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

E-Box Colleges

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROGRAMME: B.E.COMPUTER SCIENCE AND ENGINEERING

COURSE OUTCOMES(COs)

Semester	01
Subject Code	HS3152
Subject Name	PROFESSIONAL ENGLISH I
Course Outcome	• 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	• 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	• 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	-	-	-	-	-	-	-	-	-
Avg	3	3	1.6	1.2	1.8	1	-	-	-	-	-	1	-	-	-

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E-Box Colleges

Sem	01
Subject Code	CY3151
Subject Name	ENGINEERING CHEMISTRY
Course Outcome	• 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	-	-	-
Avg	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	- 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	• 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	PHYSICS LABORATORY
Course Outcome	• Understand the functioning of various physics laboratory equipment. • Use graphical models to analyze laboratory data. • Use mathematical models as a medium for quantitative reasoning and describing physical reality. • Access, process and analyze scientific information. • Solve problems individually and collaboratively.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	3	1	1	-	-	-	-	-	-	-	-	-	-
2	3	3	2	1	1	-	-	-	-	-	-	-	-	-	-
3	3	2	3	1	1	-	-	-	-	-	-	-	-	-	-
4	3	3	2	1	1	-	-	-	-	-	-	-	-	-	-
5	3	2	3	1	1	-	-	-	-	-	-	-	-	-	-
AVG	3	2.4	2.6	1	1	-	-	-	-	-	-	-	-	-	-

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Sem	01
Subject Code	BS3171
Subject Name	CHEMISTRY LABORATORY
Course Outcome	- 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	01
Subject Code	GE3172
Subject Name	ENGLISH LABORATORY
Course Outcome	• 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	• 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	- 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	- Gain knowledge on classical and quantum electron theories, and energy band structures - Acquire knowledge on basics of semiconductor physics and its applications in various devices - Get knowledge on magnetic properties of materials and their applications in data storage, - Have the necessary understanding on the functioning of optical 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	• 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
Avg	2	1.8	1	-	-	-	-	1	-	-	-	2	-	-	1

Sem	02
Subject Code	GE3251
Subject Name	ENGINEERING GRAPHICS
Course Outcome	• 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	-
Av	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-

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Sem	02
Subject Code	CS3251
Subject Name	PROGRAMMING IN C
Course Outcome	• Demonstrate knowledge on C Programming constructs • Develop simple applications in C using basic constructs • Design and implement applications using arrays and strings • Develop and implement modular applications in C using functions. • Develop applications in C using structures and pointers. • Design applications using sequential and random access file processing

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

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Sem	02
Subject Code	GE3271
Subject Name	ENGINEERING PRACTICES LABORATORY
Course Outcome	• 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 equipment's; 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
Av	3	2	-	-	1	1	1	-	-	-	-	2	2	1	1

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Sem	02
Subject Code	CS3271
Subject Name	PROGRAMMING IN C LABORATORY
Course Outcome	- Demonstrate knowledge on C programming constructs. - Develop programs in C using basic constructs. - Develop programs in C using arrays. - Develop applications in C using strings, pointers, functions. - Develop applications in C using structures. - Develop applications in C using file processing.

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

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Sem	02
Sub Code	GE3272
Sub Name	COMMUNICATION LABORATORY
Course Outcome	• 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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
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	-	-	-
AVg.	2.4	2.8	3	3	1.8	3	3	3	3	3	3	3	-	-	-

Sem	03
Sub Code	MA3354
Sub Name	DISCRETE MATHEMATICS
Course Outcome	- 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	-	-	-	-	-

Sem	03
Sub Code	CS3351
Sub Name	DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION
Course Outcome	• 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	1.8	1.6	1	1	1	1	1.6	2.6	1.4	2.6	1.6

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Sem	03
Sub Code	CS3352
Sub Name	FOUNDATIONS OF DATA SCIENCE
Course Outcome	• Define the data science process • Understand different types of data description for data science process • Gain knowledge on relationships between data • Use the Python Libraries for Data Wrangling • Apply visualization Libraries in Python to interpret and explore data

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

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Sem	03
Sub Code	CS3301
Sub Name	DATA STRUCTURES
Course Outcome	• Define linear and non-linear data structures. • Implement linear and non–linear data structure operations. • Use appropriate linear/non–linear data structure operations for solving a given problem. • Apply appropriate graph algorithms for graph applications. • Analyze the various searching and sorting algorithms.

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

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Sem	03
Sub Code	CS3391
Sub Name	OBJECT ORIENTED PROGRAMMING
Course Outcome	- Apply the concepts of classes and objects to solve simple problems - Develop programs using inheritance, packages and interfaces - Make use of exception handling mechanisms and multithreaded model to solve real world problems - Build Java applications with I/O packages, string classes, Collections and generics concepts - Integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications

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

Sem	03
Sub Code	CS3311
Sub Name	DATA STRUCTURES LABORATORY
Course Outcome	• Implement Linear data structure algorithms. • Implement applications using Stacks and Linked lists • Implement Binary Search tree and AVL tree operations. • Implement graph algorithms. • Analyze the various searching and sorting algorithms.

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

Sem	03
Sub Code	CS3381
Sub Name	OBJECT ORIENTED PROGRAMMING LABORATORY
Course Outcome	• Design and develop java programs using object oriented programming concepts • Develop simple applications using object oriented concepts such as package, exceptions • Implement multithreading, and generics concepts • Create GUIs and event driven programming applications for real world problems • Implement and deploy web applications using Java

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	-	-	-	-	1	2	2	2	1	2	3
2	2	1	3	1	-	-	-	-	2	3	3	2	1	3	1
3	2	2	1	2	1	-	-	-	1	2	1	3	2	3	2
4	2	2	1	3	-	-	-	-	3	1	1	1	2	1	2
5	1	3	3	1	3	-	-	-	1	1	1	1	2	1	2
AVg.	2	2	2	2	2	-	-	-	2	2	2	2	2	2	2

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Sem	03
Sub Code	CS3361
Sub Name	DATA SCIENCE LABORATORY
Course Outcome	• Make use of the python libraries for data science • Make use of the basic Statistical and Probability measures for data science. • Perform descriptive analytics on the benchmark data sets. • Perform correlation and regression analytics on standard data sets • Present and interpret data using visualization packages in Python..

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	3	3	1	3	2
2	3	2	2	3	1	-	-	-	3	1	3	2	1	3	3
3	3	2	1	3	1	-	-	-	2	1	1	1	3	2	3
4	2	3	1	3	-	-	-	-	2	3	2	3	3	3	1
5	1	2	3	1	1	-	-	-	2	1	3	1	1	3	3
AVg.	2	2	2	2	1	-	-	-	2	2	2	2	2	3	2

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Sem	03
Sub Code	GE3361
Sub Name	PROFESSIONAL DEVELOPMENT
Course Outcome	- 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.

Sem	04
Sub Code	CS3452
Sub Name	THEORY OF COMPUTATION
Course Outcome	• Construct automata theory using Finite Automata • Write regular expressions for any pattern • Design context free grammar and Pushdown Automata • Design Turing machine for computational functions • Differentiate between decidable and undecidable problems

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

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Sem	04
Sub Code	CS3491
Sub Name	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
Course Outcome	• Use appropriate search algorithms for problem solving • Apply reasoning under uncertainty • Build supervised learning models • Build ensembling and unsupervised models • Build deep learning neural network models

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	3	-	-	-	-	1	3	3	3	1	2	2
2	1	1	1	3	1	-	-	-	1	2	1	3	2	3	2
3	2	1	2	1	1	-	-	-	2	1	1	3	1	1	1
4	3	1	3	1	-	-	-	-	2	1	2	1	2	2	2
5	3	1	1	2	2	-	-	-	3	1	2	3	2	1	2
AVg.	2	1	2	2	1	-	-	-	2	2	2	3	2	2	2

Sem	04
Sub Code	CS3492
Sub Name	DATABASE MANAGEMENT SYSTEMS
Course Outcome	• Construct SQL Queries using relational algebra • Design database using ER model and normalize the database • Construct queries to handle transaction processing and maintain consistency of the database • Compare and contrast various indexing strategies and apply the knowledge to tune the performance of the database • Appraise how advanced databases differ from Relational Databases and find a suitable database for the given requirement..

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	-	-	-	2	1	1	1	2	1	3
2	3	1	1	1	1	-	-	-	2	3	3	3	3	1	2
3	3	2	3	2	1	-	-	-	2	1	1	2	2	3	3
4	1	2	3	2	-	-	-	-	3	2	3	3	1	2	3
5	1	1	3	3	2	-	-	-	1	3	3	1	2	2	2
AVg.	2	2	3	2	1	-	-	-	2	2	2	2	2	2	3

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Sem	04
Sub Code	CS3401
Sub Name	ALGORITHMS
Course Outcome	• Analyze the efficiency of algorithms using various frameworks • Apply graph algorithms to solve problems and analyze their efficiency. • Make use of algorithm design techniques like divide and conquer, dynamic programming and greedy techniques to solve problems • Use the state space tree method for solving problems. • Solve problems using approximation algorithms and randomized algorithms

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	2	3	-	-	-	-	1	-	-	-	-	1	-	1	-
3	1	2	3	1	-	-	2	-	-	-	-	-	-	1	1
4	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
AVg.	2.67	1.8	3	1	-	-	1.33	-	-	-	-	1	-	1	1

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Sem	04
Sub Code	CS3451
Sub Name	INTRODUCTION TO OPERATING SYSTEMS
Course Outcome	• 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 Virtualization
	• Compare 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	2	2	-	-	-	-	3	2	3	1	1	2	2
2	2	2	3	1	1	-	-	-	2	1	1	2	2	1	2
3	1	3	2	2	1	-	-	-	2	2	1	1	1	2	2
4	1	3	3	3	-	-	-	-	1	2	1	2	1	3	2
5	3	1	2	1	1	-	-	-	3	2	3	2	2	2	1
AVg.	2	2	2	2	1	-	-	-	2	2	2	2	1	2	**2**

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Sem	04
Sub Code	GE3451
Sub Name	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY
Course Outcome	• 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	CS3461
Sub Name	OPERATING SYSTEMS LABORATORY
Course Outcome	• Define and implement UNIX Commands. • Compare the performance of various CPU Scheduling Algorithms. • Compare and contrast various Memory Allocation Methods. • Define File Organization and File Allocation Strategies. • Implement various Disk Scheduling Algorithms.

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	1	1	-	-	-	1	3	3	3	2	1	3
2	3	1	1	2	2	-	-	-	3	2	1	1	3	1	2
3	3	3	2	1	2	-	-	-	3	3	1	2	2	2	2
4	1	2	2	3	2	-	-	-	3	1	3	1	1	2	1
5	2	2	1	1	3	-	-	-	1	2	2	3	1	3	3
AVg.	2	2	2	2	2	-	-	-	2	2	2	2	2	2	2

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Sem	04
Sub Code	CS3481
Sub Name	DATABASE MANAGEMENT SYSTEMS LABORATORY
Course Outcome	• Create databases with different types of key constraints. • Construct simple and complex SQL queries using DML and DCL commands. • Use advanced features such as stored procedures and triggers and incorporate in GUI based application development. • Create an XML database and validate with meta-data (XML schema). • Create and manipulate data using NOSQL database..

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	1	3	2	2	3	2
2	2	2	3	2	2	-	-	-	1	2	3	3	2	1	2
3	3	3	2	1	1	-	-	-	1	1	1	3	2	3	3
4	1	3	3	3	1	-	-	-	1	1	3	2	3	1	3
5	3	2	1	1	1	-	-	-	2	2	3	1	3	1	2
AVg.	2	3	2	2	1	-	-	-	2	1	3	2	2	2	2

Sem	05
Sub Code	CS3591
Sub Name	Computer Networks
Course Outcome	• 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	-	2	-	-		-	-	-	-	-	-	-	3	-	-
2	-	1	-	-	2	-	-	-	-	-	-	2	-	2	-
3	-	2	-	-	3	-	-	-	-	-	-	-	-	3	-
4	-		-	1	2	-	-	-	-	3	-	-	-	-	-
5	-	3	2	-	-	-	-	-	-	-	-	-	-	-	3
AVg.	-	1	-	-	1	-	-	-	-	1	-	-	-	1	1

Sem	05
Sub Code	CS3501
Sub Name	COMPILER DESIGN
Course Outcome	• Understand the techniques in different phases of a compiler • Design a lexical analyser for a sample language and learn to use the LEX tool. • Apply different parsing algorithms to develop a parser and learn to use YACC tool • Understand semantics rules (SDT), intermediate code generation and run-time environment. • Implement code generation and apply code optimization 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	3	-	-	-	-	3	3	1	3	2	3	2
2	3	3	3	3	3	-	-	-	3	2	3	2	2	1	2
3	3	3	2	2	3	-	-	-	3	1	1	1	2	2	3
4	3	2	2	1	1	-	-	-	2	3	2	3	1	2	1
5	3	3	3	2	1	-	-	-	2	1	1	3	2	1	2
AVg.	3.00	2.80	2.60	2.20	2.00	-	-	-	2.60	2.00	1.60	2.40	1.80	1.80	2.00

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Sem	05
Sub Code	CB3491
Sub Name	CRYPTOGRAPHY AND CYBER SECURITY
Course Outcome	• Understand the fundamentals of networks security, security architecture, threats and vulnerabilities • Apply the different cryptographic operations of symmetric cryptographic algorithms • Apply the different cryptographic operations of public key cryptography • Apply the various Authentication schemes to simulate different applications. • Understand various cybercrimes and cyber security.

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	2	2	-	-	-	1	-	-	1	2	3	3
2	3	3	3	3	3	-	-	-	2	-	-	1	3	3	3
3	3	3	3	3	3	-	-	-	2	-	-	1	3	3	3
4	3	3	3	3	3	-	-	-	2	-	-	1	3	3	3
5	3	2	3	2	3	-	-	-	3	-	-	2	**3**	2	3
AVg.	**3**	**2.6**	**2.6**	**2.6**	**2.8**	**-**	**-**	**-**	**2**	**-**	**-**	**1.2**	**2.8**	**2.8**	**3**

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Sem	05
Sub Code	CS3551
Sub Name	DISTRIBUTED COMPUTING
Course Outcome	• 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

Sem	05
Sub Code	CCS375
Sub Name	WEB TECHNOLOGIES
Course Outcome	• Construct a basic website using HTML and Cascading Style Sheets • Build dynamic web page with validation using Java Script objects and by applying differentevent handling mechanisms. • Develop server side programs using Servlets and JSP. • Construct simple web pages in PHP and to represent data in XML format. • Develop interactive web 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	3	3	-	-	-	1	3	3	1	3	2	3
2	2	2	2	1	2	-	-	-	2	2	1	3	2	2	2
3	1	1	3	2	3	-	-	-	1	2	1	1	1	2	1
4	2	3	3	1	2	-	-	-	3	1	2	2	2	2	2
5	1	2	3	2	2	-	-	-	2	1	3	1	1	1	2
AVg.	1.8	2	2.8	1.8	2.4	-	-	-	1.8	1.8	2	1.6	1.8	1.8	2

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E-Box Colleges

Sem	05
Sub Code	CCS358
Sub Name	PRINCIPLES OF PROGRAMMING LANGUAGES
Course Outcome	• 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 constructsand 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	• 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

Sem	06
Sub Code	CCS367
Sub Name	STORAGE TECHNOLOGIES
Course Outcome	• 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	• 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	• 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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E-Box Colleges

Sem	06
Sub Code	CS3691
Sub Name	EMBEDDED SYSTEMS AND IOT
Course Outcome	• 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

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Sem	06
Sub Code	CCS356
Sub Name	OBJECT ORIENTED SOFTWARE ENGINEERING
Course Outcome	- Compare various Software Development Lifecycle Models - Evaluate project management approaches as well as cost and schedule estimation strategies. - Perform formal analysis on specifications. - Use UML diagrams for analysis and design. - Architect and design using architectural styles and design patterns, and test the system

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