

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

S3 CSE

MAT203	Discrete Mathematical Structures	4	Rani Thomas, Savitha P Paul
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CO1	Analyse logical statements to validate arguments using logic techniques and inference theory
CO2	Solve counting problems by applying the elementary counting techniques
CO3	Analysis of generating function and recurrence relation
CO4	Apply set theory and algebraic systems in different computational structures

CO -PO-PSO mapping table																
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	CO/ PSO	PSO1	PSO2	PSO3
CO1	3.0	3.0	3.0	2.00								2.00	CO1			
CO2	3.0	3.0	2.00	2.00								2.00	CO2			
CO3	3.0	3.0	3.0										CO3			
CO4	3.0	3.0	3.0	3.0								2.00	CO4			
Avg	3.0	3.0	2.75	2.33								2.00	Avg			

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CST201	Data Structures	4	Priya K V
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CO1	Design an algorithm for a computational task and calculate the time/space complexities of that algorithm(Cognitive Knowledge Level: Apply)
CO2	Identify the suitable Linear/Non Linear data structure 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(Cognitive Knowledge Level: Apply)
CO3	Store a given dataset using an appropriate Hash Function to enable efficient access of data in the given set and Select appropriate sorting algorithms to be used in specific circumstances (Cognitive Knowledge Level: Apply and Analyse)
CO4	Design and implement Data Structures for effective utilization of memory (Cognitive Knowledge Level: Apply)

CO -PO-PSO mapping table																
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	CO/ PSO	PSO 1	PSO 2	PSO3
CO1	3	2	2			3							CO1			
CO2	3	3	3	2	3	3	3	3				3	CO2	3	3	3
CO3	3	3	3	2	3	3	3	3				3	CO3	3	3	3
CO4	3	3	3	3	3	3	3	3				3	CO4	3	3	3
CO5	3	2	2			3							CO5			
Avg	3	2.6	2.6	2.33	3	3	3	3				3	Avg	3	3	3

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CST203	Logic System Design	4	Dr. Arun Thomas
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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 (Cognitive Knowledge level: Understand)
CO2	Simplify a given Boolean Function and design a combinational circuit to implement the simplified function using Digital Logic Gates (Cognitive Knowledge level: Apply)
CO3	Design combinational circuits - Adders, Code Convertors, Decoders, Magnitude Comparators, Parity Generator/Checker and design the Programmable Logic Devices - ROM and PLA. (Cognitive Knowledge level: Apply)
CO4	Design sequential circuits - Registers, Counters and Shift Registers. (Cognitive Knowledge level: Apply)
CO5	Use algorithms to perform addition and subtraction on binary, BCD and floating point numbers (Cognitive Knowledge level: Understand)

CO -PO-PSO mapping table																
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	CO/ PSO	PSO1	PSO2	PSO3
CO1	3.0	3.0											CO1			
CO2	3.0	2.00	3.0	2.00			2.00						CO2			
CO3	3.0	2.00	3.0	2.00			2.00						CO3			
CO4	3.0	2.00	3.0	2.00			2.00						CO4			
CO5	3.0		3.0										CO5			
Avg	3.0	2.25	3.0	2.00			2.00						Avg			

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CST205	Object oriented programming using Java	4	Dr. R. Satheesh Kumar Megha K. K
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CO1	Apply object-oriented principles in software design process
CO2	Illustrate the use of Primitive Data Types, Operators, Control Statements and Inheritance concept along with the OOP Concepts
CO3	Utilize built-in packages and interfaces,IO streams and files in java to develop programs and and also implement exception handling mechanism in java
CO4	Apply various object-oriented features to computing problems using Java language

CO -PO-PSO mapping table																	
CO/ PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	CO/ PSO	PSO 1	PSO 2	PSO 3	
CO1	3.0	2.00	3.0	2.00								3.0	CO1	3.0		3.0	
CO2	3.0	3.0	3.0	2.00								3.0	CO2	3.0	3.0	2.00	
CO3	3.0	3.0	3.0	3.0						2.00		3.0	CO3	3.0	2.00	2.00	
CO4	3.0	3.0	3.0	2.00								3.0	CO4	3.0	3.0	3.0	
CO5	3.0	3.0	3.0	3.0		3.0						3.0	CO5	3.0	3.0	3.0	
Avg	3.0	2.80	3.0	2.40		3.0				2.00		3.0	Avg	3.0	2.75	2.60	

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HUT 200	Professional Ethics	3	Ann Rija Paul Uma E S
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CO1	Understand the core values that shape the ethical behavior of a professional.
CO2	Adopt a good character and follow an ethical life.
CO3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.
CO4	Solve moral and ethical problems through exploration and assessment by established experiments.
CO5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.

CO -PO-PSO mapping table

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	CO/ PSO	PSO 1	PSO 2	PSO 3
CO1						3.0		2.00			2.00	2.00	CO1			
CO2						3.0		3.0			3.0	3.0	CO2			
CO3						3.0		3.0			3.0	3.0	CO3			
CO4						3.0		3.0			3.0	3.0	CO4			
CO5						3.0		3.0			3.0	3.0	CO5			
Avg						3.0		2.80			2.80	2.80	Avg			

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MCN201	Sustainable Engineering	3	Anusree.K Megha K. K
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CO1	Understand the relevance and the concept of sustainability and the global initiatives in this direction
CO2	Explain the different types of environmental pollution problems and their sustainable solutions
CO3	Discuss the environmental regulations and standards
CO4	Outline the concepts related to conventional and non-conventional energy
CO5	Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles

CO -PO-PSO mapping table

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	CO/ PSO	PSO 1	PSO 2	PSO 3
CO1						2.00	3.0					2.00	CO1		3.0	3.0
CO2		2.00				2.00	3.0	2.00				2.00	CO2			
CO3						2.00	3.0					2.00	CO3			
CO4						2.00	3.0					2.00	CO4			
CO5						2.00	3.0	2.00	3.0	3.0	2.00	2.00	CO5		2.00	2.00
Avg		2.00				2.00	3.0	2.00	3.0	3.0	2.00	2.00	Avg		2.50	2.50

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CSL201	Data Structures lab	3	Anusree.K Livya George Priya K V Ann Rija Paul Princy T. D.
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CO1	Write a time/space efficient program using arrays/linked lists/trees/graphs to provide necessary functionalities meeting a given set of user requirements (Cognitive Knowledge Level: Apply)
CO2	Write a time/space efficient program to sort a list of records based on a given key in the record (Cognitive Knowledge Level: Apply)
CO3	Write a time/space efficient program to convert an arithmetic expression from one notation to another (Cognitive Knowledge Level: Evaluate and Apply)
CO4	Write a program using linked lists to simulate Memory Allocation and Garbage Collection (Cognitive Knowledge Level: Apply)

CO -PO-PSO mapping table																		
CO/ PO	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12			PSO 1	PSO 2	PSO 3	
CO1	3	2	3	2					3			3			CO1	3		
CO2	3		3	2					3			3			CO2	3		
CO3	3	2	3	2					3			3			CO3	3		
CO4	3	2	3	2					3			3			CO4	3		
Avg	3	2	3	2					3			3			Avg	3		

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Department of Computer Science and Engineering

CSL203	Object oriented programming lab (in Java)	3	Dr. R. Satheesh Kumar SCARIA ALEX Uma E S Megha K. K
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CO1	Implement the Object Oriented concepts in java.
CO2	Construct programs in Java which use data types, operators, control statements, built in packages & interfaces, Input/Output streams and Files
CO3	Develop robust application programs in Java using exception handling , multithreading and database connectivity.
CO4	Implement Graphical User Interface based application programs by utilizing event handling features and Swing in Java.

CO -PO-PSO mapping table																
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	CO/ PS O	PSO1	PSO2	PSO3
CO1	3.0	3.0	3.0	3.0				2.00	2.00			3.0	CO 1	3.0		3.0
CO2	3.0	3.0	3.0	3.0				2.00	2.00			3.0	CO 2	3.0	2.00	3.0
CO3	3.0	3.0	3.0	3.0				2.00	2.00	2.00		3.0	CO 3	3.0	2.00	3.0
CO4	3.0	3.0	3.0	3.0				2.00	2.00			3.0	CO 4	3.0	2.00	3.0
CO5	3.0	3.0	3.0	3.0		3.0		2.00	2.00			3.0	CO 5	3.0	2.00	3.0
Avg	3.0	3.0	3.0	3.0		3.0		2.00	2.00	2.00		3.0	Avg	3.0	2.00	3.0

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S4 CSE

MAT206	Graph Theory	4	Rani Thomas Lickny I
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CO1	Demonstrate the fundamental concepts and theorems in Graph Theory
CO2	Apply the properties of graphs and trees in real life situations
CO3	Create efficient graph-theoretic algorithms used in mathematical modeling and engineering
CO4	Analyse various matrix representations and vertex colour problems in graphs

CO -PO-PSO mapping table

CO/ PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12		PSO1	PSO2	PSO3
CO1	3.0	3.0	2.0		2.0							2.0	CO1	2.00		
CO2	3.0	3.0	3.0		3.0							2.0	CO2	3.0		
CO3	3.0	3.0			3.0		2.0					2.0	CO3	3.0		
CO4	3.0	3.0	2.0		3.0		2.0						CO4	3.0		
Avg	3.0	3.0	2.33		2.75		2.00					2.00	Avg	2.75		

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CST202	Computer Organisation and Architecture	4	Ms Jasmy Davies, Dr Krishnadas J
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CO1	Recognize and express the relevance of basic components, I/O organization and pipelining schemes in a digital computer.
CO2	Explain the types of memory systems and mapping functions used in memory systems.
CO3	Demonstrate the control signals required for the execution of a given instruction
CO4	Design of Arithmetic Logic Unit and Control Unit.

CO -PO-PSO mapping table

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2		PSO1	PSO2	PSO3
CO1	3.0	3.0	3.0							2.0		3.0	CO1	3.0	3.0	
CO2	3.0	3.0	3.0	2.0						2.0		3.0	CO2	3.0	3.0	3.0
CO3	3.0	3.0	2.0							2.0		3.0	CO3	3.0	2.0	2.0
CO4	3.0	3.0	3.0	2.0						2.0		3.0	CO4	3.0	3.0	2.0
CO5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	CO5			
Avg	2.6	2.6	2.4	1.67	1.0	1.0	1.0	1.0	1.0	1.8	1.0	2.6	Avg	3.0	2.75	2.33

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CST204	Database Management Systems	4	Dr. R. Sunder Priya K V
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CO1	Define the fundamental concepts of databases and apply Entity-Relationship (E-R) model in real-time applications
CO2	Formulate the relational database principles using SQL queries and relational algebra.
CO3	Apply normalization techniques to make an efficient relational database design.
CO4	Summarize the principles of data organization and concurrent transaction processing
CO5	Outline the latest trends in databases.

CO -PO-PSO mapping table

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	CO/P SO	PS O1	PS O2	PS O3
CO1	3	3	3	3								2	CO1	3	3	
CO2	3	3	3	3								2	CO2	3	3	3
CO3	3	3	3	3								2	CO3	3	2	2
CO4	3	2	3	2								2	CO4	3	3	2
CO5	3	3			3							2	CO5	3	3	2
Avg	3	2.8	3	2.75	3							2	Avg	3	2.8	2.2 5

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CST206	Operating Systems	4	Anusree.K Dr.M.Rajeswari Shyam Krishna K
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CO1	Differentiate various operating systems by their functionality and apply process management with interprocess communication.
CO2	Analyse various process synchronization mechanisms and deadlock handling techniques to allocate resources effectively.
CO3	Analyse various memory management algorithms in operating systems.
CO4	Analyse file and storage management methods.

CO -PO-PSO mapping table

CO/ PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12		PSO1	PSO2	PSO3
CO1	3.0	3.0	3.0							2.00		3.0	CO1	3.0	3.0	
CO2	3.0	3.0	3.0	2.00						2.00		3.0	CO2	3.0	3.0	3.0
CO3	3.0	3.0	2.00							2.00		3.0	CO3	3.0	2.00	2.00
CO4	3.0	3.0	3.0	2.00						2.00		3.0	CO4	3.0	3.0	2.00
Avg	3.0	3.0	2.75	2.00						2.00		3.0	Avg	3.0	2.75	2.33

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EST200	Design and Engineering	2	Ann Rija Paul Uma E S
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CO1	Explain the different concepts and principles involved in design engineering.
CO2	Apply design thinking while learning and practicing engineering.
CO3	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.

CO -PO-PSO mapping table																	
CO/ PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12		CO /PS O	PS O1	PS O2	PS O3
CO1	3	2					2			3		3		CO 1			
CO2		2				2		2		3		3		CO 2			
CO3			3			2	3		3	3		3		CO 3			3
Avg	3	2	3			2	2.5	2	3	3		3		Avg			3

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MCN202	Constitution of India	2	Jasmy Davies SCARIA ALEX Ann Rija Paul
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CO1	Understand the background of our constitution and show national and patriotic spirit as responsible citizens of the country.
CO2	Utilize the fundamental rights and duties
CO3	Understand the working of state and central legislature, executive and judiciary

CO -PO-PSO mapping table																
CO/ PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12		PSO1	PSO2	PSO3
CO1	3.0		2.00		1.00	2.00	1.00	2.00	2.00	1.00			CO1			
CO2		1.00	2.00			3.0	1.00	2.00					CO2			
CO3	1.00				1.00			2.00	2.00	2.00	1.00	2.00	CO3			
CO4				1.00				1.00					CO4			
Avg	2.00	1.00	2.00	1.00	1.00	2.50	1.00	1.75	2.00	1.50	1.00	2.00	Avg			

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CSL202	Digital Lab	3	Dr. Arun Thomas Jasmy Davies Binet Rose Devassy Ann Rija Paul Priya K V Santhosh Kumar M S Saran K.B
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CO1	Design and implement combinational logic circuits using Logic Gates
CO2	Design and implement sequential logic circuits using Integrated Circuits
CO3	Simulate functioning of digital circuits using programs written in a Hardware Description Language
CO4	Function effectively as an individual and in a team to accomplish a given task of designing and implementing digital circuits

CO -PO-PSO mapping table																	
CO/ PO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO 12		CO/P SO	PS O1	PS O2	PS O3
CO1		2.00							3.0	3.0		2.0 0		CO1		2.0 0	
CO2		3.0							3.0	3.0		3.0		CO2		2.0 0	
CO3		3.0							3.0	3.0		3.0		CO3		2.0 0	
CO4		3.0			3.0				3.0	3.0		3.0		CO4		2.0 0	
Avg		2.75			3.0				3.0	3.0		2.7 5		Avg		2.0 0	

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CSL204	Operating Systems Lab	3	Roshni R Menon Anusree.K Dr. Krishnadas J Shyam Krishna K
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CO1	Illustrate the use of systems calls in Operating Systems.
CO2	Implement Inter Process Communication and process synchronization mechanisms in Operating Systems
CO3	Create modules to apply CPU Scheduling Algorithms(Round Robin, SJF, FCFS, Priority based) and Page Replacement Algorithms (FIFO, LRU, LFU).
CO4	Implement memory allocation methods (First Fit, Worst Fit, Best Fit), Deadlock handling techniques and Disk Scheduling (FCFS, SCAN, C-SCAN) in Operating Systems.

CO -PO-PSO mapping table																	
CO/ PO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO1 1	PO 12		CO /PS O	PS O1	PS O2	PS O3
CO1	3.0	2.00	2.0 0							2.0 0		2.0 0		CO 1	2.0 0		
CO2	3.0	3.0	3.0					2.0 0		2.0 0		3.0		CO 2	3.0	3.0	3.0
CO3	3.0	3.0	3.0	3.0				2.0 0		2.0 0		3.0		CO 3	3.0	3.0	3.0
CO4	3.0	3.0	3.0	3.0				2.0 0		2.0 0		3.0		CO 4	3.0	3.0	3.0
Avg	3.0	2.75	2.7 5	3.0				2.0 0		2.0 0		2.7 5		Avg	2.7 5	3.0	3.0

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

S5 CSE

CS301	Theory of Computation	3	Divya R
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CO1	Students will be able to define the mathematical principles behind theory of computation.
CO2	Students will be able to distinguish different types of automata like Finite Automata, Push down Automata, Linear Bounded Automata and Turing Machine.
CO3	Students will be able to correlate different types of automata to solve real world applications.
CO4	Students will be able to identify the different computational problems and their associated complexity.

CO -PO mapping table															
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2	3	3	3				2			2	2	2	2	
CO2	2	3	3	3				2			2	2	3	2	
CO3	2	2	2	3			2	2			2	2	2		
CO4	2	2	2	3				2			2	2	3		
Avg	2	2.5	2.5	3			2	2			2		2.67	2	

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CS303	System Software	3	Ms.Linnet Tomy, Ms.Uma
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CO1	Classify various system software features
CO2	Illustrate the working of one pass,two pass and multi pass assembler
CO3	Illustrate the working of existing system software's (Linker,loader and macro processor)
CO4	Compare the features of modern editing and debugging tools

CO -PO mapping table															
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	2	2	2									3		3
CO2	3	3	2	2									3	3	2
CO3	3	3	2	2		2						2	3	2	2
CO4	3	2	2	2	2								3	3	3
Avg	3	2.5	2	2	2	2						2	3	2.6	3.3

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CS305	Microprocessors and Microcontrollers	3	Krishnadas J
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CO1	Describe different modes of operations of a typical microprocessor and microcontroller.
CO2	Design and develop 8086 assembly language programs using software interrupts and various assembler directives.
CO3	Interface microprocessors with various external devices.
CO4	Analyze and compare the features of microprocessors and microcontrollers.

CO -PO mapping table															
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1			2	2			2							2	
CO2	2	2	2	3	2		2						3	2	2
CO3	3	3	3	3	2								3	3	2
CO4	3	3	2	2	2		2	2					3	3	2
Avg	2.67	2.67	2.25	2.5	2		2	2					3	2.5	2

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CS307	Data Communication	3	Deepa Devassy
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CO1	Identify and list various issues present in the design of a data communication system.
CO2	Apply the time domain and frequency domain concepts of signals in data communication
CO3	Compare and select transmission media based on transmission impairments and channel capacity.
CO4	Select and use appropriate signal encoding techniques and multiplexing techniques for a given scenario.
CO5	Design suitable error detection and error correction algorithms to achieve error free data communication and explain different switching techniques.

CO -PO mapping table															
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3										2		2
CO2	3	3		2								3			2
CO3	3	3	2	3								3			2
CO4	3	3	3									3	2		2
Avg	3	3	2.67	2.5								3	2		2

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS309	Graph Theory and COmbinatorics	3	Sreetha E S
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CO1	Demonstrate the fundamental concepts in graph theory, properties and types of graphs and trees
CO2	Apply the knowledge of graphs and trees to solve the real life problems
CO3	Apply the knowledge of advanced graph properties like edge and vertex connectivity to solve real life problems using efficient algorithms.
CO4	Describe various matrix representations of graph and its properties

CO -PO mapping table																
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2		PSO 1	PSO 2	PSO 3
CO1	3	3	3	3								3	CO1	3	3	
CO2	3	3	3	3		2		2				2	CO2	3	3	
CO3	3	3	3	3		2		2				2	CO3	2	2	
CO4	3	3	3	3								3	CO4	3	3	
Avg	3	3	3	3		2		2				2.5	Avg	2.75	2.75	

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS361	Soft Computing	3	Dr. R. Sunder Sheethal M S
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CO1	Understand the fundamental principles and list out various neural network training strategies.
CO2	Summarize the different learning methods and use in artificial intelligence
CO3	Design Different fuzzification and defuzzification methods using fuzzy Systems
CO4	Apply genetic algorithm concepts in neural network and fuzzy system.

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2								3		3
CO2	3	2	3	2								3	3	2
CO3	3		2	1	1							3	2	2
CO4	2	3	2	3	2							3	2	2
Avg	2.75	2.33	2.5	2	1.5							3	2.33	2.25

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS341	Design Project	2	Jasmy Davies Sheethal M S Princy T. D. Roshni R Menon Shyam Krishna K/ Uma E S
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CO1	Choose and think innovatively on the development of emerging components, products, processes or technologies in the field of computer science
CO2	Analyse the problem requirements and arrive at workable design solutions
CO3	Design a prototype with respect to the current technologies
CO4	Develop and design products which meets the needs of the society

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3					3	3	3	3		3	3	3	3	3
CO2		3	3	3					3			3	2	3	3
CO3					3				3			3	3	3	3
CO4		3	3	3	3	3	3		3		3	3	3	3	2
Avg	3	3	3	3	3	3	3	3	3		3	3	2.75	3	2.75

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Department of Computer Science and Engineering

CS331	System Software Lab	1	Linnet Tomy Shyam Krishna K Dr. R. Sunder Dr. Krishnadas J Roshni R Menon
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CO1	Compare and analyze CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority.
CO2	Implement basic memory management schemes like paging.
CO3	Implement synchronization techniques using semaphores etc.
CO4	Implement banker's algorithm for deadlock avoidance.
CO5	Implement memory management schemes and page replacement schemes and file allocation and organization techniques.
CO6	Implement system software such as loaders, assemblers and macro processor.

CO -PO-PSO mapping table															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1			1	2											
CO2			2	2									2		
CO3			2	2									3	3	2
CO4			3	2									3	3	2
Avg			2	2									2.67	3	2

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Department of Computer Science and Engineering

CS333	Application Development Lab	1	Ms. Livya George, Ms. Jasmy Davis
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CO1	Design and implement a database for a given problem using database design principles.
CO2	Apply stored programming concepts (PL-SQL) using Cursors and Triggers.
CO3	Use graphical user interface, Event Handling and Database connectivity to develop and deploy applications and applets.
CO4	Develop medium-sized project in a team.
CO5	Develop an aptitude towards database programming
CO6	Understand and apply the project creation techniques

CO -PO-PSO mapping table

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		3	3	1									2		
CO2	2		3		1										
CO3	2	1	3		1										
CO4		3	3	2	3	1	1	1	3	3	3	3			
CO5						2	1	3				3			
CO6	2					2		1	3		3	3			
Avg	2	2.33	3	1.5	1.67	1.67	1	1.67	3	3	3	3	2		

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

S6 CSE

CS302	DESIGN AND ANALYSIS OF ALGORITHMS	4	Priya K V Megha K. K
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CO1	Analyze a given algorithm and express its time and space complexities in asymptotic notations and to Solve recurrence equations using Iteration Method, Recurrence Tree Method and Master’s Theorem.
CO2	Apply the concepts of advanced data structures like tree and graph
CO3	Design efficient algorithms using different strategies such as Divide and Conquer, dynamic programming, greedy method, backtracking, branch and bound etc. for solving problems.
CO4	Classify computational problems into P, NP, NP-Hard and NP-Complete.

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	3							2	3	3	3	
CO2	2	2	3	3								3	3	3	
CO3	2	2	3	2								2	3	3	
CO4	2	2	2	2								2	3	3	3
Avg	2.25	2.25	2.5	2.5							2	2.5	3	3	3

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS304	COMPILER DESIGN	3	DIVYA R, SREETHA E S
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CO1	Understand the concepts and different phases of compilation with compile time error handling and represent language tokens using regular expressions, context free grammar and finite automata
CO2	Compare top down with bottom up parsers, and develop appropriate parser to produce parse tree representation of the input.
CO3	Implement intermediate code for statements and Design syntax directed translation schemes for a given context free grammar
CO4	Apply optimization techniques to intermediate code and generate machine code for high level language program

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	2	3	3	3									2	2	
CO2	2	3	3	3									3	2	
CO3	2	2	2	3									2		
CO4	2	2	2	3									3		
Avg	2	2.5	2.5	3									2.5	2	

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS306	Computer Networks	3	SCARIA ALEX Deepa Devassy
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CO1	Understand the different aspects of networks, protocols and network design models.
CO2	Examine various Data Link layer design issues, Data Link protocols and recent updates.
CO3	Select appropriate routing algorithms for a network functioning with different network layer protocols.
CO4	Summarize the important aspects and functions of transport layer and application layer in internetworking.

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	3	3	2								3	2	2	
CO2	3	3	2	2								3		2	
CO3	3	3	3	3								3		3	2
CO4	3	3	3	2								3		2	2
Avg	3	3	2.75	2.25								3	2	2.25	2

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS308	Software Engineering & Project Management	3	WILLSON JOSEPH C Dr. R. Satheesh Kumar
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CO1	Identify suitable life cycle models to be used.
CO2	Analyze a problem, identify and define the computing requirements to the problem.
CO3	Translate a requirement specification to Design using an appropriate software engineering methodology.
CO4	Develop software projects based on current technology, by managing resources economically and keeping ethical values.

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	3	3										3	3	3
CO2	3	3	3	3		2			2	2	2	2	3	3	
CO3	3	3	3	3						2			3	3	
CO4	3	3	3	3		3		3	2	3	3	3	3	3	3
Avg	3	3	3	3		2.5		3	2	2.33	2.5	2.5	3	3	3

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

HS300	Principle of Management	3	Roshni R Menon Princy T. D.
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CO1	Recall and identify the relevance of management concepts
CO2	Describe and relate management techniques adopted within an organization
CO3	Apply management techniques for meeting current and future management challenges faced by the organization
CO4	Compare the management theories and models critically and to inspect and question its validity in the real world

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1						3					3				
CO2						2		3	3		3	3		2	
CO3									2		3	3		2	
CO4						3		3	2		3	2			
Avg						2.67		3	2.33		3	2.67		2	

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS364	Mobile Computing	3	Shyam Krishna K
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CO1	Understand about various Mobile Computing applications, services and architecture.
CO2	Understand various technology trends for next generation cellular wireless networks.
CO3	Describe protocol architecture of Wireless LAN technology.
CO4	Understand security issues in mobile computing.

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2		2						2	3	2	3
CO2	3	3	3	2		2		2				2	2	2	3
CO3	3	3	2			2							3	3	2
CO4	3	2				2							2	2	2
CO5	3	2	2	2		2						2	3	2	2
CO6	2	2	2	2		3						2	3	2	2
Avg	2.83	2.5	2.4	2		2.17		2				2	2.67	2.17	2.33

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS368	Web Technology	3	Linnet Tomy
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CO1	Understand the components in Web Technology
CO2	Develop web pages using HTML, CSS, Javascript, JQuery
CO3	Know the different information interchange formats like XML and JSON
CO4	Design web sites using php

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2		3							3	3	3	2
CO2	3	3	3		3			3				3	3	3	3
CO3	3	3	3	3	3			3				3	3	3	3
CO4	3	3	3		3			3				3	3	3	3
Avg	3	3	2.75	3	3			3				3	3	3	2.75

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Department of Computer Science and Engineering

CS332	Microprocessor Lab	1	Uma E S Dr. Krishnadas J SCARIA ALEX
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CO1	To Practice assemble language programming on 8086
CO2	Implement interfacing of various I/O devices to the microprocessor/microcontroller through assembly language programming

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	3	3	3	2	2			2	1		1			
CO2	2	3	3	2	2	2			2	1		1	2		
Avg	2.5	3	3	2.5	2	2			2	1		1	2		

CS334	Network PProgramming Lab	1	Livya George Dr. R. Satheesh Kumar WILLSON JOSEPH C Deepa Devassy Princy T. D.
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CO1	Use Network related commands and configuration files in Linux Operating System.
CO2	Use tools for Network Traffic Analysis and Network Monitoring.
CO3	Develop Network Programming using Linux System Calls.
CO4	Design and deploy Computer Networks.

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CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1			3	3	3	3			3						3
CO2					3	3									3
CO3			3	3	3	3									3
CO4			3	3	3	3			3						3
Avg			3	3	3	3			3						3

CS352	Comprehensive Viva	1	Dr. R. Sunder SCARIA ALEX Ann Rija Paul SREETHA E S
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CO1	Assess the knowledge gained in basic core courses
CO2	Discuss the fundamental aspects of engineering problems/situations and give answers in dealing with them.
CO3	Facilitate students with deep knowledge which will help them to be good professionals.
CO4	Develop interpersonal skills through discussions.

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	3	2	2											
CO2			3	3									2		

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CO3						3	3	3			3	3	3	3	2
CO4									3	3			3	3	2
Avg	3	3	2.5	2.5		3	3	3	3	3	3	3	2.67	3	2

S7 CSE

CS401	Computer Graphics	4	Linnet Tomy Livya George
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CO1	Compare various graphics devices and visible surface detection methods
CO2	Apply the algorithms for line drawing, circle drawing, polygon filling and clipping
CO3	Apply various geometrical transformation and projection techniques
CO4	Interpret various concepts and basic operations of image processing

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	2	3	2		2							3	3	2
CO2	3	2	3	3		2						2	3	3	3
CO3	3	2	3	3		2						2	3		1
CO4	3		2	2	2	2						2	3	3	3
Avg	3	2	2.75	2.5	2	2						2	3	3	2.25

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Department of Computer Science and Engineering

CS403	Programming Paradigms	3	Shyam Krishna K Princy T. D.
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CO1	Compare the core programming constructs like scope, binding of names and outline various control flow structures in different programming languages
CO2	Analyse different data types in various programming languages
CO3	Analyse subroutines & control abstraction mechanisms of various programming languages
CO4	Compare and contrast object oriented constructs, concurrency constructs and run-time program management in different programming languages

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	3	2	2	2							2	2	3	3
CO2	3	3	2	2	2		1	2		2	2	3	2	3	3
CO3	3	3	2	2	2				2	2	3	3	3	3	3
CO4	3	3	2	2	2			3	2	2	2	2	3	3	3
Avg	3	3	2	2	2		1	2.5	2	2	2.33	2.5	2.5	3	3

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS405	Computer System Architecture	4	Livya george, Anusree k
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CO1	Summarize different parallel computer models
CO2	Analyze the advanced processor technologies
CO3	Interpret memory hierarchy
CO4	Compare different multiprocessor system interconnecting mechanisms and interpret the mechanisms for enforcing cache coherence
CO5	Analyze different message passing mechanisms and different pipe lining techniques
CO6	Appraise concepts of multi-threaded and data flow architectures

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO1	PSO2	PSO3
CO1	3.00	3.00											3.00	3.00	3.00
CO2			3.00	3.00									3.00	3.00	3.00
CO3			3.00	3.00									3.00	3.00	3.00
CO4			3.00	3.00									3.00	3.00	3.00
CO5			3.00	3.00									3.00	3.00	3.00
CO6			3.00	3.00									3.00	3.00	3.00
Avg	3.00	3.00	3.00	3.00									3.00	3.00	3.00

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
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CS407	Distributed Systems	3	WILLSON JOSEPH C
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CO1	Demonstrate knowledge of the basic elements and core architectural aspects of distributed systems
CO2	Apply appropriate distributed system principles in ensuring transparency, consistency and fault tolerance in distributed file systems.
CO3	Analyze different client server communication models and their practical applications
CO4	Compare the different process synchronization algorithms and its application in real time systems.

CO/ PO	PO 1	PO 2	PO 3	PO 4	PO 5	P O6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12			PS O1	PS O2	PS O3
CO1	3	3	3	2	3	3	3							CO 1	3	3	
CO2	3	3	3	3	3	3	3	3				3		CO 2	3	3	
CO3	3	3	3	2	2		3					3		CO 3	3	3	2
CO4	2	3	3	3	2		3					3		CO 4	3	3	2
Avg	2.7 5	3	3	2.5	2.5	3	3	3				3		Av g	3	3	2

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS409	Cryptography & Network Security	3	Ms. Roshni R Menon
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CO1	Analyze the different classical encryption techniques
CO2	Make use of the various mathematical concepts for different cryptographic algorithms
CO3	Apply Cryptographic algorithms for Encryption and Key-Exchange in real time projects.
CO4	Summarize different authentication and digital signature schemes
CO5	Identify the security issues in network, transport and application layers and outline appropriate security protocols

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	3	2			3						3	3	3	2
CO2	3	3	3	3		3						3	3	3	2
CO3	3	3	3			3		3				3	3	3	2
CO4	3	3	3			3		3				3	3	3	2
CO5	3	3	3			3		3				3	3	3	2
Avg	3	3	2.75	3		3		3				3	3	3	2

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Department of Computer Science and Engineering

CS463	Digital Image Processing	3	Jasmy Davies Sheethal M S
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CO1	compare different methods for image acquisition, storage and representation in digital devices and computers
CO2	Demonstrate role of image transforms in representing, highlighting, and modifying image features
CO3	Examine the mathematical principles in digital image enhancement and apply them in spatial domain and frequency domain
CO4	Examine the mathematical principles in image segmentation,Representation and description of images

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3		2	3									3	2	2
CO2	3	2	3	2									2	3	2
CO3	3	2	2	2									3	3	2
CO4	3	2	2	1									3	3	2
Avg	3	2	2.25	2									2.75	2.75	2

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS467	Machine Learning	3	Annrija paul
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CO1	Identify the basic Principles and Applications of Machine Learning in various real time problems such as dimensionality reduction
CO2	Illustrate the working of classifier models such as SVM, Neural networks and Identify classifier model for typical machine learning application
CO3	Apply different classification and clustering algorithms and identify its applicability in real life problems
CO4	Identify the state sequence and evaluate a sequence emission probability from given HMM

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1			2	1										
CO2			3	3								2		
CO3			3	3								3	3	2
CO4			3	3								3	3	2
Avg			2.75	2.5								2.67	3	2

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Department of Computer Science and Engineering

CS451	Seminar and Project Preliminary	2	Linnet Tomy WILLSON JOSEPH C Megha K. K Dr. Krishnadas J Sheethal M S
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CO1	Analyze a current topic of professional interest and present it before an audience
CO2	Identify an engineering problem, analyze it and propose a work plan to solve it.
CO3	Design a model with respect to recent technologies in the field of computer science.
CO4	Describe, compare and evaluate different technologies

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3					3	3	3	3		3	3	3	2	3	
CO2		3	3	3					3			3	3	3	3	
CO3					3				3			3	3	3	3	
CO4		3	3	3	3	3	3		3		3	3	2	3	3	
CO5									3	3	3	3		2		
Avg	3	3	3	3	3	3	3	3	3	3	3	3	2.75	2.75	3	

SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA
Department of Computer Science and Engineering

CS431	Compiler Design Lab	1	Divya R Jasmy Davies Deepa Devassy SREETHA E S
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CO1	Analyze a current topic of professional interest and present it before an audience
CO2	Identify an engineering problem, analyze it and propose a work plan to solve it.
CO3	Design a model with respect to recent technologies in the field of computer science.
CO4	Describe, compare and evaluate different technologies

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1		3	3	2	3			2	2			3	3		
CO2		3	3	3	3			2	2			3	3		2

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CO3	2	3	3	2				2	2			3	3	2	2
CO4		3	3	2				2	2			3	3	2	2
Avg	2	3	3	2.25	3			2	2			3	3	2	2

S8 CSE

CS402	Data Mining and Warehousing	3	Annrija Paul, Uma E S
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CO1	Identify the key process of Data mining and Warehousing and apply appropriate techniques to convert raw data into suitable format for practical data mining tasks
CO2	Evaluate various classification algorithms using performance matrices
CO3	Analyze the different categories of clustering algorithms and its applications
CO4	Apply association rule mining in real world scenario to extend data mining methods to the new domains like web mining.

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	2		2	3	2						3	3	3	3	1
CO2	2		3	2	2						3	3	3	2	2
CO3	2		3	2	2						3	3	3		1
CO4	2		2	2	2						3	3	2	3	
Avg	2		2.5	2.25	2						3	3	2.75	2.67	1.33

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CS404	Embedded Systems	3	Shyam Krishna K Dr. Arun Thomas
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CO1	Understand the process and concepts of embedded system and discuss various software components involved in embedded system design and development.
CO2	Model the operation of a given embedded system and to design simple tasks to run on an RTOS
CO3	Design embedded products and firmware using firmware languages
CO4	Demonstrate various embedded hardware and firmware using SDE's and to understand various embedded system networks and its latest trends.

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1							3					2			
CO2	3	3	3	3	3	3		3				2	3		
CO3	3	3	3	3	2	3						2	3		
CO4	3	2	3	3	3	3						2	3	3	3
Avg	3	2.67	3	3	2.67	3	3	3				2	3	3	3

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CS 472	Principles of Information Security	3	Roshni R Menon Jasmy Davies
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CO1	Appreciate the common threats faced today & Interpret the foundational theory behind information security
CO2	Design a secure system & Identify the potential vulnerabilities in software
CO3	Appreciate the relevance of security in various domains
CO4	Develop secure web services and perform secure e-transactions

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	2	2	2		3		3				2	3	3	1
CO2	3	2	2	2		3		3				2	3	2	2
CO3	3	2	3			2		3				2	3		1
CO4	3	2	3			2		3				2	2	3	
CO5	3	2	2					3				2	3	2	2
CO6	3	2	3	3				3				2	3	2	2
Avg	3	2	2.5	2.33		2.5		3				2	2.83	2.4	1.6

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CS492	Project	12	Linnet Tomy WILLSON JOSEPH C Divya R Megha K. K
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CO1	Develop innovative components, products, processes or technologies in the engineering field.
CO2	Apply knowledge gained in solving real life engineering problems
CO3	Evaluate the work and present the results in front of an audience
CO4	Learn to work as a team and to develop a working project done on time with each student being held accountable for their part of the project.

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	3	3	3									3	3	3
CO2	3		3			3	3		3		3	3	3	3	3
CO3			3		3								3	3	3
CO4								3	3	3		3		2	
CO5						3	3	3	3	3	3	3		3	3

