2.6	-	-	2	-	-	-	

MCN201	SUSTAINABLE	L	Т	Р	CREDIT	Year of Introduction
1/10/1/201	ENGINEERING	2	0	0	2	2019

No.	Course outcomes	Knowledge Level
CO1	Understand the relevance and the concept of sustainability and the global initiatives in this direction	K2
CO2	Explain the different types of environmental pollution problems and their sustainable solutions	К2
CO3	Discuss the environmental regulations and standards	K2
CO4	Outline the concepts related to conventional and non-conventional energy	K2
CO5	Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles	К3

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	-	-	-	-	-	2	3	-	-	-	-	2		
CO2	-	-	-	-	-	2	3	-	-	-	-	2		
CO3	-	-	-	-	-	2	3	-	-	-	-	2		
CO4	-	-	-	-	-	2	3	-	-	-	-	2		
CO5	-	-	_	_	-	2	3	-	-	-	-	2		

CSL201	DATA STRUCTURES LAR	L	Т	Р	CREDIT	Year of Introduction
	STRUCTURES LAD	0	0	3	2	2019

СО	Course outcome	Knowledge level
CO1	Write a time/space efficient program using arrays/linked lists/trees/graphs to provide necessary functionalities meeting a given set of user requirements .	K4
CO2	Write a time/space efficient program to sort a list of records based on a given key in the record .	К3
CO3	Examine a given Data Structure to determine its space complexity and time complexities of operations on it .	К3
CO4	Design and implement an efficient data structure to represent given data .	K3
CO5	Write a time/space efficient program to convert an arithmetic expression from one notation to another.	К3
CO6	Write a program using linked lists to simulate Memory Allocation and Garbage Collection.	К3

РО						Progra	mme o	utcome	es					PSO
со	РО 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CSL201.CO1	3	3	3	2	-	1	-	2	-	2	-	3	3	-
CSL201.CO2	3	3	3	2	-	-	-	2	-	2	-	3	3	-
CSL201.CO3	3	3	3	2	-	-	-	2	-	2	-	3	3	-
CSL201.CO4	3	3	3	2	-	-	-	2	-	2	-	3	3	-
CSL201.CO5	3	3	3	-	-	-	-	2	-	2	-	3	3	-
CSL201.CO6	3	3	3	-	-	-	-	2	-	2	-	3	3	-
AVG	3	3	3	2	-	1	-	2	-	2	-	3	3	-

CSL 202	OBJECT	L	Т	Р	CREDIT	Year of Introduction
CSL 203	ORIENTED PROGRAMMING LAB(IN JAVA)	0	0	3	2	2019

CO	Course outcome	Knowledge
	Course outcome	level
CO1	Implement the Object Oriented concepts - constructors, inheritance, method overloading & overriding and polymorphism in Java	К3
CO2	Implement programs in Java which use datatypes, operators, control statements, built in packages & interfaces, Input/Output streams and Files	К3
CO3	Implement robust application programs in Java using exception handling	K3
CO4	Implement application programs in Java using multithreading and database connectivity	К3
CO5	Implement Graphical User Interface based application programs by utilizing event handling features and Swing in Java	К3

РО						F	Program	nme ou	itcome	s			PSO		
со	PO1	L PO2 PO PO PO PO PO PO PO PO PO1 PO1 PO1 3 4 5 6 7 8 9 0 1								PO12	PSO 1	PSO 2			
CO1	3	3	3	3	3	-	-	1	-	3	-	3	1	-	
CO2	3	3	3	3	3	-	-	1	-	3	-	3	-	-	
CO3	3	3	3	3	3	-	-	1	-	3	-	3	-	-	
CO4	3	3	3	3	3	-	-	1	-	3	-	3	3	1	
CO5	3	3	3	3	3	-	-	1	-	3	-	3	2	1	
AVG	3	3	3	3	3	-	-	1	-	3	-	3			

MAT	PROBABILITY AND STATISTICAL	L	Т	Р	CREDI T	Year of Introduction
256	MODELLING	3	1	0	4	2019

Prerequisite: Nil

Course Outcomes: After completion of the course the student will be able to:

CO 1	Explain the concept, properties and important models of discrete random variables and use them to analyze suitable random phenomen
CO 2	Summarize the properties and relevant models of continuous random variables and use them to analyze suitable random phenomena
CO 3	Make use of concepts of sampling and theory of estimation to solve application level problems.
CO 4	Organize the basic concepts in hypothesis testing and develop decision procedures for the most frequently encountered testing problems.
CO 5	Build statistical methods like correlation and regression analysis to interpret experimental data.

Mapping of course outcomes with program outcomes (Minimum requirement):

	PO	PO	PO	PO	PO	PO	PO	PO	PO	РО	PO	РО	PSO	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO 1	3	2	2	2	-	-	-	-	-	-	-	1	2		
CO 2	3	2	2	2	-	-	-	-	-	-	-	1	2		
CO 3	3	3	2	2	-	-	-	-	-	-	-	1	3		
CO 4	3	3	2	2	-	-	-	-	-	-	-	1	3		
CO 5	3	3	2	2	-	-	-	-	-	-	-	1	3		
AVER AGE	3	2.6	2	2	-					-		1	2.6		
3: HI	GH	•	2: MF	DIUM	•	1:	LOW						•	•	

4

CST 202	COMPUTER ORGANISATION AND	L	Т	Р	CREDIT	Year of Introduction
	ARCHITECTURE	3	1	0	4	2019

Prerequisite: Topics covered under the course Logic System Design (CST 203)

Course Outcomes: After completion of the course the student will be able to:

CO	Statement	K LEVEL
CO1	Recognize and express the relevance of basic components,I/O organization and pipelining schemes in a digital computer(Cognitive Knowledge Level:Understand)	K2
CO2	Explain the types of memory systems and mapping functions used in memory systems.(Cognitive Knowledge Level:Understand)	K2
CO3	Demonstrate the control signals require for the execution of a given instruction. (Cognitive Knowledge Level:Apply)	K3
CO4	Illustrate the design of a Arithmetic Logic Unitand explain the usage of registers in it.(Cognitive Knowledge Level:Apply)	K3
CO5	Explain the implementaion aspects of a arithmetic algorithms in a digital computer.(Cognitive Knowledge Level:Apply)	K3
CO6	Develop the control logic for a given arithmetic problem.(Cognitive Knowledge Level:Apply)	К3

CO-PO-PSO MAPPING

СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO11	PO1 2	PSO1	PSO2
CO1	3	2	2	2	-	-	-	-	-	-	-	3	2	1
CO2	3	3	2	1	-	-	-	-	-	1	-	3	3	2
CO3	3	3	3	1	-	-	-	-	-	1	-	3	3	1
CO4	3	3	3	1	-	-	-	-	-	1	-	3	3	1
CO5	3	3	3	-	-	-	-	-	-	1	-	3	3	1
CO6	3	2	2	1	-	-	-	-	-	1	-	3	3	2
Average	3	3	3	1	-	-	-	-	-	1	-	3	-	-

CST 204	DTABASE MANAGEMENT	L	Т	Р	CREDIT	Year of Introduction
	SYSTEMS	3	1	0	4	2019

Prerequisite: Topics covered under the course Data Structures (CST 201), Exposure to a High Level Language like C/python.

Course Outcomes: After completion of the course the student will be able to:

СО	Course outcome	Knowledge level
CO1	Summarize and exemplify fundamental nature and characteristics of database systems (Cognitive Knowledge Level: Understand)	К2
CO2	Model real word scenarios given as informal descriptions, using Entity Relationship diagrams. (Cognitive Knowledge Level: Apply)	К3
CO3	Model and design solutions for efficiently representing and querying data using relational model (Cognitive Knowledge Level: Analyze)	K4
CO4	Demonstrate the features of indexing and hashing in database applications (Cognitive Knowledge Level: Apply)	К3
CO5	Discuss and compare the aspects of Concurrency Control and Recovery in Database systems (Cognitive Knowledge Level: Apply)	К3
CO6	Explain various types of NoSQL databases (Cognitive Knowledge Level: Understand)	К2

CO - PO - PSO MAPPING

со	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	1	1	1	-	-	-	-	-	-	-	-	1	1	-
CO2	2	3	3	2	-	-	-	-	-	-	-	3	3	1
CO3	2	3	3	2	-	-	-	-	-	-	-	3	3	-
CO4	2	3	3	-	-	-	-	-	-	1	-	3	1	-
CO5	2	3	3	-	-	-	-	-	-	1	-	3	2	-
CO6	1	1	1	-	2	-	-	-	-	1	-	3	1	-

CST 206	OPERATING SYSTEMS	L	Т	Р	CREDIT	Year of Introduction
		3	1	0	4	2019

Prerequisite: Topics covered in the courses are Data Structures (CST 201) and Programming in C (EST 102)

Course Outcomes: After completion of the course the student will be able to:

СО	Course outcome	Knowledge level
CO1	Explain the relevance, structure and functions of Operating Systems in computing devices.	K2
CO2	Illustrate the concepts of process management and process scheduling mechanisms employed in Operating Systems.	K2
CO3	Explain process synchronization in Operating Systems and illustrate process synchronization mechanisms using Mutex Locks, Semaphores and Monitors	K2
CO4	Explain any one method for detection, prevention, avoidance and recovery for managing deadlocks in Operating Systems.	K2
CO5	Explain the memory management algorithms in Operating Systems.	K2
CO6	Explain the security aspects and algorithms for file and storage management in Operating Systems.	K2

CO - PO - PSO MAPPING

РО		Programme outcomes													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO															
CO1	2	2	1	-	-	-	-	-	-	1	-	2	-	-	
CO2	2	2	1	-	-	-	-	-	-	1	-	2	-	-	
CO3	2	2	2	-	-	-	-	-	-	1	-	1	2	-	
CO4	2	2	1	-	-	-	-	-	-	1	-	2	1	1	
CO5	2	2	2	-	-	-	-	-	-	1	-	1	1	1	
CO6	2	1	1	-	-	-	-	-	-	1	-	2	-	-	
AVG	2	1.83	1.33		-	-	-	-	-	1	-	1.66	0.83	0.17	

Correlation : 1-Low, 2-Medium, 3-High, No Correlation '-'

EST 200	DESIGN AND ENGINEERING	L	Т	Р	CREDIT	Year of Introduction
		2	0	0	2	2019

Prerequisite: Nil

Course Outcomes: After completion of the course the student will be able to:

EST200.1	Explain the different concepts and principles involved in design engineering.											
EST200.2	Apply design thinking while learning and practicing engineering.											
EST200.3	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.											

CO - PO - PSO MAPPING

CO	PO 1	РО 2	РО 3	РО 4	PO 5	P O 6	РО 7	РО 8	PO 9	PO 10	РО 11	PO 12	PSO 1	PSO 2
EST200. 1	2	1	-	-	-	-	1	-	-	1	-	-	3	2
EST200. 2	-	2	-	-	-	1	-	1	-	-	-	2	3	2
EST200. 3	-	-	2	-	-	1	1	-	2	2	-	1	3	2
AVG.	2	1.5	2	-	-	1	1	1	2	1.5		1.5	2.67	2

1-Low; 2-Medium; 3-High

	CONSTITUTION	L	Т	Р	CREDIT	Year of Introduction
MCN202	OF INDIA	2	0	0	-	2019

Prerequisite: Nil

Course Outcomes: After completion of the course the student will be able to:

СО	Course outcome	Knowledge level
CO1	Explain the background of the present constitution of India and features.	К2
CO2	Utilize the fundamental rights and duties.	К3
CO3	Understand the working of the union executive, parliament and judiciary.	K2
CO4	Understand the working of the state executive, legislature and judiciary	K2
CO5	Utilize the special provisions and statutory institutions	К3
CO6	Show national and patriotic spirit as responsible citizens of the country.	К3

CO - PO - PSO MAPPING

PO		Programme outcomes												
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO1	PSO2
CO1	-	-	-	-	-	2	2	2	-	2	-	-	-	-
CO2	-	-	-	-	-	3	3	3	-	3	-	-	-	-
CO3	-	-	-	-	-	3	2	3	-	3	-	-	-	-
CO4	-	-	-	-	-	3	2	3	-	3	-	-	-	-
CO5	-	-	-	-	-	3	2	3	-	3	-	-	-	-
CO6	-	-	-	-	-	3	3	3	-	2	-	-	-	-
AV G	-	-	-	-	-	2.8 3	2.3 3	2.8 3	-	2.66	-	-	-	-

Correlation : 1-Low, 2-Medium, 3-High, No Correlation '-'

CSL204	OPERATING	L	Т	Р	CREDIT	Year of Introduction
	SYSTEMS LAB	0	0	3	2	2019

Course Outcomes: After completion of the course the student will be able to:

со	Course outcome	Knowledge level
CO1	Illustrate the use of systems calls in Operating Systems. (Cognitive knowledge: Understand)	K2
CO2	Implement Process Creation and Inter Process Communication in Operating Systems. (Cognitive knowledge: Apply)	К3
CO3	Implement Fist Come First Served, Shortest Job First, Round Robin and Priority based CPU Scheduling Algorithms. (Cognitive knowledge: Apply)	К3
CO4	Illustrate the performance of First in First Out, Least Recently Used and Least Frequently Used Page Replacement Algorithms. (Cognitive knowledge: Apply)	К3
CO5	Implement modules for Deadlock Detection and Deadlock Avoidance in Operating Systems. (Cognitive knowledge: Apply)	К3
CO6	Implement modules for Storage Management and Disk Scheduling in Operating Systems. (Cognitive knowledge: Apply)	К3

<u>CO - PO - PSO MAPPING</u>

PO		Programme outcomes													
СО	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO1	PSO 2	
CO1	2	2	2	-	-	-	-	1	-	1	-	3	-	-	
CO2	3	3	3	-	-	-	-	1	-	1	-	3	-	-	
CO3	3	3	3	2	-	-	-	1	-	1	-	3	1	-	
CO4	3	3	3	2	-	-	-	1	-	1	-	3	1	-	
CO5	3	3	3	2	-	-	-	1	-	1	-	3	1	-	
CO6	3	3	3	2	-	-	-	1	-	1	-	3	-	-	
AVG	2.83	2.83	2.83	2	-	-	-	1	-	1	-	3	0.5	-	

Correlation : 1-Low, 2-medium, 3-high, No Correlation '-'

ADL 202	PYTHON AND	L	Т	Р	CREDIT	Year of Introduction
	STATISTICAL MODELLING	0	0	3	2	2019

Course Outcomes: After completion of the course the student will be able to:

CO.1	Experiment with concepts of iteration, function, string and list (Cognitive Knowledge Level: Apply)
CO.2	Identify the importance of tuples, dictionary traversal, dictionary methods, files and operations (Cognitive Knowledge Level: Apply)
CO.3	Model graphical representation of data, measures of central tendency and measures of dispersion (Cognitive Knowledge Level: Apply)
CO.4	Solve problems based on Binomial distribution, Poisson distribution, sampling and regression analysis (Cognitive Knowledge Level: Apply)
CO.5	Make use of various correlation tests and utilize statistical analysis software (Cognitive Knowledge Level: Apply)

<u>CO - PO - PSO MAPPING</u>

	PO1 (K3)	PO2 (K4)	PO3 (K5)	PO4 (K5)	PO5 (K6)	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1 (K3)	PSO2 (K3)
CO1	3	3	3					1				1	2	
CO2	3	3	3	2				1				1	2	
CO3	3	3	3	2				1				1	2	
CO4	3	3	3	2				1				1	2	
CO5	3	3	3	2	2			1				1	2	1

5

ADT 301	FOUNDATIONS OF	L	Т	Р	CREDIT	Year of Introduction
301	DATA SCIENCE	3	1	0	4	2022

Prerequisite: Basic understanding of probability theory, linear algebra and basic programming knowledge. **Course Outcomes:** After completion of the course the student will be able to:

CO 1	Recall the fundamental concepts and applications of data	K2
	science, and make inferences on key important points.	
CO2	Identify the concepts in data mining and analyze the different steps in data preprocessing.	K2
CO3	Illustrate the concepts of classification methods.	К3
CO4	Perform association mining and analyze clusters using different methods.	К3
CO5	Evaluate & improve the performance of machine learning classification models.	К2

	PO	РО	PO	РО	PO	PO	PO	PO	РО	PO	PO	РО	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	3	-	-	3	-	-	-	-	-	-	2	2	-
CO2	3	2	1	3	2	-	-	-	-	-	-	3	2	3
CO3	3	2	2	2	2	-	-	-	-	-	-	3	3	3
CO4	3	2	1	2	2	-	-	-	-	-	-	2	3	2
C05	3	2	3	2	-	-	-	-	-	_	-	3	3	-

CST 303	COMPUTER	L	Т	Р	CREDIT	Year of Introduction
505	NE I WORKS	3	1	0	4	2022

Prerequisite: Nil

Course Outcomes: After completion of the course the student will be able to:

CO 1	Explain the features of computer networks, protocols, and network design models .	K2
CO2	Describe the fundamental characteristics of the physical layer and identify the usage in network communication.	K3
CO3	Explain the design issues of data link layer, link layer protocols, bridges and switches.	K2
CO4	Illustrate wired LAN protocols (IEEE 802.3) and wireless LAN protocols (IEEE 802.11).	К2
CO5	Select appropriate routing algorithms, congestion control techniques, and Quality of Service requirements for a network.	К3
CO6	Illustrate the functions and protocols of the network layer, transport layer, and application layer in inter-networking.	K2

	РО	PO	PO	РО	PO	PSO	PSO							
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	-	-	-	-	-	I	-	-	-	3	3	1
CO2	3	3	2	-	-	-	-	I	-	-	-	3	3	1
CO3	3	2	1	-	-	-	-	I	-	-	-	3	3	1
CO4	3	2	1	-	-	-	-	I	-	-	-	2	3	1
C05	3	2	1	1	-	-	_	_	-	-	-	3	3	1
C06	3	2	1	-	-	-	2					3	3	1

AMT 305	INTRODUCTION TO MACHINE	L	Т	Р	CREDIT	Year of Introduction
505	LEARNING	3	1	0	4	2020

Prerequisite: Basic understanding of probability theory and linear algebra.

Course Outcomes: After completion of the course the student will be able to:

CO 1	Illustrate Machine Learning concepts and basics of supervised learning concepts.	К3
CO2	Describe dimensionality reduction techniques and supervised learning concepts(regression, linear classification).	К3
CO3	Solve real life problems using appropriate machine learning models and evaluate the performance measures and Illustrate the concepts of Multilayer neural network.	К3
CO4	Illustrate basics of parameter estimation models and the working of classifier SVM classifier model.	К3
CO5	Describe unsupervised learning concepts.	K3

	РО	PO	PO	РО	PO	PSO	PSO							
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	1	-	-	-	-	-	-	-	3	2	1
CO2	3	3	3	2	2	-	-	-	-	-	-	3	2	2
CO3	3	3	3	2	-	I	-	-	-	-	-	3	3	3
CO4	3	3	3	1	-	-	-	-	-	-	-	3	3	2
C05	3	3	3	1	-	-	-	-	-	-	-	3	3	2

AIT	INTRODUCTION	L	Т	Р	CREDIT	Year of Introduction
507	INTELLIGENCE	3	1	0	4	2020

Prerequisite: Nil

Course Outcomes: After completion of the course the student will be able to:

CO 1	Explain the fundamental concepts of intelligent systems and	K2
	their architecture.	
CO2	Illustrate uninformed and informed search techniques for problem solving in intelligent systems.	K2
CO3	Solve Constraint Satisfaction Problems using search techniques.	К3
CO4	Represent AI domain knowledge using logic systems and use inference techniques for reasoning in intelligent systems.	К3
CO5	Illustrate different types of learning techniques used in intelligent systems	K2

	РО	PO	PO	РО	PO	PO	PO	PO	РО	PO	PO	PO	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	-	-	-	-	-	-	-	-	-	-	-	2	3
CO2	2	2	-	-	-	-	-	-	-	-	-	3	2	3
CO3	2	2	1	2	-	-	-	-	-	-	-	2	3	-
CO4	1	3	1	2	-	-	-	-	-	-	-	1	3	-
C05	2	2	-	-	-	-	-	-	-	-	-	1	3	3

CST 300	MANAGEMENT OF	L	Т	Р	CREDIT	Year of Introduction
509	SYSTEMS	3	0	0	3	2019

Prerequisite: Basic understanding of Object Oriented Design and Development.

Course Outcomes: After completion of the course the student will be able to:

CO 1	Demonstrate Traditional and Agile Software Development	К3
	approaches.	
CO2	Prepare Software Requirement Specification and Software Design for a given problem.	К3
СО3	Justify the significance of design patterns and licensing terms in software development, prepare testing, maintenance and DevOps strategies for a project	К3
CO4	Make use of software project management concepts while planning, estimation, scheduling, tracking and change management of a project, with a traditional/agile framework.	К3
C05	Utilize SQA practices, Process Improvement techniques and Technology advancements in cloud based software models and containers & microservices	К3

	РО	PO	PO	РО	PO	PSO	PSO							
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	3	-	2	-	-	-	-	-	3	3	-
CO2	3	3	3	2	-	2	-	-	-	2	3	2	3	-
CO3	3	3	2	2	-	-	-	2	-	3	3	2	3	-
CO4	3	3	3	2	-	2	-	-	2	3	2	3	3	-
CO5	3	3	3	3	-	3	-	-	-	-	-	3	3	-

ADL 331	AI & DATA	L	Т	Р	CREDIT	Year of Introduction
	SCIENCE LAB	0	0	3	2	2020

Prerequisite: Fundamentals of programming, python programming fundamentals, Machine learning.

Course Outcomes: After completion of the course the student will be able to:

CO 1	Implement various predictive and descriptive analysis	К3
	measures using Python. Use various packages and libraries in	
	Python for data handling.	
CO2	Implement different Regression methods such as Linear and Logistic regression to interpret the given dataset	К3
CO3	Implement various supervised learning models like k-Nearest Neighbour, Support Vector Machine, Naïve Bayesian Classifier and Decision Tree algorithms.	К3
CO4	Implement mathematical optimization method like the Hill Climbing algorithm and Deep Learning method like Convolutional Neural Network algorithm.	К3
CO5	Implement different methods (like Correlation and Covariance) to determine the dependence between features in the dataset and apply dimensionality reduction techniques.	К3

	PO	РО	PO	PO	РО	PSO	PSO							
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	2	3	3	-	-	-	2	-	-	-	2	-	-
CO2	2	2	3	2	-	-	-	2	-	-	-	3	3	2
CO3	2	2	1	2	-	3	-	3	-	-	-	2	3	3
CO4	1	3	1	2	-	2	-	3	-	-	-	1	3	3
C05	2	2	2	1	-	3	-	2	-	-	-	1	-	-

CSL 333	DATABASE MANAGEMENT	L	Т	Р	CREDIT	Year of Introduction
555	SYSTEMS LAB	0	0	4	2	2019

Prerequisite: A sound knowledge of the basics of relational DBMS.

Course Outcomes: After completion of the course the student will be able to:

CO 1	Design database schema for a given real world	К3
	problem-domain using standard design and modeling	
	approaches.	
CO2	Construct queries using SQL for database creation, interaction, modification, and updation.	К3
CO3	Design and implement triggers and cursors.	К3
CO4	Implement procedures, functions, and control structures using PL/SQL.	К3
CO5	Perform CRUD operations in NoSQL Databases.	К3
CO6	Develop database applications using front-end tools and back-end DBMS.	К6

	РО	РО	PO	РО	PO	PO	PO	PO	РО	PO	PO	PO	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3		3			2		2		2	2	1
CO2	3	2	3		3			2		2		2	2	2
CO3	3	2	2	2	2			2		2		2	-	-
CO4	3	2	2	2	2			2		2		2	-	-
CO5	3	2	2		2			2		2		2	3	1
CO6	3	2	2	2	2	2		2	2	2	2	2	3	2

MCN 301	DISASTER	L	Т	Р	CREDIT	Year of Introduction
501	MANAGEMENI	2	0	0	Nil	2019

Prerequisite: Nil

Course Outcomes: After completion of the course the student will be able to:

CO 1	Define and use various terminologies in use in disaster management parlance and organise each of these terms in	K2
	relation to the disaster management cycle	
CO2	Distinguish between different hazard types and vulnerability types and do vulnerability assessment	К2
CO3	Identify the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk.	К2
CO4	Explain the core elements and phases of Disaster Risk Management and develop possible measures to reduce disaster risks across sector and community.	К3
CO5	Identify factors that determine the nature of disaster response and discuss the various disaster response actions	К2
CO6	Explain the various legislations and best practices for disaster management and risk reduction at national and international level.	К2

	PO	РО	PO	PO	PO	PSO	PSO							
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	2	-	-	-	2	-	-	-	2	-	2	-	-
CO2	2	3	2	-	2	2	3	-	-	3	-	2	-	-
CO3	2	3	2	2	2	2	3	-	-	3	-	2	-	-
CO4	3	3	3	-	2	2	3	-	-	-	-	2	-	-
CO5	3	3	-	-	2	2	3	-	-	-	-	2	-	1
CO6	3	-	-	-	_	2	3	3	-	-	-	2	-	2

6				-		
CST	ALGORITHM	L	Т	Р	CREDI T	YEAR OF INTRODUCTION
306	ANALYSIS & DESIGN	3	1	0	4	2019

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Prerequisite: Strong Foundation in Mathematics, Programming in C, Data Structures and Graph Theory. **Course Outcomes:** After completion of the course the student will be able to:

CO 1	Analyze any given algorithm and express its time and space complexities in asymptotic notations.
CO 2	Derive recurrence equations and solve it using Iteration, Recurrence Tree, Substitution and Master's Method to compute time complexity of algorithms.
CO 3	Illustrate Graph traversal algorithms & applications and Advanced Data structures like AVL trees and Disjoint set operations.
CO 4	Demonstrate Divide-and-conquer, Greedy Strategy, Dynamic programming, Branch-and Bound and Backtracking algorithm design techniques.
CO 5	Classify a problem as computationally tractable or intractable, and discuss strategies to address intractability.
CO 6	Identify the suitable design strategy to solve a given problem.

	P	РО	PO	PO	PO	PO	PO	PO	РО	PO	PO	PO	PSO	PSO	PSO
	0 1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO 1	2	3	2	2	-	-	-	-	-	-	-	2	2	-	2
CO 2	2	3	2	2	-	-	-	-	-	-	-	1	2	-	2
CO 3	1	2	2	2	-	-	-	-	-	-	-	2	2	-	1
CO 4	2	3	3	2	-	-	-	-	-	-	-	3	2	-	2
CO 5	1	2	-	-	-	-	-	-	-	-	-	1	-	-	1
CO 6	2	2	3	3	_	-	-	-	-	-	-	3	2	-	2
AVER AGE	1.67	2.50	2.40	2.20	-	-	-	-	-	-	-	2.00	1.66	-	1.67

ADT302	CONCEPTS IN BIG	L	Т	Р	CREDIT	YEAR OF INTRODUCTION
	DATA ANALY TICS	3	1	0	4	2020

Prerequisite: Basic knowledge in programming **Course Outcomes:** After completion of the course the student will be able to:

СО	Statement	K LEVEL
CO1	Outline the basic big data concept. (Cognitive Knowledge Level: Understand)	K2
CO2	Categorize and summarize the processing in Big Data and its importance. (Cognitive Knowledge Level: Understand	К2
CO3	Simulate various big data technologies like Hadoop MapReduce, Pig, Hive, HBase. (Cognitive Knowledge Level: Apply)	К3
CO4	Determine tools and techniques to analyze Big Data (Cognitive Knowledge Level: Apply)	К3
CO5	Resolve problems associated with big data with the features of R programming (Cognitive Knowledge Level: Apply)	К3

CO-PO-PSO MAPPING

СО	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	2	3	-	-	-	-	-	-	-	-	-	2	2	1
CO2	3	2	1	-	-	-	-	-	-	-	-	3	3	2
CO3	3	2	2	2	-	-	-	-	-	-	-	3	3	1
CO4	3	2	3	2	-	-	-	-	-	-	-	2	3	2
CO5	3	2	3	2	2	-	-	-	-	-	-	3	3	1
Averag e	2	3	-	-	-	-	-	-	-	-	-	2	2	1

HUT 300	INDUSTRIAL ECONOMICS	L	Т	Р	CREDIT	YEAR OF INTRODUCTION
	& FOREIGN TRADE	3	0	0	3	2019

Prerequisite: Nil

Course Outcomes: After completion of the course the student will be able to:

СО	Course outcome
CO1	Explain the problem of scarcity of resources and consumer behaviour, and to evaluate
001	the impact of government policies on the general economic welfare.
CO2	Take appropriate decisions regarding volume of output and to evaluate the social cost
	of production
CO3	Determine the functional requirement of a firm under various competitive conditions
CO4	Examine the overall performance of the economy, and the regulation of economic
	fluctuations and its impact on various sections in the society
CO5	Determine the impact of changes in global economic policies on the business
	opportunities of a firm

<u>CO - PO - PSO MAPPING</u>

СО	Р О 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	2	-	-	-	-	-	-	-	-	-	3	-	1	-
CO2	2	2	-	-	2	2	3	-	-	-	3	-	1	-
CO3	2	2	1	-	-	-	-	-	-	-	3	-	1	-
CO4	2	2	1	-	-	1	-	-	-	-	3	-	1	-
CO5	2	2	1	-		-	-	-	-	-	3	-	1	-
Average	2	2	1	-	2					-	3	-	1	-

ADT 308	Comprehensive Course work	L	Т	Р	CREDIT	Year of Introduction
		1	0	0	1	2019

Prerequisite:

- 1. Introduction to Machine Learning
- 2. Data Structures
- **3. Operating Systems**
- 4. Database Management Systems5. Foundation of Data Science

Course Outcomes: After completion of the course the student will be able to:

СО	Course outcome	Knowledge level
CO1	Comprehend the concepts in machine learning (Cognitive Knowledge Level: Understand)	K2
CO2	Comprehend the concepts and applications of data structures (Cognitive Knowledge Level: Understand)	К2
CO3	Comprehend the concepts, functions and algorithms in Operating System (Cognitive Knowledge Level: Understand))	K2
CO4	Comprehend the fundamental principles of database design and manipulation (Cognitive Knowledge Level: understand)	K2
CO5	Comprehend the basic concepts of data science (Cognitive Knowledge Level: Understand)	K2

CO - PO - PSO MAPPING

РО	Programme outcomes													
СО	PO 1	PO 2	PO3	PO4	PO 5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	3	-	-	-	-	-	-	-	-	-	3	3	2
CO2	3	3	-	-	-	-	-	-	-	-	-	3	3	2
CO3	3	3	-	-	-	-	-	-	-	-	-	3	3	2
CO4	3	3	-	-	-	-	-	-	-	-	-	3	3	2
CO5	3	3	-	-	-	-	-	-	-	-	-	3	3	2
AVG	3	3	-	-	-	-	-	-	-	-	-	3	3	2

A 1772 (2	PROGRAMMING	L	Т	Р	CREDIT	Year of Introduction
AI I 362		2	1	0	3	2019

Prerequisite: Fundamental concepts in programming in C and Probability and Statistical Modeling

Course Outcomes: After completion of the course the student will be able to:

No.	Course outcomes	Know ledge Level
CO1	Illustrate uses of conditional and iterative statements in R programs.	K3
CO2	Write, test and debug R programs.	K3
CO3	Illustrate the use of Probability distributions and basic statistical functions.	К3
CO4	Visualize different types of data.	K3
CO5	Comprehend regression modeling using R.	K2

CO - PO - PSO MAPPING

	PO	PO	PO	РО	PO	РО	РО	РО	PO	PO1	PO1	PO1	PSO	PSO
	1	2	3	4	5	6	7	8	9	0	1	2	1	2
C01	3	3	2	-	3	-	-	-	-	-	-	3	3	2
CO2	3	3	1	-	3	-	-	-	-	-	-	3	3	2
CO3	3	3	2	3	3	-	-	-	-	-	-	3	3	-
CO4	3	3	2	3	3	-	-	-	-	-	-	3	3	-
C05	3	3	-	-	2	-	-	-	-	-	-	3	2	-

1-Low; 2-Medium; 3-High

AIT	ROBOTICS AND	L	Т	Р	CREDI T	YEAR OF INTRODUCTION
304	INTELLIGENT SYSTEMS	3	1	0	4	2022

Prerequisite: Basic understanding of probability theory, linear algebra, machine learning, artificial intelligence

Course Outcomes: After completion of the course the student will be able to:

СО	Course outcome	Knowledge level
CO1	Understand the concepts of manipulator and mobile robotics. (Cognitive Knowledge Level: Understand)	K2
CO2	Choose the suitable sensors, actuators and control for robot design. (Cognitive Knowledge Level: Apply)	К3
CO3	Developing kinematic model of mobile robot and understand robotic vision intelligence. (Cognitive Knowledge Level: Apply)	К3
CO4	Discover the localization and mapping methods in robotics. (Cognitive Knowledge Level: Apply)	К3
CO5	Plan the path and navigation of robot by applying artificial intelligence algorithm. (Cognitive Knowledge Level: Apply)	K3

<u>CO - PO - PSO MAPPING</u>

РО		Programme outcomes												
со	PO 1	PO 2	PO3	PO4	PO 5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO 1	3	-	-	-	1	2	-	-	-	-	-	3	1	-
CO 2	2	1	-	-	1	-	-	-	-	-	-	1	1	-
CO 3	1	1	-	1	2	2	-	-	-	-	-	1	-	-
CO 4	2	-	-	1	2	1	-	-	-	-	-	1	3	-
CO 5	3	-	-	2	1	1	-	-	-	-	-	2	3	3
AV G	2.2	0.4	-	1	1.4	1.2	-	-	-	-	-	1.61	1.6	0.6

ADL3	BIG DATA ANALYTICS	L	Т	Р	CREDI T	Year of Introduction
32	LAB	0	0	3	3	2019

Course Outcomes: After completion of the course the student will be able to:

No.	Course outcomes	Knowledg e Level
CO1	Illustrate the setting up of and Installing Hadoop in one of the three operating modes.	K2
CO2	Implement the file management tasks in Hadoop and explore the shell commands.	К3
CO3	Implement different tasks using Hadoop Map Reduce programming model.	К3
CO4	Implement Pig Scripting operations and Spark Application functionalities.	К3
CO5	Implement data extraction from files and other sources and perform various data manipulation tasks on them using R Program.	К3
CO6	Illustrate the knowledge of R gained to data analytics for real life applications.	K2

	PO	PO1	PO1	PO1	PSO	PSO								
	1	2	3	4	5	6	7	8	9	0	1	2	1	2
CO1	3	1	-	-	2	-	-	2	-	2	-	2	2	-
CO2	3	3	3	-	3	-	-	3	-	3	-	3	3	-
CO3	3	3	2	-	3	-	-	2	-	3	-	2	2	-
CO4	3	3	2	-	3	-	-	3	-	3	-	2	2	-
CO5	3	3	2	-	3	-	-	3	-	3	-	2	2	-
CO6	3	3	2	-	3	-	-	3	-	2		3	-	-

<u>CO - PO - PSO MAPPING</u>

ADD334		L	Т	Р	CREDIT	YEAR OF INTRODUCTION
ADD004	MINI PROJECT	0	0	3	2	2022

Course Outcomes: After completion of the course the student will be able to:

No.	Course outcomes	Knowledg e Level
CO1	Identify technically and economically feasible problems of social relevance (Cognitive Knowledge Level: Apply)	K3
CO2	Identify and survey the relevant literature for getting exposed to related solutions (Cognitive Knowledge Level: Apply)	K3
CO3	Perform requirement analysis and identify design methodologies and develop adaptable and reusable solutions of minimal complexity by using modern tools and advanced programming techniques (Cognitive Knowledge Level: Apply)	К3
CO4	Prepare technical report and deliver presentation(Cognitive Knowledge Level: Apply)	К3
CO5	Apply engineering and management principles to achieve the goal of the project (Cognitive Knowledge Level: Apply)	К3

<u>CO - PO - PSO MAPPING</u>

	PO	PO	PO	РО	PO	РО	PO	РО	PO	PO1	PO1	PO1	PSO	PSO
	1	2	3	4	5	6	7	8	9	0	1	2	1	2
CO1	3	2	2	2	-	2	1	2	1	1	1	2	3	1
CO2	3	2	2	2	1	2	-	1	1	1	1	2	3	1
CO3	3	2	2	3	2	2	1	1	1	1	1	2	3	1
CO4	1	1	1	1	1	-	-	1	1	1	1	1	3	1
CO5	2	2	1	2	1	2	2	1	1	-	1	2	3	1

COURSE OUTCOMES

СО	Course Outcome	Knowledge level
ADD 415.1	Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply).	КЗ
ADD 415.2	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).	КЗ
ADD 415.3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).	K3
ADD 415.4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).	К3
ADD 415.5	Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).	K3
ADD 415.6	Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply).	КЗ

CO-PO-PSO MAPPING

		Programme Outcomes												PSO	
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	2	2	2	1	2	2	2	1	1	1	1	2	1	1	
CO2	2	2	2		1	3	3	1	1		1	1			
CO3									3	2	2	1	1	1	
CO4					2			3	2	2	3	2	1	1	
CO5	2	3	3	1	2							1	1	1	
CO6					2			2	2	3	1	1			
AVG	2	2.33	2.33	1	1.8	2.5	2.5	1.75	1.8	2	1.6	1.33	1	1	

Programme: Bachelor of Technology Course Name: Seminar Course Code: ADQ 413 Semester: 7

COURSE OUTCOMES

СО	Course Outcome	Knowledge level
ADQ 413.1	Identify academic documents from the literature which are related to her/his areas of interest (Cognitive knowledge level: Apply).	К3
ADQ 413.2	Read and apprehend an academic document from the literature which is related to her/ his areas of interest (Cognitive knowledge level: Analyze).	К3
ADQ 413.3	Prepare a presentation about an academic document (Cognitive knowledge level: Create).	К3
ADQ 413.4	Give a presentation about an academic document (Cognitive knowledge level: Apply).	К3
ADQ 413.5	Prepare a technical report (Cognitive knowledge level: Create).	К3

CO-PO-PSO MAPPING

				PSO										
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	1	-	2	1	-	-	-		3	-	-
CO2	3	3	2	3	-	2	1	-	-	-		3	2	-
CO3	3	2	-	-	3	-	-	1	-	2		3	-	-
CO4	3	-	-	-	2	-	-	1	-	3		3	-	-
CO5	3	3	3	3	2	2	-	2	-	3		3	-	-
AVG	2.8	2.5	2	2.33	2.33	2	1	1.33		2.66		3	2	

Course Name: Concepts in Compiler Design

COURSE OUTCOMES

The students will be able to:

со	Course outcome	Knowledge level
AIT443.1	Student will be able to explain the phases in compilation process (lexical analysis, syntax analysis, semantic analysis, intermediate code generation, code optimization and code generation) and model a lexical analyser.	К3
AIT443.2	Students will be able to model language syntax using Context Free Grammar and construct Top-Down Parsers.	K3
AIT443.3	Students will be able to compare different types of parsers (Bottom-up and Top-down) and construct parser for a given grammar	K3
AIT443.4	Build Syntax Directed Translation for a context free grammar, compare various storage allocation strategies and classify intermediate representations	К3
AIT443.5	Illustrate code optimization and code generation techniques in compilation	К3

CO - PO - PSO MAPPING

РО	Programme outcomes													
со	PO1	01 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PSO1 PS												PSO2
CO1	3	3	1	1	1	-	-	-	-	-	-	1	-	-
CO2	3	3	1	1	1	-	-	-	-	-	-	1	1	-
CO3	3	3	1	1	1	-	-	-	-	-	-	1	1	-
CO4	3	3	1	1	-	-	-	-	-	-	-	1	-	-
CO5	3	3	1	1	-	-	-	-	-	-	-	1	-	-
AVG	3	3	1	1	0.6	-	-	-	-	-	-	1	0.4	-

Course Name: Concepts in Compiler Design

Semester: 7

COURSE OUTCOMES

The students will be able to:

со	Course outcome	Knowledg e level
AIT443.1	Student will be able to explain the phases in compilation process (lexical analysis, syntax analysis, semantic analysis, intermediate code generation, code optimization and code generation) and model a lexical analyser.	K3
AIT443.2	Students will be able to model language syntax using Context Free Grammar and construct Top-Down Parsers.	К3
AIT443.3	Students will be able to compare different types of parsers (Bottom-up and Top-down) and construct parser for a given grammar	K3
AIT443.4	Build Syntax Directed Translation for a context free grammar, compare various storage allocation strategies and classify intermediate representations	K3
AIT443.5	Illustrate code optimization and code generation techniques in compilation	K3

CO - PO - PSO MAPPING

РО	Programme outcomes													
со	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 PS02												PSO2	
CO1	3	3	1	1	1	-	-	-	-	-	-	1	-	-
CO2	3	3	1	1	1	-	-	-	-	-	-	1	1	-
CO3	3	3	1	1	1	-	-	-	-	-	-	1	1	-
CO4	3	3	1	1	-	-	-	-	-	-	-	1	-	-
CO5	3	3	1	1	-	-	-	-	-	-	-	1	-	-
AVG	3	3	1	1	0.6	-	-	-	-	-	-	1	0.4	-

Correlation: 1-Low, 2-Moderate, 3-High, No Correlation

Course Code: AIT 401

Course Name: Foundations of Deep Learning

Semester: 7

COURSE OUTCOMES

СО	Course outcome	Knowledge level
AIT401.1	Illustrate the basic concepts of neural networks, deep learning and its practical issues	К3
AIT401.2	Outline the standard regularization and optimization techniques for the effective training of deep neural networks.	К2
AIT401.3	Build convolutional Neural Network (CNN) models for different use cases.	К3
AIT401.4	Apply the concepts of Recurrent Neural Network (RNN), Long Short Term Memory(LSTM), Gated Recurrent Unit (GRU).	К3
AIT401.5	Explain the concepts of auto encoder, generative models	К3

CO - PO - PSO MAPPING

	Programme Outcomes													PSO		
СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
CO1	3	3	2	2								3	3	2		
CO2	3	2	2	3								3	3	3		
CO3	3	3	3	2	2							3	3	2		
CO4	3	3	2	1	2							3	2	3		
CO5	3	2	1	2								3	3	3		
AVG	3	2.6	2	2	0.8							3	2.8	2.6		

Programme: Bachelor of Technology Course Name: Deep Learning Lab Course Code: AIL 411 Semester: 7

COURSE OUTCOMES

СО	Course outcome	Knowledge level
AIL411.1	Implement advanced machine learning concepts using python.	K3
AIL411.2	Applybasic data pre-processing and tuning techniques.	К3
AIL411.3	Implement basic neural network and CNN on standard datasets.	К3
AIL411.4	Design and Implement sequence modelling schemes.	К3
AIL411.5	Implement auto encoders on standard datasets and analyse the performance.	К3

<u>CO - PO - PSO MAPPING</u>

			-	PSO										
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	1		-	2	-	1	-	2	-	
CO2	3	3	3	2	3		-	3	-	2	-	2	-	
CO3	2	3	1	3	2	2	-	1	-	2	-	2	_	
CO4	3	3	2	1	3	2	-	3	-	1	-	2	-	
CO5	2	3	3	2	2	3	-	2	-	3	-	2	-	
AVG	2.6	2.8	2.2	2	2.4	1.4	-	2.2	-	1.8	-	2	-	

Course Name: Computational Health Informatics

Course Code: AIT 497

Semester: 7

COURSE OUTCOMES

СО		Course outcome	Knowledge
			level
AIT497.1		Describe health informatics, including its principles, concepts, and applications of computational methods and techniques used in health informatics	К2
	AIT497.2	Illustrate latest trends, advancements, and emerging technologies in computational health informatics	К3
	AIT497.3	Demonstrate application of computational methods and techniques to analyze and manipulate medical images for various purposes, such as diagnosis, treatment planning, and research	К3
	AIT497.4	Use the machine learning techniques to health images to aid in various aspects of healthcare, including diagnosis, treatment planning, and disease monitoring	К3
	AIT497.5	Implement deep learning techniques to analyze and interpret medical images	K3

<u>CO - PO - PSO MAPPING</u>

			PSO											
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	3	3	-	-	-	-	-	-	-	-	3
CO2	3	2	3	2	3	-	-	-	-	-	-	-	-	3
CO3	2	1	3	2	3	-	-	-	-	-	-	-	-	2
CO4	3	1	3	3	-	-	-	-	-	-	-	-	-	3
CO5	3	2	-	-	3	-	-	-	-	-	-	-	-	3
AVG	2.8	1.6	3	2.5	3	-	-	-	-	-	-	-	-	2.8

Course Name: Industrial Safety Engineering

COURSE OUTCOMES

CO	Course outcome	Knowledg					
MCN401.1	Describe the theories of accident causation and preventive measures of industrial accidents	K2					
MCN401.2	Explain about personal protective equipment, its selection, safety performance & indicators and importance of housekeeping.	K2					
MCN401.3	Explain different issues in construction industries.	K2					
MCN401.4	Describe various hazards associated with different machines and mechanical material handling.	K2					
MCN401.5	Utilize different hazard identification tools in different industries with the knowledge of different types of chemical hazards.	К3					

<u>CO - PO - PSO MAPPING</u>

	Programme Outcomes													PSO	
СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	2	2	-	-	-	2	2	2	-	-	-	1	-	-	
CO2	2	1	2	-	1	1	1	1	-	-	-	1	-	-	
CO3	2	2	2	-	1	1	1	1	1	1	-	1	-	-	
CO4	2	2	2	-	1	1	1	1	1	1	-	1	-	-	
CO5	2	2	2	1	1	1	1	1	1	1	-	1	-	-	
AVG	2	1.8	1.6	0.2	0.8	1.2	1.2	1.2	0.6	0.6	-	1	-	-	

Course Name: Miniproject

Course Code: CSD481 Semester: 7

COURSE OUTCOMES

CO	Course outcome	Knowledge
		level
CSD481.1	Identify technically and economically feasible problems	K3
CSD481.2	Identify and survey the relevant literature for getting exposed to related solutions	К3
CSD481.3	Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions of minimal complexity by using modern tools & advanced programming techniques	К3
CSD481.4	Prepare technical report and deliver presentation	K3
CSD481.5	Apply engineering and management principles to achieve the goal of the project	К3

CO - PO - PSO MAPPING

				PSO										
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	-	1	1	2	2	1	2	1	-	-
CO2	3	3	3	2	2	2	-	1	2	1	1	2	-	-
CO3	3	3	3	2	2	1	3	2	2	1	1	1	-	-
CO4	3	2	2	2	1	-	-	2	1	1	1	1	-	-
CO5	3	3	2	2	1	1	2	2	2	-	1	1	-	-
AVG	3	2.8	2.40	2.4	1.2	1	1.2	1.8	1.8	0.8	1.2	1.2	_	-

Course Code: CET 415

Course Name: ENVIRONMENTAL IMPACT ASSESSMENT

Semester: 7

СО	Course outcome	Knowledge level
CET415.1	To appreciate the need for minimizing the environmental impacts of developmental activities	K3
CET415.2	To understand environmental legislation & clearance procedure in the country	К3
CET415.3	To apply various methodologies for assessing the environmental impacts of any developmental activity	К3
CET415.4	To prepare an environmental impact assessment report	K3
CET415.5	To conduct an environmental audit	K2

COURSE OUTCOMES

CO - PO - PSO MAPPING

COURS	SE COE T415	DE:	-	ENVII	SEMESTER: 7									
CO	РО	PO	PO	PO	РО	PO	РО	PO	PO	PO	PO	РО	PSO	PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CET415.1	-	-	-	-	-	2	2	-	-	-	-	-	2	2
CET415.2	-	-	-	-	-	2	-	-	-	-	-	-	2	2
CET415.3	2	-	-	3	2	-	3	-	-	-	-	-	2	2
CET415.4	-	-	-	2	-	2	2	3	-	3	-	-	2	2
CET415.5	-	-	-	2	1	-	2	2	-	2	-	-	2	2
AVG.	2	-	-	2.33	1.5	2	2.25	2.5	-	2.5	-	-	2	2

Course Code: CST 473 Course Name: Natural Language Processing

Semester:7

CO	Course outcome	Knowledge
		level
CST473.1	Summarize basic concepts and learning methods for NLP	К2
CST473.2	Demonstrate the relevance of pre-processing methods on text data	К3
CST473.3	Compare different language modelling techniques	К3
CST473.4	Make use of NLP techniques in Text Classification and Information Retrieval	К3
CST473.5	Explain Information Extraction, Relation Detection, QA Systems and Machine Translation	K2

COURSE OUTCOMES

<u>CO - PO - PSO MAPPING</u>

	Programme Outcomes													PSO	
СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	2	-	-	-	-	-	-	-	-	-	-	2	2	-	
CO2	2	3	2	-	2	-	-	-	-	-	-	1	2	-	
CO3	2	3	2	-	2	-	-	-	-	-	-	2	2	-	
CO4	2	3	3	-	-	-	-	-	-	-	-	3	2	-	
CO5	1	-	-	-	-	-	-	-	-	-	-	1	-	-	
AVG	1.8	3	2.3	-	2	-	-	-	-	-	-	1.8	2	-	

COURSE OUTCOMES

СО	Course Outcome	Knowledge level
ADD 416.1	Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply).	КЗ
ADD 416.2	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).	КЗ
ADD 416.3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).	КЗ
ADD 416.4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).	К3
ADD 416.5	Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).	К3
ADD 416.6	Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply).	КЗ

CO-PO-PSO MAPPING

	Programme Outcomes													PSO		
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
CO1	2	2	2	1	2	2	2	1	1	1	1	2	1	1		
CO2	2	2	2		1	3	3	1	1		1	1				
CO3									3	2	2	1	1	1		
CO4					2			3	2	2	3	2	1	1		
CO5	2	3	3	1	2							1	1	1		
CO6					2			2	2	3	1	1				
AVG	2	2.33	2.33	1	1.8	2.5	2.5	1.75	1.8	2	1.6	1.33	1	1		

COURSE OUTCOMES

СО	Course outcome	Knowledge level
ADT402.1	Explain the various business analytical concepts, applications and models.	K2
ADT402.2	Make use of statistical models for business analytics in data management.	К3
ADT402.3	Apply tableau tool for business analytics applications.	K3
ADT402.4	Make use of business analytical tools and techniques in Web Analytics.	К3
ADT402.5	Demonstrate business analysis with data science tool kits.	К3

<u>CO - PO - PSO MAPPING</u>

	Programme Outcomes													PSO	
CO	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12								PSO1	PSO2					
CO1	3					-	-	-	-	-	-	-	-	2	
CO2	2	2	1	2		-	-	-	-	-	-	-	-	2	
CO3	3	2	2	2	2	-	-	-	-	-	-	-	-	2	
CO4	2	2	2	2	2	-	-	I	-	-	-	-	-	1	
CO5	2	1	1	2	2	-	-	-	-	-	-	-	-	1	
AVG	2.4	1.4	1.2	1.6	1.2	-	-	-	-	-	-	-	-	1.6	

Programme: Bachelor of Technology Course Name: Image Processing Techniques

COURSE OUTCOMES

CO	Course outcome	Knowledge level
CST438.1	Explain the concepts of image formation and the basis of digital image processing.	К2
CST438.2	Demonstrate the role of image transforms in representing, highlighting, and modifying image features.	К3
CST438.3	Solve image enhancement problems using spatial and frequency domain techniques.	К3
CST438.4	Make use of the concept of image restoration and image segmentation techniques in real-world problems.	К3
CST438.5	Interpret morphological operations, image representation, and description techniques.	K2

CO - PO - PSO MAPPING

		Programme Outcomes													
СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	3					-	-	-	-	-	-	-	2	
CO2	3	3			2		-	-	-	-	-	-	-	2	
CO3	3	2	2				-	-	-	-	-	-	-	2	
CO4	2	2	3	2	2	3	-	-	-	-	-	-	-	2	
CO5	2	3					-	-	-	-	-	-	-	2	
AVG	2.6	2.6	1	.4	.8	.6-	-	-	-	-	-	-	-	2	

Course Name: Miniproject

Course Code: ADD 496 Semester: 8

COURSE OUTCOMES

CO	Course outcome	Knowledge
		level
ADD496.1	Identify technically and economically feasible problems	K3
ADD496.2	Identify and survey the relevant literature for getting exposed to related solutions	К3
ADD496.3	Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions of minimal complexity by using modern tools & advanced programming techniques	К3
ADD496.4	Prepare technical report and deliver presentation	K3
ADD496.5	Apply engineering and management principles to achieve the goal of the project	K3

<u>CO - PO - PSO MAPPING</u>

	Programme Outcomes													PSO	
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	3	2	2	-	1	1	2	2	1	2	1	-	-	
CO2	3	3	3	2	2	2	-	1	2	1	1	2	-	-	
CO3	3	3	3	2	2	1	3	2	2	1	1	1	-	-	
CO4	3	2	2	2	1	-	-	2	1	1	1	1	-	-	
CO5	3	3	2	2	1	1	2	2	2	-	1	1	-	-	
AVG	3	2.8	2.40	2.4	1.2	1	1.2	1.8	1.8	0.8	1.2	1.2	-	-	

Course Code: CST 444 Semester: 8

Course Name: Soft Computing

COURSE OUTCOMES

СО	Course outcome	Knowledge level
CST444.1	Describe soft computing techniques and the basic models of	K2
CST444.2	Solve practical problems using neural networks	К3
CST444.3	Illustrate the operations, model and applications of fuzzy logic	К3
CST444.4	Illustrate the concepts of Genetic Algorithm (К3
CST444.5	Describe the concepts of multi-objective optimization models and the need for using hybrid soft computing approaches	K2

CO - PO - PSO MAPPING

					Prog	ramm	e Outo	comes					PSO .			
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	1	1	1	-	-	-	-	-	-	-	-	1	1	-	-	
CO2	2	3	3	2	-	-	-	-	-	-	-	-	3	3	2	
CO3	2	3	3	-	-	-	-	-	-	-	-	3	2	3	3	
CO4	2	3	3	-	-	-	-	-	-	-	-	3	3	2	3	
CO5	2	3	-	2	1	-	-	-	-	-	-	3	2	3	2	
AVG	1.8	2.6	2	0.8	0.2							2	2.2	2.2	2	

Programme: Bachelor of Technology Course Name: **COMPUTER VISION**

COURSE OUTCOMES

Pre-requisite: NIL

Course Outcome: After the successful completion of this course, the student will be able to:

CET474.1	Summarize basic concepts,terminology,theories, models an methods in the field of computer vision	K2
CET474.2	Explain basic methods of computer vision related to multi-scale representation, edge detection, detection of other primitives, stereo, motion and object recognition.	K2
CET474.3	Describe principles of Segmentation, Motion Segmentation and Classification	K2
CET474.4	Select appropriate object Tracking and detection methods for computer vision applications	К2
CET474.5	Implement a computer vision system for a specific problem	K3

CO - PO - PSO MAPPING

COURS	COURSE CODE: CST 474					COU	RSE N	AME:				SEMESTER: 8		
CS.														
CO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PSO	PSO
<u> </u>	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CET474.1	2	-	2	-	-	-	-	-	-	-	-	2	2	1
CET474.2	2	-	2	-	-	-	-	-	-	-	-	2	2	1
CET474.3	2	-	2	-	-	-	-	-	-	-	-	2	2	1
CET474.4	2	-	2	-	-	-	-	-	-	-	-	2	2	1
CET474.5	2	2	2	2	2	-	-	-	-	-	-	2	2	1
AVG.	2	.33	2	.33	.33	-	-	-	-	-	-	2	2	1

Course Code: CST 468

Course Name: Bio informatics

Semester: 8

COURSE OUTCOMES

СО	Course outcome	Knowledge level
CST468.1	Describe the basic concepts of Bioinformatics with an emphasis on structure, function and synthesis of biomolecules	K2
CST468.2	Identify biological data formats and databases, retrieve bio- sequences, and align biosequences to identify similarity	К3
CST468.3	Employ similarity searching tools and algorithms to align sequences to highlight the similarity, and describe the structure of genes	K3
CST468.4	Demonstrate Protein Structure, visualize protein structure using tools, and explain how proteins interact	К3
CST468.5	Explain the fundamental aspects of Systems Biology, Computational Modeling and properties of models	K2

<u>CO - PO - PSO MAPPING</u>

					Prog	rammo	e Outc	omes					PSO	
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2			-	-	-	-	-	-	-	2	-	-
CO2	2	2	2	2	1	-	-	-	-	-	-	2	-	-
CO3	2	2	2	1	1	-	-	-	-	-	-	2	-	-
CO4	2	2	2	1	-	-	-	-	-	-	-	2	-	-
CO5	2	2	-	-	1	-	-	-	-	-	-	1	-	-
AVG	1.67	2.50	2.40	2.20	0.6	-	-	-	-	-	-	2.00	-	-

Course Code: CST 466

Course Name: Data Mining

Semester: 8

COURSE OUTCOMES

со	Course outcome	Knowledge level
CST466.1	Employ the key process of data mining and data warehousing concepts in application domains.	K2
CST466.2	Make use of appropriate preprocessing techniques to convert raw data into suitable format for practical data mining tasks	K3
CST466.3	Illustrate the use of classification and clustering algorithms in various application domains.	K3
CST466.4	Comprehend the use of association rule mining techniques.	K3
CST466.5	Explain advanced data mining concepts and their applications in emerging domains	K2

CO - PO - PSO MAPPING

PO		Programme outcomes														
со	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
CO1	3	1	-	-	-	-	-	-	-	-	-	1	-	-		
CO2	3	2	1	1	2	-	-	-	-	-	-	1	2	-		
CO3	3	2	2	2	2	-	-	-	-	-	-	1	3	-		
CO4	3	2	2	2	1	-	-	-	-	-	-	1	3	-		
CO5	3	1	-	-	-	-	-	-	-	-	-	1	3	-		
AVG	3	1.6	1	1	1	-	-	-	-	-	-	1	2.2	-		