

Galgotias College of Engineering and Technology, Greater Noida

Statements of Course Outcomes (COs) and Mapping with Program Outcomes (POs) and Program Specific Outcomes (PSOs) : Dept. of CSE : 2018-19

S. No.	Sub Code	COx	Statement of Course Outcomes (COs)	Kx	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2			
			Statement of Course Outcomes (COs) Upon completion of topic concerned, students will be able to :	Blooms Knowledge Level	Engineering knowledge	Problem Analysis	Design/development of solutions	Communication	Investigations of complex problems	Modern tool usage	The Engineer and Society	Environment & sustainability	Ethics	Individual and team work	Communications	Project management and finance	Life Long Learning	Design computer based systems using design, development and test software for different applications			
1	RAS 301	CO-1	Understand the concept of numerical techniques in finding solution of linear system of equations.		3	3	1	2	1	-	-	-	-	-	-	-	1	-	-		
		CO-2	Analyze the problems, which are used in engineering and how to solve these problems using different transforms.		3	2	2	3	1	-	-	-	-	-	-	-	-	-	-	-	
		CO-3	Comprehend the meaning of analytic function, singularities and Laurent series in evaluating real integral.		3	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	
		CO-4	Construct, analyze and evaluate the solution of differential equation by using numerical methods.		3	3	3	2	3	-	-	-	-	-	-	-	-	-	-	-	
		CO-5	Evaluate the root of the algebraic and transcendental equation by using numerical method.		3	3	2	3	2	-	-	-	-	-	-	-	-	-	-	-	
		CO-6	Analyze the behavior of statistical data by using testing of hypothesis and different probability distributions.		3	3	2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
			RAS 301			3	2.67	1.83	2.33	1.67	-	-	-	-	-	-	-	-	1	-	-
2	RCS 301	CO-1	Define the basic mathematical objects and algebraic structures with its properties.		3	2	3	-	2	-	-	-	-	-	-	-	3	2	-		
		CO-2	Illustrate simple proofs for mathematical objects, algebraic structures and possess the ability to verify it.		3	3	3	-	2	-	-	-	-	-	-	-	-	3	2	-	
		CO-3	Illustrate the concept of partial order sets and Lattices.		3	3	3	-	2	-	-	-	-	-	-	-	-	3	2	-	
		CO-4	Construct the K-map by simplifying the Boolean expressions and functions.		3	3	3	-	2	-	-	-	-	-	-	-	-	3	2	-	
		CO-5	Identify the formal logical arguments using propositional and predicate logic		3	3	3	1	2	-	-	-	-	-	-	-	-	3	2	-	
		CO-6	Apply counting and discrete structural techniques to solve multidisciplinary applications.		3	3	3	1	2	-	-	-	-	-	-	-	-	3	2	-	
			RCS 301			3	2.83	3	1	2	-	-	-	-	-	-	-	3	2	-	
3	RCS 302	CO-1	Understand the fundamentals of Computer Organization and Architecture.		1	-	-	-	-	-	-	-	-	-	-	-	2	3	-		
		CO-2	Analyze the working of Control unit over computer system.		2	2	2	1	-	-	-	-	-	-	-	-	2	3	-		
		CO-3	Identify the application role of various types of computer instructions and use them for solving problems.		2	2	2	2	-	-	-	-	-	-	-	-	2	3	-		
		CO-4	Illustrate the working principles of memory organization of computer system.		2	2	2	2	-	-	-	-	-	-	-	-	2	3	-		
		CO-5	Evaluate the various mapping scheme in computer system.		2	2	2	2	-	-	-	-	-	-	-	-	2	3	-		
			Design and assemble the typical I/O interface and apply a combination of hardware and software to address a problem.		3	2	2	3	2	-	-	-	-	-	-	-	2	3	-		
			RCS 302			2	2	2	2	2	-	-	-	-	-	-	2	3	-		
4	RCS 305	CO-1	Understand and apply the concept of arrays, linked lists, stacks, queues, trees, and graphs.		3	2	-	-	-	-	-	-	-	-	-	-	3	-			
		CO-2	Demonstrate the operations of linear and nonlinear Data Structures.		3	2	-	-	-	-	-	-	-	-	-	-	3	-			
		CO-3	Implementation of Trees and Graphs and perform various operations on these data structure.		3	2	2	-	-	-	-	-	-	-	-	-	3	-			
		CO-4	Understand the concept of recursion, application of recursion and its implementation.		3	3	2	-	-	-	-	-	-	-	-	2	3	2			
		CO-5	Analyse time and space complexity of different data structure techniques.		3	3	2	-	-	-	-	-	-	-	-	-	3	2			
		CO-6	Discuss and apply the concept of insertion, deletion, searching and sorting for problemsolving.		2	2	2	2	-	-	-	-	-	-	-	2	2	2			
			RCS 305			2.83	2.33	2	2	-	-	-	-	-	-	-	2	2.83	2		
5	REC 301	CO-1	Understand fundamental concepts and techniques used in digital electronics		2	-	-	-	-	-	-	-	-	-	-	-	2	-			
		CO-2	Examine the structure of various number system and their application in digital design		2	2	2	-	-	-	-	-	-	-	-	-	-	-			
		CO-3	Understand, analyze and design various combinational and sequential circuit		2	2	2	-	-	-	-	-	-	-	-	-	2	-			
		CO-4	Design optimise solution for digital applications.		2	2	3	-	-	-	-	-	-	-	2	-	2	-			
		CO-5	Identify and prevent various hazards and timings problems in a digital design		-	2	1	-	-	-	-	-	-	-	-	-	-	-			
		CO-6	Build and troubleshoot digital circuits		2	2	2	3	2	-	-	-	-	-	-	1	2	3			
			REC 301			2	2	2	3	2	-	-	-	-	-	2	1	2	3		
6	RVE 301	CO-1	Understand the need, concept and content of value-education in individual's life and modifies their aspirations for happiness & prosperity.		-	-	-	-	-	3	3	3	3	2	-	3	-	-			
		CO-2	Comprehend the term self-exploration and its application for self-evaluation and development.		-	-	-	-	-	3	3	3	3	2	-	3	-	-			
		CO-3	Reconstruct the concepts about different values & discriminate between them.		-	-	-	-	-	3	3	3	3	2	-	3	-	-			
		CO-4	Analyze the concept of co-existence & evaluate the program to ensure self regulation.		-	-	-	-	-	3	3	3	3	2	-	3	-	-			
		CO-5	Identify the holistic perception of harmony at level of self, family, society, nature and explain it by various examples.		-	-	-	-	-	3	3	3	3	2	-	3	-	-			
		CO-6	Apply professional ethics in their future profession & contribute for making a value based society.		-	-	-	-	-	3	3	3	3	2	-	3	-	-			
			RVE 301			-	-	-	-	-	3	3	3	3	2	-	3	-	-		

7	RCS 351	CO-1	Understand and remember the basic concepts of prolog programming.		3	3	3	-	2	-	-	-	-	-	-	3	2	2	
		CO-2	Implement the concept of set theory, recursive functions and combinatorics.		3	3	3	-	2	-	-	-	-	-	-	-	3	2	2
		CO-3	Implement state of art problems using the concepts of discrete structures.		3	3	3	2	2	-	-	-	-	-	-	-	3	2	2
		RCS 351				3	3	3	2	2	-	-	-	-	-	-	3	2	2
8	RCS 352	CO-1	Understand the fundamentals of Computer Organization and Architecture.		1	2	2	1	3	-	-	-	-	-	-	2	3	3	
		CO-2	Describe the working of Control unit of computer system.		1	2	2	1	3	-	-	-	-	-	-	2	3	3	
		CO-3	Understand the role of various types of computer instructions and use them for solving problems.		1	2	2	1	3	-	-	-	-	-	-	2	3	3	
		RCS 352				1	2	2	1	3	-	-	-	-	-	2	3	3	
9	RCS 355	CO-1	Apply the knowledge of data structure concepts		2	2	2	2	2	-	-	-	-	-	-	3	3	3	
		CO-2	Choose the appropriate data structure for algorithm design.		3	3	3	3	2	-	-	-	-	-	-	3	3	3	
		CO-3	Apply fundamental of data structure for Sorting, Searching, Stack& Queues.		3	3	3	3	2	-	-	-	-	-	-	3	3	3	
		RCS 355				3	2.8	2.8	2.8	2	-	-	-	-	-	3	3	3	
10	REC 351	CO-1	Understand, analyze, construct and troubleshoot simple combinational and sequential circuits.		2	2	2	-	2	-	-	-	2	-	-	2	2	-	
		CO-2	Design and troubleshoot a different logic circuits		3	3	3	3	2	-	-	-	2	-	-	2	2	-	
		CO-3	Measure and record the experimental data, analyze the results, and prepare a formal laboratory report		3	3	3	3	2	-	-	-	2	-	-	2	2	-	
		RCS 354				2.6	2.6	2.6	3	2	-	-	-	2	-	-	2	2	-
11	RAS 402	CO-1	Recall an understanding of the basic concepts of ecology and environment. (K1)		2	-	2	-	-	-	3	-	-	-	-	2	-	-	
		CO-2	Relate the human needs and activities to their impact on environment and ways to achieve environment conservation. (K3)		-	-	2	-	-	-	3	-	-	-	-	2	-	-	
		CO-3	Identify the need for finding substitutes and conservation of scarce natural resources. (K2)		-	-	2	-	2	2	3	-	-	-	-	2	-	-	
		CO-4	Evaluate the applicability and relative importance of different types of energy sources. (K5)		3	-	2	-	-	-	3	-	2	-	-	-	-	-	
		CO-5	Analyze existing environmental problems for designing suitable measures to control it. (K4)		-	3	3	-	2	2	3	2	-	-	-	2	-	-	
		CO-6	Extend the educational components of environment to individual, social, national and legal variable for problem solving. (K4)		-	-	2	-	3	3	2	2	-	2	-	3	-	-	
		RAS 402				2.5	3	2.16	-	2.33	2.33	2.83	2	2	2	-	2.2	-	-
12	RCS 401	CO-1	Understand the structure, types and functions of modern Operating Systems.	K2	3	2	2	2	2	1	-	-	-	-	-	2	3	3	
		CO-2	Identify and apply knowledge of various software and hardware synchronization tools and algorithms for solving critical section problem in concurrent processes.	K3	3	2	2	2	2	1	-	-	-	-	-	2	3	3	
		CO-3	Apply and analyze process management and memory management concepts to solve various software problems.	K3	3	2	3	2	2	1	-	-	-	-	-	3	3	3	
		CO-4	Understand, review and analyze different file handling, I/O and disk management strategies with various access control techniques.		3	3	3	2	2	1	-	-	-	-	-	3	3	3	
		CO-5	Analyze the concepts of deadlock in operating systems and apply the deadlock handling techniques in multiprogramming system.		3	3	3	3	2	1	-	-	-	-	-	3	3	3	
		CO-6	Apply and relate the concepts of process, memory and file management, concurrency control, deadlock handling with various modern operating systems like Linux, Windows, Mac etc		3	3	3	3	2	1	-	-	-	-	-	3	3	3	
		RCS 401				3	2.5	2.67	2.33	2	1	-	-	-	-	-	2.67	3	3
13	RCS 402	CO-1	Learn the basic concepts of Software Engineering and know classical and evolving software engineering SDLC models		1	-	-	-	-	-	-	-	-	-	-	-	-	1	
		CO-2	Understand the process of gathering and identifying the requirements for the software development and Quality Standards.		2	-	-	-	2	-	-	-	1	1	-	-	-	1	
		CO-3	Demonstrate use of various design techniques and principles to solve software engineering problems and meet desired needs within realistic constraints.		2	-	2	-	2	-	-	-	-	2	-	-	-	2	
		CO-4	Summarise software testing methods to verify, validate software systems and evaluate software quality and correctness.		2	-	2	-	2	-	-	-	2	2	-	-	-	2	
		CO-5	Outline Software maintenance approaches and processes for management of software development projects.		2	-	-	-	2	2	-	-	2	2	2	-	-	2	
		CO-6	Apply basic software quality assurance practices to ensure that software designs, development, and maintenance meet or exceed applicable standards.		2	-	2	-	2	2	-	-	2	2	-	2	2	3	
		RCS 402				1.8	-	2	-	2	2	-	-	1.75	1.8	2	2	2	1.83
14	RCS 403	CO-1	Recall and identify different concepts of set theory, proving techniques and also be able to explain the language classifications.		3	3	3	3	-	-	-	-	-	-	-	3	3	2	
		CO-2	Analyse and prove the equivalence of languages and illustrate how to design finite state machines and convert regular expressions to Finite State Automata.		3	3	3	2	-	-	-	-	-	-	-	3	3	2	
		CO-3	Construct pushdown automata and demonstrate the construction of context free grammars.		3	3	2	2	-	-	-	-	-	-	-	3	3	2	
		CO-4	Demonstrate the construction of a Turing Machine.		3	2	2	2	-	-	-	-	-	-	-	2	3	2	
		CO-5	Classify the problems based on their complexity.		2	2	3	2	-	-	-	-	-	-	-	2	3	2	
		CO-6	Perform adder, subtraction, multiplication, division by using Turing Machines.		2	2	3	3	-	-	-	-	-	-	-	3	3	2	
		RCS 403				2.67	2.5	2.67	2.33	-	-	-	-	-	-	-	2.67	3	2

15	REC 405	CO-1	Understand the fundamentals of microprocessor systems	2				2	-	-	-	-	-	-	-	-	-	-	
		CO-2	Describe the instruction set of microprocessor system.	2				2	-	-	-	-	-	-	-	-	-	-	-
		CO-3	Design simple assembly language programs for particular applications.	2	2	2	2	-	-	-	-	-	-	-	-	-	-	3	3
		CO-4	Understand various types of interrupts in 8085.	2				-	-	-	-	-	-	-	-	-	-	3	-
		CO-5	Understand the various data transfer schemes in 8085.	2				-	-	-	-	-	-	-	-	-	2	3	-
		CO-6	Interface programmable peripheral devices with 8085 microprocessor for particular application.	2	2	2		-	-	-	-	-	-	-	-	-	2	3	3
		REC 405				2	2	2	2	2	-	-	-	-	-	-	-	2	3
16	ROE 044	CO-1	Recall the various contributions of scientists and research organizations in astrophysical activities.	3	2	1	2	2	-	2	-	-	1	-	3	-	-	-	
		CO-2	Illustrate the problems of eye related to atmosphere, compare non optical telescopic with optical telescopic techniques and measurement techniques in astrophysics (SPACE).	3	2	1	2	3	-	2	-	-	1	-	3	-	-	-	
		CO-3	Apply physics principles to the interpretation of a broad range of astrophysical observations like solar system.	3	3	1	2	2	-	2	-	-	1	-	3	-	-	-	
		CO-4	Discover the origin of stars, comets, asteroids and satellites in SPACE.	3	3	1	2	2	-	2	-	-	1	-	3	-	-	-	
		CO-5	Analyse the importance of galaxy origin and its types.	3	3	1	2	3	-	2	-	-	1	-	3	-	-	-	
		CO-6	Deduce the laws and principles of cosmology concepts in universe.	3	3	1	2	3	-	2	-	-	1	-	3	-	-	-	
		ROE 044				3	2.3	1	2	2.5	-	2	-	-	1	-	3	-	-
17	RCS 451	CO-1	Remember and understand basic concepts of operating system.	2	2	2	-	2	1	-	-	2	-	2	-	3	3		
		CO-2	Apply the acquired knowledge to analyze the different approaches for the allocation of system resources by operating System.	3	3	3	3	-	-	-	-	-	-	-	2	3	3		
		CO-3	Examine and propose new / alternate solutions for different operating system tasks.	3	3	3	3	2	1	-	-	2	-	2	2	3	3		
		RCS 451				2.6	2.6	2.6	3	2	1	-	-	2	-	2	2	3	3
18	RCS 452	CO-1	Understands software engineering practices used over entire system development lifecycle.	3	2	2	2	2	-	-	-	3	3	-	3	3	3		
		CO-2	An ability to analyze and design software based on the requirement specification using UML tools.	3	3	3	3	3	-	-	-	3	3	-	3	3	3		
		CO-3	Implement a new software engineering project by effectively applying software engineering practices.	3	3	3	3	3	-	-	-	3	3	-	3	3	3		
		RCS 452				3	2.6	2.6	2.6	2.6	-	-	-	3	3	-	3	3	3
19	RCS 453	CO-1	Master Regular languages and finite automata, Master Context-Free languages, push-Down automata, and Turing Recognizable Languages.	3	3	2	2	1	-	-	-	-	-	-	2	1	1		
		CO-2	Exposed to A broad overview of the theoretical foundations of computer science	3	3	-	2	1	-	-	-	-	-	-	2	2	2		
		CO-3	Familiar with thinking analytically and intuitively for problem- Solving situations in related areas of theory in computer science.	3	3	3	3	1	-	-	-	-	-	-	2	2	2		
		RCS 453				3	3	2.5	2.33	1	-	-	-	-	-	2	1.67	1.67	
20	RCS 454	CO-1	Learn and understand the basic concepts and constructs of Python programming.	2	1	2	1	2	-	-	-	2	-	-	-	-	3		
		CO-2	Analyze and apply the appropriate programming constructs for problem solving.	3	2	3	1	2	-	-	-	2	-	-	2	-	3		
		CO-3	Implement projects using Python programming skills.	3	-	3	-	2	1	-	-	2	-	2	2	3	3		
		RCS 454				2.6	1.5	2.6	1	2	1	-	-	2	-	2	2	3	3
21	RAS 501	CO-1	Understand the basic concepts of Engineering Economics & theory of demand.	2	-	3	-	-	3	3	3	-	3	-	3	-	-		
		CO-2	Understand concept of supply and make use of various methods of demand forecasting for estimating demand of any product.	2	-	2	2	-	3	3	2	3	3	-	3	-	-		
		CO-3	Explain basic concepts related to production and cost	-	-	2	-	-	3	3	3	2	3	3	3	-	-		
		CO-4	Outline of various market structures.	-	-	2	-	-	3	3	2	2	2	2	3	-	-		
		CO-5	Understand nature and structure of Indian economy and basic concepts related to NI, Inflation and business cycle.	-	-	2	-	-	3	3	2	2	2	2	3	-	-		
		RAS 501				2	-	2.2	2	-	3	3	2.4	2.25	2.6	2.33	3	-	-
22	RCS 501	CO-1	Define basic terms of database management system and explain Entity relationship model.	1	1	3	-	2	-	-	-	-	-	-	2	2	3		
		CO-2	Understand the concept of relational data model and use of languages such as SQL, Relational Algebra and Relational Calculus	2	2	1	2	2	-	-	-	-	-	-	2	2	3		
		CO-3	Make use of design principles of normalization to translate conceptual model into relational database model.	2	2	3	2	2	-	-	-	-	-	-	2	2	3		
		CO-4	Illustrate different transaction processing and distributed database concept.	2	2	1	2	1	-	-	-	-	-	-	3	2	3		
		CO-5	Outline various concurrency control and deadlock handling techniques during concurrent transaction processing.	2	2	2	2	1	-	-	-	-	-	-	3	2	3		
		CO-6	Demonstrate Recovery mechanism from transaction failures.	2	2	2	2	2	-	-	-	-	-	-	3	2	3		
		RCS 501				1.83	1.83	2	2	2	-	-	-	-	-	-	2.5	2	3
23	RCS 502	CO-1	Remember the complexity of sorting, searching and specific algorithms {Based on Divide and Conquer, Greedy, Dynamic, Backtracking, Branch and Bound, Randomization and Approximation	1	-	-	-	-	-	-	-	-	-	-	-	-	-		
		CO-2	Understand the complexity of these algorithms	1	-	-	-	-	-	-	-	-	-	-	-	-	1		
		CO-3	Solve problems based on discussed algorithms	2	3	-	-	-	-	-	-	-	-	-	-	-	2		
		CO-4	Analyse complexity of these algorithms	3	3	2	3	-	-	-	-	-	-	-	-	1	3		
		CO-5	Determine or compare the proper use of these algorithms	3	3	3	2	-	-	-	-	-	-	-	-	1	3		
		CO-6	Design or create new efficient algorithm	3	3	3	3	-	-	-	-	-	-	-	-	3	1	3	
		RCS 502				2.16	3	2.66	2.66	-	-	-	-	-	-	-	3	1	2.4

24	RCS 503	CO-1	Introduce the principles and techniques involved in design and implementation of programming languages		3	-	-	-	-	-	-	-	-	-	-	3	-	
		CO-2	Understand basic syntax related concepts and analyse semantic behaviour of programs.		2	2	2	2	-	-	-	-	-	-	-	-	2	-
		CO-3	Familiarization with the sub-programming, variable binding, scoping rules and parameter passing.		2	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO-4	Analyze the features of object- oriented programming, concurrency control and Event Handling.		-	2	-	-	-	-	-	-	-	-	-	2	2	-
		CO-5	Implement object oriented and functional programming concepts for large scale software development.		2	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO-6	Overall advancement toward creation of new modern programming languages.		3	-	-	2	-	-	-	-	-	-	-	2	2	-
		RCS 503					2.7	2	2	2	2	-	-	-	-	-	-	2
25	RCS 052	CO-1	Remember the basics behind various Web Technologies and core Java.		2	2	2	2	2	-	-	-	-	-	-	2	2	3
		CO-2	Understand the concept of web page designing through HTML, CSS and XML languages.		2	2	3	2	2	-	-	-	-	-	-	2	2	3
		CO-3	Understand the concept and need of Java scripting, Networking using Java in Web page designing.		2	2	3	2	2	-	-	-	-	-	-	2	2	3
		CO-4	Analyze and apply the concept of OOP, Web Page Designing, Scripting, Networking, Servlet's & JSP for designing a dynamic web page.		2	3	3	3	3	-	-	-	3	-	-	3	2	3
		CO-5	Analyze and apply the concept of EJB, JDBC for designing a dynamic web page.		2	2	3	2	2	-	-	-	3	-	-	2	2	3
		CO-6	Implement a web solution for a scenario.		3	2	3	3	3	-	-	-	3	-	-	3	2	3
		RCS 052					2.16	2.16	2.83	2.33	2.33	-	-	-	3	-	-	2.33
26	RUC 501	CO-1	Understand about the core of Information System (IS), principles and its security		2	3	-	-	-	3	-	-	-	1	-	1	-	-
		CO-2	Analyze system and applications for Cyber Security threats, vulnerabilities and also different classes of attack and their counter measures.		2	3	-	-	-	2	-	-	-	1	-	1	-	-
		CO-3	Identify the key components of Physical Security and Network Architecture for Secure Information System.		-	-	-	-	-	3	2	-	-	1	-	1	-	-
		CO-4	Understand the development of Policies, Procedures, and Guidelines for implementing Security.		1	-	-	-	-	-	-	3	-	1	-	1	-	-
		CO-5	Illustrate Current Trends in information Security in areas of Cloud Computing, Supply Chain Management and Outsourcing		1	-	-	-	-	2	-	-	-	1	-	1	-	-
		CO-6	Learn about Cyber Security Policies, Information Security Standards -ISO, IT Act, Copy rights, Cyber Laws to make our system secure.		1	-	-	-	-	3	2	3	-	1	-	1	-	-
		RUC 501					1.4	3	-	-	-	2.6	2	3	-	1	-	1
27	RCS 551	CO-1	Understand the basic concepts of Database and ER-Modelling.		1	1	2	-	2	1	-	-	-	2	-	2	-	-
		CO-2	Define and apply various types of SQL queries.		1	1	2	1	-	-	-	-	-	-	2	2	-	
		CO-3	To manage database tables, implement and execute - cursor, procedure, functions and triggers in oracle.		1	1	2	2	2	1	-	-	2	-	2	2	2	-
		RCS 551					1	1	2	1.5	2	1	-	-	2	-	2	2
28	RCS 552	CO-1	To understand and remember certain algorithms approaches.		2	1	2	-	2	-	-	-	2	-	2	-	3	3
		CO-2	To analyse and apply these algorithms.		3	3	3	3	-	-	-	-	-	-	2	3	3	
		CO-3	To implementation and execute these algorithms.		3	3	3	3	2	-	-	-	2	-	2	2	3	3
		RCS 552					2.6	2.3	2.6	3	2	-	-	-	2	-	2	2
29	RCS 553	CO-1	State the importance of PPL and describe fundamental elements of PPL.		2	2	1	-	2	-	-	-	3	-	-	2	3	3
		CO-2	Able to understand the fundamental concepts of most programming languages & the trade-off between language design and implementation.		3	3	3	-	2	-	-	-	3	-	-	2	3	3
		CO-3	Able to compare programming languages, assess programming languages critically and scientifically.		3	3	3	-	2	-	-	-	3	-	-	2	3	3
		RCS 553					2.6	2.6	2.3	-	2	-	-	-	3	-	-	2
30	RCS 554	CO-1	Understand and remember basic concepts related to various web technologies.		3	3	3	3	2	-	-	-	-	-	2	2	3	
		CO-2	Analyze and choose the appropriate web technology for its problem domain and be able to write code in HTML, XML, Javascript, JSP, Servlets for web page designing		3	2	2	2	2	-	-	-	-	-	3	2	3	
		CO-3	Implement complete end to end web solution.		3	3	3	3	3	-	-	-	3	-	-	2	2	3
		RCS 554					3	2.6	2.6	2.6	2.33	-	-	-	3	-	-	2.3
31	RAS 601	CO-1	Student will be able to understand the concept of industrial management.		-	3	3	3	2	-	-	-	-	-	-	-	-	
		CO-2	Student will be able to understand the functions & principles of management and basic concept of HRM.		3	-	3	3	-	-	-	-	-	-	-	-	-	
		CO-3	Student will be able to understand the process of work study and inventory control techniques		-	-	3	3	3	-	-	-	-	-	-	-	-	
		CO-4	Student will be able to apply various quality control techniques for process control & product control.		3	3	-	2	-	2	-	-	-	-	-	-	-	
		CO-5	Student will be able to understand basic concepts related to project management and control techniques.		-	-	-	2	-	-	-	-	3	3	2	-	-	
		RAS 601					3	3	3	2.6	2.5	2	-	-	3	3	2	-

32	RAS 602	CO-1	Comprehend social relations in industry/organization and correlate the dynamics of diverse context of Indian society.	-	-	-	-	-	3	2	-	1	-	-	2			
		CO-2	Understand the global rise and development of industry and empower themselves to analyze and evaluate different aspects of industrialization.	-	-	2	-	-	3	2	-	-	-	-	-	2		
		CO-3	Demonstrate the implications of policies and its consequences in the context of industrialization and its growth in India.	-	-	2	-	-	2	3	-	-	-	-	-	-		
		CO-4	Evaluate the social consequences of modernization, automation and industrial activities on the ecosystem thereby, sensitizing the engineers on public health and safety issues which shall serve as cornerstone for cultural, societal and environmental considerations.	-	-	3	-	-	3	2	-	-	-	-	-	2		
		CO-5	Envisage prospective models of industrialization across the globe to understand the consumer society and the sociological concerns of industrial development in the present world.	-	-	2	-	-	2	3	-	-	-	-	-	-		
		CO-6	Gain and recognize the need for bridging the implications of sociological theories with engineering sciences and encourage themselves for lifelong learning.	-	-	1	-	-	3	1	-	-	-	-	-	2		
		RAS 602				-	-	2.25	-	-	2.6	2.4	-	1	-	-	2	
33	RCS 061	CO-1	Remember the basic concepts of Internet of Things (IoT)	2	1	2	1	3	1	1	-	-	-	-	-	2	-	
		CO-2	Understand the hardware concepts of IoT, Arduino, Raspberry pi and Intel boards.	2	3	3	2	3	1	1	-	-	-	-	-	2	-	
		CO-3	Understand digital sensors, actuators Radio-Frequency Identification (RFID) and wireless sensor networks in IoT.	2	2	2	1	3	1	1	-	-	-	-	-	2	-	
		CO-4	Analyse the Network & Communication aspects in IoT for design and development.	2	3	2	2	3	1	1	-	-	-	-	-	3	-	
		CO-5	Choose better design principles, Hardware and Network/Communication aspects for IoT	2	3	3	2	3	1	1	-	-	-	-	-	3	-	
		CO-6	Create IoT applications such as Smart metering, e-health, automotive applications, home automation, smart cards, designing of smart streetlights in smart city.	2	3	3	2	3	1	3	-	-	-	-	-	3	3	
		RCS 061				2	2.5	2.5	1.67	3	1	1.33	-	-	-	-	2.5	3
34	RCS 601	CO-1	Remember the functions of each and every layer in OSI and TCP/IP model as well as the application layer protocols.	2	1	2	-	-	-	-	-	-	-	-	2	-	-	
		CO-2	Explain the types of transmission media with real time uses.	2	2	3	-	1	1	-	-	-	-	-	2	1	1	
		CO-3	Classify the functions of data link layer and apply it on networking paradigms.	2	2	2	-	1	1	-	-	-	-	-	3	1	1	
		CO-4	Explain the routing protocols and analyze how to assign the IP addresses for the given network.	2	2	2	-	1	1	-	-	-	-	-	2	2	1	
		CO-5	Explain the services and design issues of Transport layer, Session layer and Presentation layer and able to Compare and contrast TCP and UDP protocol.	3	3	3	-	2	1	1	-	-	-	-	3	2	1	
		CO-6	Analyze the requirements for a given organizational structure and adopt the most appropriate networking architecture and technologies.	2	2	2	1	1	1	2	-	-	-	-	2	2	1	
		RCS 601				2.17	2	2.33	1	1.2	1	1.5	-	-	-	2.33	1.6	1
35	RCS 602	CO-1	Remember the functionality of each phases of compiler and the language processing system.	2	1	2	-	-	-	-	-	-	-	-	2	1	-	
		CO-2	Understand various Parsing techniques and its implementation on ambiguous grammar.	2	2	3	-	1	-	-	-	-	-	-	2	3	1	
		CO-3	Apply syntax directed translation scheme and implement it using intermediate code and postfix notation.	2	2	2	-	1	-	-	-	-	-	-	3	3	1	
		CO-4	Explain the symbol table and their implementation with stack allocation scheme.	2	2	2	-	1	-	-	-	-	-	-	2	3	2	
		CO-5	Apply design issues of Target Language for generation of "if target code", "basic blocks" and "flow graph".	3	3	3	-	2	-	-	-	-	-	-	3	3	2	
		CO-6	Analyze various optimization techniques with Directed Acyclic Graph representation of basic blocks and algebraic law.	2	2	2	2	1	-	-	-	-	-	-	2	3	2	
		RCS 602				2.17	2	2.33	2	1.2	-	-	-	-	-	2.33	2.67	1.6
36	RCS 603	CO-1	Understand the basics of computer graphics and geometrical primitives.	2	2	2	-	2	-	-	-	-	-	3	2	2		
		CO-2	Demonstrate representation of quadric surface and curves.	2	2	3	-	3	-	-	-	-	-	3	2	2		
		CO-3	Translate algorithm to draw geometrical primitives and demonstrating transformations in 2D and 3D.	3	2	3	-	3	-	-	-	-	-	3	2	2		
		CO-4	Apply different clipping methods on graphical primitives in 2-D and 3D.	3	3	2	-	3	-	-	-	-	-	2	3	3		
		CO-5	Compare various projections for display of 3D graphic representation on 2D screen.	3	3	2	-	3	-	-	-	-	-	2	3	3		
		CO-6	Interpret the natural scene to render it in 2D view using visible surface detection techniques and illumination models.	3	3	3	2	3	-	-	-	-	-	3	3	3		
		RCS 603				2.67	2.5	2.5	2	2.83	-	-	-	-	-	2.67	2.5	2.5
37	RIT 062	CO-1	Identify the scope and necessity of Data Mining & Warehousing for the society.	3	2	3	2	2	-	-	-	-	-	3	3	3		
		CO-2	Describe the design of data warehousing so that it can be able to solve the root problem.	3	2	3	2	3	-	-	-	-	-	3	3	3		
		CO-3	Understand the importance of data mining and the principles of business intelligence	3	3	3	3	3	-	-	-	-	-	3	3	3		
		CO-4	Explain the techniques of clustering, classification, association finding and feature selection on real world data	3	3	3	3	3	-	-	-	-	-	3	3	3		
		CO-5	Describe data visualization, web mining, spatial mining and temporal mining.	3	3	3	3	3	-	-	-	-	-	3	3	3		
			Design a data mining process for an application, including data preparation, modelling and evaluation	3	3	2	3	3	-	-	-	-	-	3	3	3		
		RIT 062				3	2.67	2.83	2.67	2.3	-	-	-	-	-	3	3	3

38	RCS 651	CO-1	To understand the working principle of various communication protocols.		2	2	1	1	-	-	-	-	-	-	1	3	3		
		CO-2	Formulate the algorithms to implement various routing algorithms.		2	3	3	2	-	-	-	-	-	-	-	2	3	3	
		CO-3	To know the concept of data transfer between nodes.		3	3	3	2	-	-	-	-	-	-	-	2	2	3	
		RCS 651				2.3	2.6	2.3	1.7	-	-	-	-	-	-	-	1.7	2.7	3
39	RCS 652	CO-1	Remember and implement the functionality of each phase of compiler in C language.		2	3	3	3	3	2	-	-	-	-	2	-	2	3	3
		CO-2	Implement the parsing techniques of compilation process in C language.		2	3	3	3	3	2	-	-	-	-	2	-	2	3	3
		CO-3	Implement the various optimization techniques in C language.		2	3	3	3	3	2	-	-	-	-	2	-	2	3	3
		RCS 652				2	3	3	3	3	2	-	-	-	-	2	-	2	3
40	RCS 653	CO-1	Understand the basic principles of implementing computer graphics primitives		2	3	3	3	-	-	-	-	-	-	-	1	3	3	
		CO-2	Implementing key algorithms for modeling and rendering graphical data.		2	3	3	3	-	-	-	-	-	-	-	3	3	3	
		CO-3	Develop design and problem-solving skills with application to computer graphics		2	3	3	3	-	-	-	-	-	-	-	2	3	3	
		RCS 653				2	3	3	3	-	-	-	-	-	-	2	3	3	
41	RCS 654	CO-1	Understand the mining techniques for realistic data, and also to conceptualize Data Mining and the need for pre-processing.		2	2	2	-	2	1	-	-	-	2	-	2	-	3	3
		CO-2	Develop the algorithms used for various types of Data Mining Problem.		3	3	3	3	-	-	-	-	-	-	-	2	3	3	
		CO-3	Create algorithms to solve data mining problems using weka tool.		3	3	3	3	2	1	-	-	-	2	-	2	2	3	3
		RCS 654				2.6	2.6	2.6	3	2	1	-	-	-	2	-	2	2	3
42	NCS 071	CO-1	Define the basic terminologies of the testing and role of testing.		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		CO-2	Understand the different types of testing and define the test cases.		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		CO-3	Prepare the testing plan and test suite based upon risk analysis.		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		CO-4	Generate the test data for all possible scenarios and perform exploratory testing.		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		CO-5	Compare system testing with the post deployment testing.		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		CO-6	Develop effective testing strategies for the web applications.		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		NCS 071				2	2	2	2	2	-	-	-	-	2	-	2	3	3
43	NCS 701	CO-1	Understand knowledge of Distributed Systems.		1	1	1	-	2	-	-	-	-	-	-	1	-	-	
		CO-2	Learn limitations and solutions of distributed system.		2	3	2	-	-	-	-	-	-	-	-	2	1	1	
		CO-3	Understand as well as develop a new computing environment		2	3	3	-	-	-	-	-	-	-	-	2	3	-	
		CO-4	Learn about distributed mutual exclusion and distributed deadlock deduction.		2	2	2	-	3	1	-	-	-	-	-	2	-	-	
		CO-5	Understand overall advancement in computing using Distributed Systems.		2	2	3	-	2	1	-	-	-	-	-	2	2	3	
		CO-6	Explain the available commercial distributed operating systems.		2	2	3	1	2	1	-	-	-	-	-	2	2	3	
		NCS 701				1.8	2.2	2.3	1	2.25	1	-	-	-	-	-	1.8	2	2.33
44	NCS 702	CO-1	Recall the fundamental concepts of Intelligence, knowledge representation and Artificial Intelligence.		3	-	-	-	-	-	-	-	-	-	-	2	3	3	
		CO-2	Understand what are intelligent drives and where to use AI concept.		3	2	2	1	-	-	-	-	-	-	-	2	3	3	
		CO-3	Apply the AI methodology to create an intelligent agents and explore the area of AI and their applications.		3	3	2	2	-	2	-	-	-	-	-	3	3	3	
		CO-4	Analyse the concept of reasoning and machine learning of AI in real world and analyse their impacts.		3	3	3	3	2	-	-	-	-	-	-	3	3	3	
		CO-5	Evaluate the AI impacts on Pattern recognition and perform statistical analysis for measuring outcome of the system.		3	2	3	3	2	-	-	-	-	-	-	2	3	3	
		CO-6	Analyse the impact of AI based applications		3	2	3	-	3	2	-	-	-	-	-	3	3	3	
		NCS 702				3	2.4	2.6	2.25	2.3	2	-	-	-	-	-	2.5	3	3
45	NIT 701	CO-1	Understand classical encryption techniques and modern block ciphers.		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		CO-2	Illustrate encryption algorithm based on mathematical terminology associated with it.		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		CO-3	Write and implement message authentication codes, digital signatures for enhancing the security.		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		CO-4	Apply the key management and distribution schemes for authentication application.		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		CO-5	Demonstrate IP security features for secure transmission.		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		CO-6	Define basic concepts related to intrusion detection, viruses, threats, firewalls, SSL, etc.,		2	2	2	2	2	-	-	-	-	2	-	2	3	3	
		NIT 701				2	2	2	2	2	-	-	-	-	2	-	2	3	3
46	NOE 071	CO-1	Understand the role and functions of entrepreneur.		-	-	2	-	1	3	1	2	2	-	3	3	-	-	
		CO-2	Formulate and evaluate the project.		2	-	2	-	-	-	-	2	2	-	3	3	-	-	
		CO-3	Understand the concept of NPV & IRR, accountancy, PPC and decision making.		2	-	-	-	-	1	-	2	-	-	2	3	-	-	
		CO-4	Determine process quality, understand marketing, IR, advertising, wages & incentive and inventory control.		2	-	-	-	-	3	-	2	2	-	-	3	-	-	
		CO-5	Understand various aspects of financial management of a project ,		2	-	-	-	-	-	-	2	2	-	3	3	-	-	
		CO-6	Understand legal provisions and assistance provided by various agencies to SSIs		2	-	-	-	-	3	-	2	-	-	-	3	-	-	
		NOE 071				2	-	2	-	1	2.5	1	2	2	-	2.75	3	-	-

47	NCS 751	CO-1	Understand and remember fundamentals of distributed networking approaches.		2	2	2	2	-	-	-	-	-	-	2	-	-	
		CO-2	Understand and remember the certain algorithms approaches in distributed computing.		2	2	2	2	-	-	-	-	-	-	2	-	-	
		CO-3	Implementation of these advance computing algorithms and execute.		3	3	3	3	2	1	-	-	2	-	2	2	-	-
		NCS 751				2.6	2.6	2.6	2.6	2	1	-	-	2	-	2	2	-
48	NCS 752	CO-1	Able to develop a design solution, test and validate the conformance of the developed prototype against the original requirements of the problem		2	3	2	1	2	1	2	2	3	3	1	3	3	3
		CO-2	Work as a responsible member and possibly a leader of a team in developing software solutions		3	3	3	3	3	2	1	1	3	3	3	2	3	3
		CO-3	Self learn new tools, algorithms, and/or techniques that contribute to the software solution of the project		3	3	3	3	3	2	1	1	3	3	2	2	3	3
		NCS 752				2.6	3	2.6	2.3	2.6	1.6	1.3	1.3	3	3	2	2.6	3
49	NCS 753	CO-1	An ability to work in actual working environment.		3	3	3	-	2	-	-	-	3	-	-	2	-	-
		CO-2	An ability to utilize technical resources		3	3	2	-	2	-	-	-	3	-	-	2	-	-
		CO-3	An ability to write technical documents and give oral presentations related to the work completed		2	2	2	-	2	-	-	-	3	-	-	2	-	-
		NCS 753				2.6	2.6	2.3	-	2	-	-	-	3	-	-	2	-
50	NCS 080	CO-1	Provide knowledge of models, methods and tools used to solve regression, classification, feature selection and density estimation problems		3	2	3	3	2	2	-	-	-	-	-	1	2	2
		CO-2	Provide knowledge of learning and adaptation in supervised modes of learning		3	2	3	3	2	2	-	-	-	-	-	1	2	2
		CO-3	Provide knowledge of recognition, decision making and statistical learning problems.		3	2	3	3	2	2	-	-	-	-	-	1	2	2
		CO-4	Provide knowledge of current research topics and issues in Pattern Recognition and Machine Learning		2	2	3	3	2	2	-	-	-	-	-	1	2	2
		CO-5	Provide experience in conducting and presenting a literature review on a research topic		2	2	3	3	2	2	-	-	-	-	-	1	2	2
		CO-6	Provide hands-on experience in analyzing and developing solutions/algorithms capable of learning		3	2	3	3	2	2	-	-	-	-	-	1	2	2
		NCS 080				2.6	2	3	3	2	2	-	-	-	-	-	1	2
51	NCS 085	CO-1	Understand how to analyze compression algorithms and compare performance on large inputs.		3	2	2	-	-	2	1	1	-	-	-	-	-	-
		CO-2	Understand the statistical basis for and performance metrics for lossless compression.		2	2	2	1	-	2	1	1	-	-	-	-	-	-
		CO-3	Understand the conceptual basis for commonly used lossless compression techniques.		3	2	2	2	2	-	-	1	-	-	-	-	2	-
		CO-4	Understand how to use and evaluate several readily available implementations of those techniques.		2	2	3	2	2	-	-	1	-	-	-	1	-	3
		CO-5	Understand the principles of data compression. And Implement and analyse basic coding and compression algorithms.		3	3	2	2	-	-	-	2	2	1	-	-	2	-
		CO-6	Understand the conceptual basis for commonly used lossy compression techniques.		2	2	2	2	2	-	-	1	2	-	-	-	-	3
		NCS 085				2.5	2.1	2.1	1.8	2	2	1	1.1	2	1	-	1	2
52	NCS 801	CO-1	Understand and review the fundamental concepts of digital image processing and its applications in real world.		3	2	2	1	-	-	-	-	-	-	2	2	1	
		CO-2	Analyze the image enhancement in spatial domain as well as frequency domain.		2	3	2	2	1	-	-	-	-	-	2	2	2	
		CO-3	Evaluate the techniques for noise distribution models, sources of noise, types of noises and different restoration methods.		3	2	2	2	1	-	-	-	-	-	2	2	2	
		CO-4	Implement the various morphological operations and analyze their effect on input image.		2	1	2	2	-	-	-	-	-	-	2	2	2	
		CO-5	Identify different objects in input images using digital image processing concepts		3	2	2	2	2	-	-	-	-	-	-	3	3	
		CO-6	Understand the professionals and ethical engineering of pattern recognition using digital image processing.		2	1	2	1	-	1	1	-	-	-	-	2	2	2
		NCS 801				2.3	1.8	2	1.8	1.5	1	1	-	-	-	2	2.1	2
53	NCS 851	CO-1	Understand and remember a programming approach and basic computer		1	2	2	3	3	3	-	2	2	3	-	-	1	2
		CO-2	Understand and bridge the curriculum gap with latest research.		1	2	2	3	3	3	-	2	2	3	-	-	1	2
		CO-3	Analyze and observe the latest research in computer science.		1	2	2	-	3	2	-	2	2	3	-	-	1	2
		NCS 851				1	2	2	2	3	2	-	2	2	3	-	-	1
54	NOE 081	CO-1	Distinguish various conventional & non-conventional energy resources and its applications in various fields to minimize energy use in devices and buildings.		2	2	2	-	-	1	-	-	-	-	2	-	-	
		CO-2	Comprehend the overall solar energy and power plants based on it, Their application, performance & limitations.		2	2	2	-	-	1	-	-	-	-	3	-	-	
		CO-3	Develop an ability to understand resources of Geothermal energy, About MHD and Fuel cells, based plants with their performance and limitations.		2	2	2	-	-	2	-	-	-	-	3	-	-	
		CO-4	Analyze principle of working of Thermo-electrical , thermionic conversion and Wind power and its sources with an assessment skill of the relative costs of energy conservation and energy production in various applications.		2	2	2	-	-	-	-	-	-	-	2	-	-	
		CO-5	Describe the availability & working of bio-mass, OTEC, wave & Tidal wave, Waste Recycling plants.		2	2	2	-	-	-	-	-	-	-	3	-	-	
		NOE 081				2	2	2	-	-	1.33	-	-	-	-	2.6	-	-

55	NCS 852	CO-1	Able to develop a design solution, test and validate the conformance of the developed prototype against the original requirements of the problem		2	3	2	1	2	1	2	2	3	3	1	3	3	3
		CO-2	Work as a responsible member and possibly a leader of a team in developing software solutions		3	3	3	3	3	2	1	1	3	3	3	2	3	3
		CO-3	Self learn new tools, algorithms, and/or techniques that contribute to the software solution of the project		3	3	3	3	3	2	1	1	3	3	2	2	3	3
		NCS 852				2.6	3	2.6	2.3	2.6	1.6	1.3	1.3	3	3	2	2.6	3