



SUDHARSAN ENGINEERING COLLEGE

(Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)

Sathiyamangalam, Kulathur(TK), Pudukkottai District-622 501

Ph: 04339-240830, 240840 Fax: 04339-240205

Website: www.sec.ac.in Email: principal@sec.ac.in



DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

PROGRAMME: B.TECH ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

COURSE OUTCOMES (COs)

Semester	01
Subject Code	HS3152
Subject Name	PROFESSIONAL ENGLISH I
Course Outcome	<ul style="list-style-type: none">• To use appropriate words in a professional context• To gain understanding of basic grammatic structures and use them in right context.• To read and infer the denotative and connotative meanings of technical texts• To write definitions, descriptions, narrations and essays on various topics

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	1	1	1	1	3	3	3	1	3	-	3	-	-	-
2	1	1	1	1	1	3	3	3	1	3	-	3	-	-	-
3	2	3	2	3	2	3	3	3	2	3	3	3	-	-	-
4	2	3	2	3	2	3	3	3	2	3	3	3	-	-	-
5	2	3	3	3	-	3	3	3	2	3	-	3	-	-	-
AVg.	1.6	2.2	1.8	2.2	1.5	3	3	3	1.6	3	3	3	-	-	-

1 - low, 2 - medium, 3 - high, '-' - no correlation



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Semester	01
Subject Code	MA3151
Subject Name	MATRICES AND CALCULUS
Course Outcome	<ul style="list-style-type: none">• Use the matrix algebra methods for solving practical problems.• Apply differential calculus tools in solving various application problems.• Able to use differential calculus ideas on several variable functions.• Apply different methods of integration in solving practical problems.• Apply multiple integral ideas in solving areas, volumes and other practical problems.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO2	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO3	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO4	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
CO5	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-
Avg	3	3	1	1	0	0	0	0	2	0	2	3	-	-	-



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Semester	01
Subject Code	PH3151
Subject Name	ENGINEERING PHYSICS
Course Outcome	<ul style="list-style-type: none">• Understand the importance of mechanics.• Express their knowledge in electromagnetic waves.• Demonstrate a strong foundational knowledge in oscillations, optics and lasers.• Understand the importance of quantum physics.• Comprehend and apply quantum mechanical principles towards the formation of energy bands.

CO	PO	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	2	1	1	1	-	-	-	-	-	-	-	-	-
2	3	3	2	1	2	1	-	-	-	-	-	-	-	-	-
3	3	3	2	2	2	1	-	-	-	-	-	1	-	-	-
4	3	3	1	1	2	1	-	-	-	-	-	-	-	-	-
5	3	3	1	1	2	1	-	-	-	-	-	-	-	-	-
AV	3	3	1.6	1.2	1.8	1	-	-	-	-	-	1	-	-	-



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Sem	01
Subject Code	CY3151
Subject Name	ENGINEERING CHEMISTRY
Course Outcome	<ul style="list-style-type: none">• To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.• To identify and apply basic concepts of Nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.• To apply the knowledge of phase rule and composites for material selection requirements.• To recommend suitable fuels for engineering processes and applications.• To recognize different forms of energy resources and apply them for suitable applications in energy sectors

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	1	-	1	1	-	-	-	-	1	-	-	-
2	2	-	-	1	-	2	2	-	-	-	-	-	-	-	-
3	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	1	1	-	-	1	2	-	-	-	-	-	-	-	-
5	3	1	2	1	-	2	2	-	-	-	-	2	-	-	-
CO	2.8	1.3	1.6	1	-	1.5	1.8	-	-	-	-	1.5	-	-	-



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Sem	01
Subject Code	GE3151
Subject Name	PROBLEM SOLVING AND PYTHON PROGRAMMING
Course Outcome	<ul style="list-style-type: none">• Develop algorithmic solutions to simple computational problems.• Develop and execute simple Python programs.• Write simple Python programs using conditionals and loops for solving problems.• Decompose a Python program into functions.• Represent compound data using Python lists, tuples, dictionaries etc.• Read and write data from/to files in Python programs.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	3	2	-	-	-	-	-	2	2	3	3	-
2	3	3	3	3	2	-	-	-	-	-	2	2	3	-	-
3	3	3	3	3	2	-	-	-	-	-	2	-	3	-	-
4	2	2	-	2	2	-	-	-	-	-	1	-	3	-	-
5	1	2	-	-	1	-	-	-	-	-	1	-	2	-	-
6	2	2	-	-	2	-	-	-	-	-	1	-	2	-	-
AVg.	2	3	3	3	2	-	-	-	-	-	2	2	3	3	-



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Sem	01
Subject Code	GE3171
Subject Name	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY
Course Outcome	<ul style="list-style-type: none">• Develop algorithmic solutions to simple computational problems• Develop and execute simple Python programs.• Implement programs in Python using conditionals and loops for solving problems..• Deploy functions to decompose a Python program.• Process compound data using Python data structures.• Utilize Python packages in developing software applications.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	3	2	-	-	-	-	-	2	2	3	3	-
2	3	3	3	3	2	-	-	-	-	-	2	2	3	-	-
3	3	3	3	3	2	-	-	-	-	-	2	-	3	-	-
4	2	2	-	2	2	-	-	-	-	-	1	-	3	-	-
5	1	2	-	-	1	-	-	-	-	-	1	-	2	-	-
6	2	2	-	-	2	-	-	-	-	-	1	-	2	-	-
AVg.	2	3	3	3	2	-	-	-	-	-	2	2	3	3	-



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Sem	01
Subject Code	BS3171
Subject Name	CHEMISTRY LABORATORY
Course Outcome	<ul style="list-style-type: none">• To analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.• To determine the amount of metal ions through volumetric and spectroscopic techniques• To analyse and determine the composition of alloys.• To learn simple method of synthesis of nanoparticles• To quantitatively analyse the impurities in solution by electroanalytical techniques

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	-	1	-	-	2	2	-	-	-	-	2	-	-	-
2	3	1	2	-	-	1	2	-	-	-	-	1	-	-	-
3	3	2	1	1	-	-	1	-	-	-	-	-	-	-	-
4	2	1	2	-	-	2	2	-	-	-	-	-	-	-	-
5	2	1	2	-	1	2	2	-	-	-	-	1	-	-	-
Avg.	2.6	1.3	1.6	1	1	1.4	1.8	-	-	-	-	1.3	-	-	-



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Sem	02
Subject Code	GE3172
Subject Name	ENGLISH LABORATORY
Course Outcome	<ul style="list-style-type: none">• To listen to and comprehend general as well as complex academic information• To listen to and understand different points of view in a discussion• To speak fluently and accurately in formal and informal communicative contexts• To describe products and processes and explain their uses and purposes clearly and accurately• To express their opinions effectively in both formal and informal discussions

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



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Sem	02
Subject Code	HS3252
Subject Name	PROFESSIONAL ENGLISH - II
Course Outcome	<ul style="list-style-type: none">• To compare and contrast products and ideas in technical texts.• To identify and report cause and effects in events, industrial processes through technical texts• To analyse problems in order to arrive at feasible solutions and communicate them in the written format.• To present their ideas and opinions in a planned and logical manner• To draft effective resumes in the context of job search.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
2	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
3	3	3	3	3	3	3	3	3	2	3	3	3	-	-	-
4	3	3	3	3	2	3	3	3	2	3	3	3	-	-	-
5	-	-	-	-	-	-	-	-	3	3	3	3	-	-	-
AVg.	3	3	3	3	2.75	3	3	3	2.2	3	3	3	-	-	-



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Sem	02
Subject Code	MA3251
Subject Name	STATISTICS AND NUMERICAL METHODS
Course Outcome	<ul style="list-style-type: none">• Apply the concept of testing of hypothesis for small and large samples in real life problems.• Apply the basic concepts of classifications of design of experiments in the field of agriculture.• Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.• Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.• Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
CO2	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
CO3	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
CO4	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
CO5	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
Avg	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-



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Sem	02
Subject Code	PH3256
Subject Name	PHYSICS FOR INFORMATION SCIENCE
Course Outcome	<ul style="list-style-type: none"> • Gain knowledge on classical and quantum electrontheories, and energy band structures • Acquire knowledge on basics of semiconductor physicsand its applications in various devices • Get knowledge on magnetic properties of materials andtheir applications in data storage, • Have the necessary understanding on the functioning ofoptical materials for optoelectronics • Understand the basics of quantum structures and their applications and basics of quantum computing

CO's	PO's												PSO's			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	3	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	3	-	-	1	2	1	1	-	-	-	-	-	-	-	-	-
4	3	-	2	1	3	-	1	-	-	-	-	-	-	-	-	-
5	3	2	2	2	2	1	2	-	-	-	-	2	-	-	-	-
AVG	3	1.3	2	1.3	2.3	1	1.3	-	-	-	-	2	-	-	-	-



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Sem	02
Subject Code	BE3251
Subject Name	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
Course Outcome	<ul style="list-style-type: none">• Compute the electric circuit parameters for simple problems• Explain the working principle and applications of electrical machines• Analyze the characteristics of analog electronic devices• Explain the basic concepts of digital electronics• Explain the operating principles of measuring instruments

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	2	1	-	-	-	-	1	-	-	-	2	-	-	1
2	2	2	1	-	-	-	-	1	-	-	-	2	-	-	1
3	2	1	1	-	-	-	-	1	-	-	-	2	-	-	1
4	2	2	1	-	-	-	-	1	-	-	-	2	-	-	1
5	2	2	1	-	-	-	-	1	-	-	-	2	-	-	1
CO	2	1.8	1	-	-	-	-	1	-	-	-	2	-	-	1



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Sem	02
Subject Code	GE3251
Subject Name	ENGINEERING GRAPHICS
Course Outcome	<ul style="list-style-type: none">• Use BIS conventions and specifications for engineering drawing. Construct the conic curves, involutes and cycloid.• Solve practical problems involving projection of lines.• Draw the orthographic, isometric and perspective projections of simple solids.• Draw the development of simple solids

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



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Sem	02
Subject Code	AD3251
Subject Name	DATA STRUCTURES DESIGN
Course Outcome	<ul style="list-style-type: none">• Explain abstract data types• Design, implement, and analyse linear data structures, such as lists, queues, and stacks, according to the needs of different applications• Design, implement, and analyse efficient tree structures to meet requirements such as searching, indexing, and sorting• Model problems as graph problems and implement efficient graph algorithms to solve them



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Sem	02
Subject Code	GE3271
Subject Name	ENGINEERING PRACTICES LABORATORY
Course Outcome	<ul style="list-style-type: none">• Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.• Wire various electrical joints in common household electrical wire work.• Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.• Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.

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



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Sem	02
Subject Code	AD3271
Subject Name	DATA STRUCTURES DESIGN LABORATORY
Course Outcome	<ul style="list-style-type: none">• Implement ADTs as Python classes• Design, implement, and analyse linear data structures, such as lists, queues, and stacks, according to the needs of different applications• Design, implement, and analyse efficient tree structures to meet requirements such as searching, indexing, and sorting• Model problems as graph problems and implement efficient graph algorithms to solve them



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Sem	02
Sub Code	GE3272
Sub Name	COMMUNICATION LABORATORY
Course Outcome	<ul style="list-style-type: none"> • Speak effectively in group discussions held in a formal/semi formal contexts. • Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions • Write emails, letters and effective job applications. • Write critical reports to convey data and information with clarity and precision • Give appropriate instructions and recommendations for safe execution of tasks

CO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO1	PO1	PO1	PSO	PSO	PSO
1	2	3	3	3	1	3	3	3	3	3	3	3	-	-	-
2	2	3	3	3	1	3	3	3	3	3	3	3	-	-	-
3	2	2	3	3	1	3	3	3	3	3	3	3	-	-	-
4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-
5	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-
AV	2.4	2.8	3	3	1.8	3	3	3	3	3	3	3	-	-	-



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Sem	03
Sub Code	MA3354
Sub Name	DISCRETE MATHEMATICS
Course Outcome	<ul style="list-style-type: none">• Have knowledge of the concepts needed to test the logic of a program.• Have an understanding in identifying structures on many levels.• Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.• Be aware of the counting principles.• Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.

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



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Sem	03
Sub Code	CS3351
Sub Name	DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION
Course Outcome	<ul style="list-style-type: none">• Design various combinational digital circuits using logic gates• Design sequential circuits and analyze the design procedures• State the fundamentals of computer systems and analyze the execution of an instruction• Analyze different types of control design and identify hazards• Identify the characteristics of various memory systems and I/O communication

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	3	3	3	3	2	1	1	1	1	2	3	2	3	3
2	3	3	3	3	2	1	1	1	1	1	2	3	1	2	2
3	3	3	3	3	2	2	1	1	1	1	2	3	2	3	1
4	3	3	3	3	1	1	1	1	1	1	1	2	1	3	1
5	3	3	3	3	1	2	1	1	1	1	1	2	1	2	1
AVG	3	3	3	3	1	2	1	1	1	1	1	2	1	2	1



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Sem	03
Sub Code	AD3391
Sub Name	DATABASE DESIGN AND MANAGEMENT
Course Outcome	<ul style="list-style-type: none">• Understand the database development life cycle and apply conceptual modeling• Apply SQL and programming in SQL to create, manipulate and query the database• Apply the conceptual-to-relational mapping and normalization to design relational database• Determine the serializability of any non-serial schedule using concurrency techniques• Apply the data model and querying in Object-relational and No-SQL databases.

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



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Sem	03
Sub Code	AD3351
Sub Name	DESIGN AND ANALYSIS OF ALGORITHMS
Course Outcome	<ul style="list-style-type: none"> Analyze the efficiency of recursive and non-recursive algorithms mathematically Analyze the efficiency of brute force, divide and conquer, decrease and conquer, Transform and conquer algorithmic techniques Implement and analyze the problems using dynamic programming and greedy algorithmic techniques. Solve the problems using iterative improvement techniques for optimization. Compute the limitations of algorithmic power and solve the problems using backtracking and branch and bound techniques.

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



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Sem	03
Sub Code	AD3301
Sub Name	DATA EXPLORATION AND VISUALIZATION
Course Outcome	<ul style="list-style-type: none">• Understand the fundamentals of exploratory data analysis.• Implement the data visualization using Matplotlib.• Perform univariate data exploration and analysis.• Apply bivariate data exploration and analysis.• Use Data exploration and visualization techniques for multivariate and time series data.

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



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Sem	03
Sub Code	AL3391
Sub Name	ARTIFICIAL INTELLIGENCE
Course Outcome	<ul style="list-style-type: none">• Explain intelligent agent frameworks• Apply problem solving techniques• Apply game playing and CSP techniques• Perform logical reasoning• Perform probabilistic reasoning under uncertainty

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



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Sem	03
Sub Code	AD3381
Sub Name	DATABASE DESIGN AND MANAGEMENT LABORATORY
Course Outcome	<ul style="list-style-type: none"> • Understand the database development life cycle • Design relational database using conceptual-to-relational mapping, Normalization • Apply SQL for creation, manipulation and retrieval of data • Develop a database applications for real-time problems • Design and query object-relational databases

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



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Sem	03
Sub Code	AD3311
Sub Name	ARTIFICIAL INTELLIGENCE LABORATORY
Course Outcome	<ul style="list-style-type: none">• Design and implement search strategies• Implement game playing and CSP techniques• Develop logical reasoning systems• Develop probabilistic reasoning systems

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



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Sem	03
Sub Code	GE3361
Sub Name	PROFESSIONAL DEVELOPMENT
Course Outcome	<ul style="list-style-type: none">• Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements• Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding• Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects



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Sem	04
Sub Code	MA3391
Sub Name	PROBABILITY AND STATISTICS
Course Outcome	<ul style="list-style-type: none"> • Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon. • Understand the basic concepts of one and two dimensional random variables and apply in engineering applications. • Apply the concept of testing of hypothesis for small and large samples in real life problems. • Apply the basic concepts of classifications of design of experiments in the field of agriculture and statistical quality control. • Have the notion of sampling distributions and statistical techniques used in engineering and management problems.

	PO 01	PO 02	PO0 3	PO0 4	PO0 5	PO0 6	PO0 7	PO0 8	PO0 9	PO1 0	PO1 1	PO1 2	PS O1	PS O2	PS O3
CO1	3	3	0	0	0	0	0	0	2	0	0	2			
CO2	3	3	0	0	0	0	0	0	2	0	0	2			
CO3	3	3	0	0	0	0	0	0	2	0	0	2			
CO4	3	3	3	2	0	0	0	0	2	0	0	2			
CO5	3	3	2	2	0	0	0	0	2	0	0	2			
AVG	3	3	1	1	0	0	0	0	2	0	0	2			



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Sem	04
Sub Code	AL3452
Sub Name	OPERATING SYSTEMS
Course Outcome	<ul style="list-style-type: none">Analyze various scheduling algorithms and process synchronization.Explain deadlock, prevention and avoidance algorithms.Compare and contrast various memory management schemes.Explain the functionality of file systems I/O systems, and VirtualizationCompare iOS and Android Operating Systems.

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



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Sem	04
Sub Code	AL3451
Sub Name	MACHINE LEARNING
Course Outcome	<ul style="list-style-type: none">• Explain the basic concepts of machine learning.• Construct supervised learning models.• Construct unsupervised learning algorithms.• Evaluate and compare different models

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



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Sem	04
Sub Code	AD3491
Sub Name	FUNDAMENTALS OF DATA SCIENCE AND ANALYTICS
Course Outcome	<ul style="list-style-type: none">• Explain the data analytics pipeline• Describe and visualize data• Perform statistical inferences from data• Analyze the variance in the data• Build models for predictive analytics

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



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Sem	04
Sub Code	CS3591
Sub Name	COMPUTER NETWORKS
Course Outcome	<ul style="list-style-type: none">• Explain the basic layers and its functions in computer networks.• Understand the basics of how data flows from one node to another.• Analyze routing algorithms.• Describe protocols for various functions in the network.• Analyze the working of various application layer protocols

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



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Sem	04
Sub Code	GE3451
Sub Name	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY
Course Outcome	<ul style="list-style-type: none"> • To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation. • To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society. • To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations. • To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development. • To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	2	1	-	-	-	2	3	-	-	-	-	2	-	-	-
2	3	2	-	-	-	3	3	-	-	-	-	2	-	-	-
3	3	-	1	-	-	2	2	-	-	-	-	2	-	-	-
4	3	2	1	1	-	2	2	-	-	-	-	2	-	-	-
5	3	2	1	-	-	2	2	-	-	-	-	1	-	-	-
Avg.	2.8	1.8	1	1	-	2.2	2.4	-	-	-	-	1.8	-	-	-



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Sem	04
Sub Code	AD3411
Sub Name	DATA SCIENCE AND ANALYTICS LABORATORY
Course Outcome	<ul style="list-style-type: none">• Write python programs to handle data using Numpy and Pandas• Perform descriptive analytics• Perform data exploration using Matplotlib• Perform inferential data analytics• Build models of predictive analytics

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



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Sem	04
Sub Code	AD3461
Sub Name	MACHINE LEARNING LABORATORY
Course Outcome	<ul style="list-style-type: none">• Apply suitable algorithms for selecting the appropriate features for analysis.• Implement supervised machine learning algorithms on standard datasets and evaluate the performance.• Apply unsupervised machine learning algorithms on standard datasets and evaluate the performance.• Build the graph based learning models for standard data sets.• Assess and compare the performance of different ML algorithms and select the suitable one based on the application.

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



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Sem	05
Sub Code	AD3501
Sub Name	DEEP LEARNING
Course Outcome	<ul style="list-style-type: none">• Explain the basics in deep neural networks• Apply Convolution Neural Network for image processing• Apply Recurrent Neural Network and its variants for text analysis• Apply model evaluation for various applications• Apply autoencoders and generative models for suitable applications

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	2	2	3	1	-	-	-	2	3	1	2	3	3	3
2	2	2	2	3	3	-	-	-	1	2	2	3	1	1	3
3	3	3	3	3	3	-	-	-	2	1	1	2	2	1	3
4	3	3	1	1	1	-	-	-	1	3	1	3	2	1	1
5	3	2	2	2	3	-	-	-	2	3	2	2	2	3	3
AVG	2.8	2.4	2	2.4	2.2	-	-	-	1.6	2.4	1.4	2.4	2	1.8	2.6



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Sem	05
Sub Code	CW3551
Sub Name	DATA AND INFORMATION SECURITY
Course Outcome	<ul style="list-style-type: none"> • Understand the basics of data and information security • Understand the legal, ethical and professional issues in information security • Understand the various authentication schemes to simulate different applications. • Understand various security practices and system security standards • Understand the Web security protocols for E-Commerce applications.

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	2	3	1	-	-	-	-	1	3	1	2	3	1	1
2	1	3	3	3	2	-	-	-	1	2	2	2	1	2	2
3	2	3	3	3	1	-	-	-	1	3	1	2	1	2	1
4	3	3	1	1	1	-	-	-	3	1	1	3	2	3	3
5	3	2	2	3	2	-	-	-	1	2	1	2	2	2	1
AVG	2.4	2.6	2.4	2.2	1.5	-	-	-	1.4	2.2	1.2	2.2	1.8	2	1.6



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Sem	05
Sub Code	CS3551
Sub Name	DISTRIBUTED COMPUTING
Course Outcome	<ul style="list-style-type: none"> • Explain the foundations of distributed systems (K2) • Solve synchronization and state consistency problems (K3) • Use resource sharing techniques in distributed systems (K3) • Apply working model of consensus and reliability of distributed systems (K3) • Explain the fundamentals of cloud computing (K2)

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	2	2	3	3	1	-	-	-	2	1	3	3	2	1	1
2	1	3	2	1	2	-	-	-	2	2	2	2	1	3	2
3	2	2	1	3	3	-	-	-	3	2	1	1	1	2	1
4	1	2	2	3	1	-	-	-	3	3	2	1	3	1	1
5	3	3	1	2	3	-	-	-	3	3	3	1	3	2	3
AVg.	1.8	2.4	1.8	2.4	2	-	-	-	2.6	2.2	2.2	1.6	2	1.8	1.6



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Sem	05
Sub Code	CCS334
Sub Name	BIG DATA ANALYTICS
Course Outcome	<ul style="list-style-type: none"> Describe big data and use cases from selected business domains. Explain NoSQL big data management. Install, configure, and run Hadoop and HDFS. Perform map-reduce analytics using Hadoop. Use Hadoop-related tools such as HBase, Cassandra, Pig, and Hive for big data analytics

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	3	3	3	3	-	-	-	2	2	3	1	1	3	3
2	3	3	2	3	2	-	-	-	2	2	3	3	2	3	2
3	3	3	3	2	3	-	-	-	2	2	1	2	2	3	3
4	2	3	3	3	3	-	-	-	2	2	3	2	3	3	2
5	3	3	3	3	3	-	-	-	3	1	3	2	3	2	3
AVg.	2.8	3	2.8	2.8	2.8	-	-	-	2.2	1.8	2.6	2	2.2	2.8	2.6



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Sem	05
Sub Code	AD3511
Sub Name	DEEP LEARNING LABORATORY
Course Outcome	<ul style="list-style-type: none">• Apply deep neural network for simple problems (K3)• Apply Convolution Neural Network for image processing (K3)• Apply Recurrent Neural Network and its variants for text analysis (K3)• Apply generative models for data augmentation (K3)• Develop real-world solutions using suitable deep neural networks (K4)

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	2	1	1	1	-	-	-	3	2	3	2	3	3	2
2	1	3	2	2	2	-	-	-	3	2	2	2	1	3	1
3	3	2	1	2	1	-	-	-	2	3	1	1	2	3	3
4	3	3	1	2	1	-	-	-	1	3	2	2	3	2	2
5	3	3	3	3	2	-	-	-	1	2	3	1	3	3	2
AVG	2.6	2.6	1.6	2	1.4	-	-	-	2	2.4	2.2	1.6	2.4	2.8	2



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Sem	05
Sub Code	AD3512
Sub Name	SUMMER INTERNSHIP
Course Outcome	<ul style="list-style-type: none">• Industry Practices, Processes, Techniques, technology, automation and other core aspects of software industry• Analyze, Design solutions to complex business problems• Build and deploy solutions for target platform• Preparation of Technical reports and presentation



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Sem	05
Sub Code	CCS335
Sub Name	Cloud Computing
Course Outcome	<ul style="list-style-type: none">• Understand the design challenges in the cloud.• Apply the concept of virtualization and its types.• Experiment with virtualization of hardware resources and Docker.• Develop and deploy services on the cloud and set up a cloud environment.• Explain security challenges in the cloud environment.

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	2	1	1	1	-	-	-	2	3	1	3	2	1	3
2	3	1	2	2	1	-	-	-	1	2	1	3	2	2	1
3	2	3	2	3	1	-	-	-	3	1	1	3	1	1	1
4	1	2	3	3	3	-	-	-	3	3	1	2	1	3	3
5	2	3	3	1	3	-	-	-	2	2	1	2	2	2	3
AVG	2.2	2.2	2.2	2	1.8	-	-	-	2.2	2.2	1	2.6	1.6	1.8	2.2



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Sem	05
Sub Code	CCS358
Sub Name	PRINCIPLES OF PROGRAMMING LANGUAGES
Course Outcome	<ul style="list-style-type: none"> Describe syntax and semantics of programming languages Explain data, data types, and basic statements of programming languages Design and implement subprogram constructs Apply object-oriented, concurrency, and event handling programming constructs and Develop programs in Scheme, ML, and Prolog Understand and adopt new programming languages

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	2	2	3	2	1	-	-	-	-	-	-	3	2	3	-
2	3	3	3	2	2	-	-	-	-	-	-	3	2	3	-
3	3	3	3	2	2	-	-	-	-	-	-	3	2	3	-
4	3	3	3	3	2	2	-	-	-	-	-	-	3	2	-
5	3	3	3	3	3	3	2	2	1	3	1	3	3	3	-
AVg.	2.8	2.8	3	2.4	2	2.5	2	2	1	3	1	3	2.4	2.8	-



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Sem	06
Sub Code	CCS354
Sub Name	NETWORK SECURITY
Course Outcome	<ul style="list-style-type: none">• Classify the encryption techniques• Illustrate the key management technique and authentication.• Evaluate the security techniques applied to network and transport layer• Discuss the application layer security standards.• Apply security practices for real time applications.

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	3	2	2	2	-	-	-	2	1	2	1	2	3	1
2	1	1	3	2	2	-	-	-	2	2	1	1	3	1	2
3	1	2	1	1	2	-	-	-	3	3	1	3	2	1	3
4	2	2	3	2	3	-	-	-	3	3	2	1	2	1	3
5	2	1	3	2	2	-	-	-	2	1	1	3	2	1	1
AVG	1.8	1.8	2.4	1.8	2.2	-	-	-	2.4	2	1.4	1.8	2.2	1.4	2



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Sem	06
Sub Code	CCS367
Sub Name	STORAGE TECHNOLOGIES
Course Outcome	<ul style="list-style-type: none">• Demonstrate the fundamentals of information storage management and various models of Cloud infrastructure services and deployment• Illustrate the usage of advanced intelligent storage systems and RAID• Interpret various storage networking architectures - SAN, including storage subsystems and virtualization• Examine the different role in providing disaster recovery and remote replication technologies• Infer the security needs and security measures to be employed in information storage management

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	1	2	1	3	3	-	-	-	1	1	1	3	1	2	1
2	3	1	2	3	3	-	-	-	3	2	3	2	2	3	1
3	1	1	3	2	2	-	-	-	3	1	1	2	2	3	3
4	3	2	1	2	2	-	-	-	1	1	3	1	3	2	1
5	1	3	2	1	2	-	-	-	1	2	3	1	3	2	1
AVG	1.8	1.8	1.8	2.2	2.4	-	-	-	1.8	1.4	2.2	1.8	2.2	2.4	1.4



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Sem	06
Sub Code	CCS341
Sub Name	Data Warehousing
Course Outcome	<ul style="list-style-type: none">• Design data warehouse architecture for various Problems• Apply the OLAP Technology• Analyse the partitioning strategy• Critically analyze the differentiation of various schema for given problem• Frame roles of process manager & system manager

CO	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	3	2	2	-	-	-	3	-	-	3
2	3	2	2	2	3	-	-	-	2	-	2	2
3	3	3	3	3	-	-	-	-	-	-	-	3
4	3	3	3	3	-	-	-	-	-	-	-	3
5	3	2	2	2	-	2	-	-	-	-	2	2
AVg.	3	2.6	2.6	1.2	2.5	1	-	-	2.5	-	2	2.6



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Sem	06
Sub Code	CCS336
Sub Name	CLOUD SERVICES MANAGEMENT
Course Outcome	<ul style="list-style-type: none">• Exhibit cloud-design skills to build and automate business solutions using cloud technologies.• Possess Strong theoretical foundation leading to excellence and excitement towards adoption of cloud-based services• Solve the real world problems using Cloud services and technologies

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	3	1	1	1	-	-	-	2	1	3	2	2	1	3
2	3	1	2	3	2	-	-	-	1	2	3	1	2	2	2
3	1	1	3	1	3	-	-	-	3	3	1	1	3	2	1
4	1	1	1	2	3	-	-	-	2	3	3	1	1	1	1
5	1	3	3	2	2	-	-	-	1	3	1	2	1	3	2
AVG	1.8	1.8	2	1.8	2.2	-	-	-	1.8	2.4	2.2	1.4	1.8	1.8	1.8



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Sem	06
Sub Code	CS3691
Sub Name	EMBEDDED SYSTEMS AND IOT
Course Outcome	<ul style="list-style-type: none">• Explain the architecture of embedded processors.• Write embedded C programs.• Design simple embedded applications.• Compare the communication models in IOT• Design IoT applications using Arduino/Raspberry Pi /open platform.

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	1	1	3	1	-	-	-	3	1	2	3	2	1	1
2	2	3	1	3	2	-	-	-	1	2	3	1	1	1	2
3	2	2	3	2	3	-	-	-	1	3	1	1	2	1	3
4	2	2	2	1	1	-	-	-	1	3	1	1	2	2	3
5	3	2	1	1	3	-	-	-	3	2	3	2	1	3	1
AVG	2.4	2	1.6	2	2	-	-	-	1.8	2.2	2	1.6	1.6	1.6	2