SEMESTER – III
THEORY

Course Title:Analog and Digital Electronics	**Code: ESC 301**
Type of Course: Theory	**Course Designation: Compulsory**
Semester: 3rd	**Contact Hours: 3L/week**
Continuous Assessment: 25 Marks	**Final Exam: 70 Marks**
Writer: Course Coordinator	**Approved by HoD (convenor of DAB)**

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ESC 301.CO1	Explain Different Classes of Amplifiers - (Class-A, B, AB and C, power, efficiency; Summarize the basic concepts of Feedback and Oscillation. Demonstrate Phase Shift, Wein Bridge oscillators Astable & Monostable Multivibrators; Schimtt Trigger circuits, 555 Timer.	Explain	K2
ESC 301.CO2	Define the basic concepts of Boolean algebra, binary number system. 1's and 2's complement methods, Binary arithmetic. Define the representation in SOP and POS forms;	Define	K1
ESC 301.CO3	Demonstrate the concept of Minimization of logic using algebraic and k-map. Build various combinational circuits like Adder and Subtractor circuits, Encoder, Decoder, Comparator, Multiplexer, De-Multiplexer and Parity Generator.	Demonstrate	K2
ESC 301.CO4	Explain Sequential Circuits - Basic Flip-flop & Latch, Flip-flops -SR, JK, D, T and JK Master-slave Flip Flops.	Explain	K2
ESC 301.CO5	Build Registers (SISO, SIPO, PIPO, PISO) Ring counter, Johnson counter, Synchronous and Asynchronous counters, Mod N Counter.	Build	K6
ESC 301.CO6	Explain A/D and D/A conversion techniques – Basic concepts (D/A :R-2-R only A/D: successiveapproximation). Explain Logic families- TTL, ECL, MOS and CMOS - basic concepts.	Explain	K2

Mapping of COs with POs and PSOs (Course Articulation Matrix):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	3	3	3
CO2	3	3	2	2	-	-	-	-	-	1	-	3	3	3
CO3	3	2	2	2	1	-	-	-	-	1	-	3	3	3
CO4	3	3	3	2	3	-	-	-	-	1	1	3	3	3
CO5	3	3	2	2	2	-	-	-	-	-	2	3	3	3
CO6	3	2	1	1	-	-	-	-	-	-	2	3	3	3
AVG.	3	2.6	2	1.8	2	0	0	0	0	1	1	3	3	3

University Syllabus :

Unit	Content	Hrs/Unit
1	Different Classes of Amplifiers - (Class-A, B, AB and C - basic concepts, power, efficiency; Recapitulation of basic concepts of Feedback and Oscillation, Phase Shift, Wein Bridge oscillators Astable & Monostable Multivibrators; Schimtt Trigger circuits, 555 Timer	9
2	Binary Number System & Boolean Algebra (recapitulation); BCD, ASCII, EBDIC, Gray codes and their conversions; Signed binary number representation with 1's and 2's complement methods, Binary arithmetic, Venn diagram, Boolean algebra (recapitulation); Representation in SOP and POS forms; Minimization of logic expressions by algebraic method. Combinational circuits - Adder and Subtractor circuits (half & full adder & subtractor); Encoder, Decoder, Comparator, Multiplexer, DeMultiplexer and Parity Generator	11

3	Sequential Circuits - Basic Flip-flop & Latch, Flip-flops -SR, JK, D, T and JK Master-slave Flip Flops, Registers (SISO, SIPO, PIPO, PISO) Ring counter, Johnson counter Basic concept of Synchronous and Asynchronous counters (detail design of circuits excluded), Design of Mod N Counter	10
4	A/D and D/A conversion techniques – Basic concepts (D/A :R-2-R only [2L] A/D: successive approximation [2L]) Logic families- TTL, ECL, MOS and CMOS - basic concepts. (2L)	6

Course Title:Data Structure & Algorithms	**Code: PCC-CS301**
Type of Course: Theory	**Course Designation: Compulsory**
Semester: 3rd	**Contact Hours: 3L/week**
Continuous Assessment: 25 Marks	**Final Exam: 70 Marks**
Writer: Course Coordinator	**Approved by HoD (convenor of DAB)**

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS301.CO1	Construct algorithms from problems.	Construct	K3
PCC-CS301.CO2	Understand the basics of abstract data types.	Understand	K2
PCC-CS301.CO3	Categorize the property of linear and nonlinear data structures.	Categorize	K4
PCC-CS301.CO4	Learn the use of Tree and graph.	Learn	K3
PCC-CS301.CO5	Compare different shorting and searching methods.	Compare	K5
PCC-CS301.CO6	Learn the use of hashing.	Learn	K3

Mapping of COs with POs and PSOs (Course Articulation Matrix):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	2	1	1	1	1	1	2	2	3	3
CO2	3	3	3	3	-	1	1	1	1	1	2	2	3	3
CO3	3	3	3	3	-	-	-	-	1	1	-	2	2	2
CO4	3	3	3	3	-	-	-	-	1	1	-	2	2	2
CO5	3	3	3	3	-	-	-	-	1	1	-	2	2	2
CO6	3	3	3	3	-	-	-	-	1	1	-	2	2	2
AVG.	3	3	3	3	2	1	1	1	1	1	2	2.00	2.33	2.33

University Syllabus :

Unit	Content	Hrs/Unit
1	Introduction: Basic Terminologies: Elementary Data Organizations, Data Structure Operations: insertion, deletion, traversal etc.; Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off. Searching: Linear Search and Binary Search Technique sand their complexity analysis.	10
2	Stacks and Queues: ADT Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation – corresponding algorithms and complexity analysis. ADT queue, Types of Queue: Simple Queue, Circular Queue, Priority Queue; Operations on each types of Queues: Algorithms and their analysis.	9
3	Linked Lists: Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue, Header nodes, Doubly linked list: operations on it and algorithmic analysis; Circular Linked Lists: all operations their algorithms and the complexity analysis. Trees: Basic Tree Terminologies, Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, AVL Tree; Tree operations on each of the trees and their algorithms with complexity analysis. Applications of Binary Trees. B Tree, B+ Tree: definitions, algorithms and analysis	10

4	Sorting and Hashing: Objective and properties of different sorting algorithms: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort; Performance and Comparison among all the methods, Hashing. Graph: BasicTerminologies and Representations, Graph search and traversal algorithms and complexity analysis.	9

Course Title:Computer Organisation	**Code: PCC-CS302**
Type of Course: Theory	**Course Designation: Compulsory**
Semester: 3rd	**Contact Hours: 3L/week**
Continuous Assessment: 25 Marks	**Final Exam: 70 Marks**
Writer: Course Coordinator	**Approved by HoD (convenor of DAB)**

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS302.CO1	Illustrate the history of modern computers and the Von Neumann architecture.	Illustrate	K2
PCC-CS302.CO2	Demonstrate basic number systems, Binary numbers, representation of signed and unsigned numbers, Floating point representation.	Demonstrate	K2
PCC-CS302.CO3	Define addressing modes, instruction formats.	Define	K1
PCC-CS302.CO4	Distinguish the organization of various parts of a system memory hierarchy i.e. cache memory , virtual memory etc.	Distinguish	K4
PCC-CS302.CO5	Classify basics of systems topics like, single-cycle (MIPS), multi-cycle (MIPS), parallel, pipelined, superscalar, and RISC/CISC architectures.	Classify	K4
PCC-CS302.CO6	Define different control unit operations and I/O organization.	Define	K1

Mapping of COs with POs and PSOs (Course Articulation Matrix):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	2	-	-	-	-	-	-	-	3	2
CO2	3	3	3	3	3	-	-	-	-	-	1	-	3	2
CO3	3	3	3	1	3	-	-	-	-	-	2	-	1	3
CO4	3	2	3	3	2	-	-	-	-	-	1	-	2	3
CO5	3	2	3	3	-	-	-	-	-	-	2	2	3	3
CO6	3	3	3	2	3	-	-	-	-	-	3	3	3	3
AVG.	3	2.67	3	2.5	2.6	0	0	0	0	0	1.8	2.5	2.5	2.33

University Syllabus :

Unit	Content	Hrs/Unit
1	Basic organization of the stored program computer and operation sequence for execution of a program. Role of operating systems and compiler/assembler. Fetch, decode and execute cycle, Concept of operator, operand, registers and storage, Instruction format. Instruction sets and addressing modes. [7L] Commonly used number systems. Fixed and floating point representation of numbers.[1L]	8
2	Overflow and underflow. Design of adders - ripple carry and carry look ahead principles. [3L] Design of ALU. [1L] Fixed point multiplication -Booth's algorithm. [1L] Fixed point division - Restoring and non-restoring algorithms. [2L] Floating point - IEEE 754 standard. [1L]	8
3	Memory unit design with special emphasis on implementation of CPU-memory interfacing.	10

	[2L] Memory organization, static and dynamic memory, memory hierarchy, associative memory. [3L] Cache memory, Virtual memory. Data path design for read/write access. [5L]	
4	Design of control unit - hardwired and microprogrammed control. [3L] Introduction to instruction pipelining. [2L] Introduction to RISC architectures. RISC vs CISC architectures. [2L] I/O operations - Concept of handshaking, Polled I/O, interrupt and DMA. [3L]	10

Course Title:Mathematics-III	**Code: BSC 301**
Type of Course: Theory	**Course Designation: Compulsory**
Semester: 3rd	**Contact Hours: 2L/week**
Continuous Assessment: 25 Marks	**Final Exam: 70 Marks**
Writer: Course Coordinator	**Approved by HoD (convenor of DAB)**

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
BSC 301.CO1	Apply the concept of convergence of infinite series in many approximation techniques in engineering disciplines.	Apply	K3
BSC 301.CO2	Learn the tools of power series and Fourier series to analyze engineering problems and apply it to solve different problems by expressing functions in suitable series form.	Learn	K2
BSC 301.CO3	Apply the knowledge for addressing the real life problems which comprises of several variables or attributes and identify extremum points of different surfaces of higher dimensions.	Apply	K3
BSC 301.CO4	Apply the knowledge of double and triple integral in different fields of Engineering to find area, volume and shape of different objects and also to get some physical properties like centre of gravity, moment of inertia, etc.	Apply	K3
BSC 301.CO5	Solve and model many core engineering problems with application of ODE of 1st order and higher order, Simultaneous Linear Differential Equation, Improper Integral and Laplace Transform.	Solve	K3
BSC 301.CO6	Identify and solve different type of graphs and Analyze/Model application of Graph Theory in Information Science.	Identify	K3

Mapping of COs with POs and PSOs (Course Articulation Matrix):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	1	-	-	-	-	-	-	-	-	2	1
CO2	3	3	2	1	-	-	-	-	-	-	-	-	2	1
CO3	3	3	2	1	-	-	-	-	-	-	-	-	2	1
CO4	3	3	2	1	-	-	-	-	-	-	-	-	2	1
CO5	3	2	2	-	-	-	-	-	-	-	-	-	2	1
CO6	3	3	2	1	-	-	-	-	-	-	-	-	2	1
AVG.	3	3	2	1	0	0	0	0	0	0	0	0	2	1

University Syllabus :

Unit	Content	Hrs/Unit
1	Convergence of sequence and series, tests for convergence, power series, Taylor's series. Series for exponential, trigonometric and logarithmic functions.	8
2	Limit, continuity and partial derivatives, Chain rule, Implicit function, Jacobian, Directional derivatives, Total derivative; Maxima, minima and saddle points; Gradient, curl and divergence and related problems.	7
3	Double and triple integrals (Cartesian and polar), change of order of integration in double integrals, Change of variables (Cartesian to polar). Theorems of Green, Gauss and Stokes (Statement only) and related problems	8
4	First Order Differential Equation, Exact, Linear and Bernoulli's equations, Equations of first order but not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's form, general & singular solution. [5L] Second order linear differential equations with constant coefficients, D-operator method, method of variation of parameters, Cauchy-Euler equation. [4L]	9
5	Basic Concept of graph, Walk, Path Circuit, Euler and Hamiltonian graph, diagraph. Matrix Representation: Incidence & Adjacency matrix. Tree: Basic Concept of tree, Binary tree, Spanning Tree, KrusKal and Prim's algorithm for finding the minimal spanning tree.	8

Course Title:Economics for Engineers (Humanities-II)	**Code: HSMC 301**
Type of Course: Theory	**Course Designation: Compulsory**
Semester: 3rd	**Contact Hours: 3L/week**
Continuous Assessment: 25 Marks	**Final Exam: 70 Marks**
Writer: Course Coordinator	**Approved by HoD (convenor of DAB)**

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
HSMC 301.CO1	Understand major principles of economic analysis for decision making among alternative courses of action in engineering.	Understand	K2
HSMC 301.CO2	Apply economic principles to prices and quantities in competitive supply and demand for goods and for money.	Apply	K3
HSMC 301.CO3	Solve economic problems involving comparison and selection of alternatives by using analytical techniques including benefit-cost ratio and breakeven analysis.	Solve	K3
HSMC 301.CO4	Evaluate the effect of inflation,deflation and price change with indexes in Engineering Economic Analysis	Evaluate	K5
HSMC 301.CO5	Analyze the effect of uncertainty in economic analysis by using various concepts like expected value, estimates and simulation	Analyze	K4
HSMC 301.CO6	Understand the concepts of depreciation and replacement analysis andsolve associated problems	Understand	K2

Mapping of COs with POs and PSOs (Course Articulation Matrix):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2	-	2	-	1	-	-	3	1	1	1
CO2	2	2	2	2	-	2	-	1	-	-	3	1	1	1
CO3	2	2	2	2	-	2	-	1	-	-	3	1	1	1
CO4	2	2	2	2	-	2	-	1	-	-	3	1	1	1
CO5	2	2	2	2	-	2	-	1	-	-	3	1	1	1
CO6	2	2	2	2	-	2	-	1	-	-	3	1	1	1
AVG.	2	2	2	2	0	2	0	1	0	0	3	1	1	1

University Syllabus :

Unit	Content	Hrs/Unit
1	1. Economic Decisions Making – Overview, Problems, Role, Decision making process. 2. Engineering Costs & Estimation – Fixed, Variable, Marginal & Average Costs, Sunk Costs, Opportunity Costs, Recurring And Nonrecurring Costs, Incremental Costs, Cash Costs vs Book Costs, Life-Cycle Costs; Types Of Estimate, Estimating Models - PerUnit Model, Segmenting Model, Cost Indexes, Power-Sizing Model, Improvement & Learning Curve, Benefits.	9
2	3. Cash Flow, Interest and Equivalence: Cash Flow – Diagrams, Categories & Computation, Time Value of Money, Debt repayment, Nominal& Effective Interest. 4. Cash Flow & Rate of Return Analysis – Calculations, Treatment of Salvage Value, Annual Cash Flow Analysis, Analysis Periods; Internal Rate of Return, Calculating Rate of Return, Incremental Analysis; Best Alternative Choosing an Analysis Method, Future Worth Analysis, Benefit-Cost Ratio Analysis, Sensitivity and Breakeven Analysis. Economic Analysis In The Public Sector -Quantifying And Valuing Benefits & drawbacks.	9
3	5. Inflation and Price Change – Definition, Effects, Causes, Price Change with Indexes, Types of Index, Composite vs Commodity Indexes, Use of Price Indexes In Engineering Economic Analysis, Cash Flows that inflate at different Rates. 6. Present Worth Analysis: End-Of-Year Convention, Viewpoint Of Economic Analysis Studies, Borrowed Money Viewpoint, Effect Of Inflation & Deflation, Taxes, Economic Criteria, Applying Present Worth Techniques, Multiple Alternatives. 7. Uncertainty In Future Events - Estimates and Their Use in Economic Analysis, Range Of Estimates, Probability, Joint Probability Distributions, Expected Value, Economic Decision Trees, Risk, Risk vs Return, Simulation, Real Options.	9
4	8. Depreciation - Basic Aspects, Deterioration & Obsolescence, Depreciation And Expenses, Types Of Property, Depreciation Calculation Fundamentals, Depreciation And Capital Allowance Methods, Straight-Line Depreciation Declining Balance Depreciation, Common Elements Of Tax Regulations For Depreciation And Capital Allowances. 9. Replacement Analysis - Replacement Analysis Decision Map, Minimum Cost Life of a New Asset, Marginal Cost, Minimum Cost Life Problems. 10. Accounting – Function, Balance Sheet, Income Statement, Financial Ratios Capital Transactions, Cost Accounting, Direct and Indirect Costs, Indirect Cost Allocation.	9

SEMESTER – III
PRACTICAL

Course Title:Analog and Digital Electronics	**Code: ESC 391**
Type of Course: Practical	**Course Designation: Compulsory**
Semester: 3rd	**Contact Hours: 4P/week**
Continuous Assessment: 40 Marks	**Final Exam: 60 Marks**
Writer: Course Coordinator	**Approved by HoD (convenor of DAB)**

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ESC 391.CO1	Understand of the fundamental concepts and techniques used in digital electronics.	Understand	K2
ESC 391.CO2	Understand and examine the structure of various number systems and its application in digital design.	Understand	K2
ESC 391.CO3	Apply the basic requirements for a design application and propose a cost effective solution of various combinational circuits.	Apply	K3
ESC 391.CO4	Analyze basic requirements for a design application and propose a cost effective solution of various sequential circuits.	Analyze	K4
ESC 391.CO5	Identify and prevent various hazards and timing problems in a digital design for developing skill to build, and troubleshoot in digital circuits.	Identify	K3
ESC 391.CO6	Design and examine the structure of analog circuits and verify its operations.	Design	K6

Mapping of COs with POs and PSOs (Course Articulation Matrix):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	1	1	0	0	-	-	-	1	3	3	3
CO2	3	3	3	1	1	0	0	-	-	1	1	3	3	3
CO3	3	3	3	-	-	0	0	1	-	1	1	3	3	3
CO4	3	3	2	2	1	0	0	1	2	1	1	3	3	3
CO5	3	2	1	-	2	0	0	2	2	1	1	3	3	3
CO6	3	2	2	-	2	0	0	2	2	-	1	3	3	3
AVG.	3	2.67	2.33	1.33	1.4	0	0	1.5	2	1	1	3.00	3.00	3

University Syllabus :

Unit	Content
1	**Analog Electronics** 1 Design a Class A amplifier 2 Design a Phase-Shift Oscillator 3 Design of a Schmitt Trigger using 555 timer
2	**Digital Electronics** 4 Design a Full Adder using basic gates and verify its output / Design a Full Subtractor circuit using basic gates and verify its output.

	5 Construction of simple Decoder & Multiplexer circuits using logic gates. 6 Realization of RS / JK / D flip flops using logic gates 7 Design of Shift Register using J-K / D Flip Flop 8 Realization of Synchronous Up/Down counter 9 Design of MOD- N Counter 10 Study of DAC

Course Title:Data Structure & Algorithm Lab	**Code: PCC-CS391**
Type of Course: Practical	**Course Designation: Compulsory**
Semester: 3rd	**Contact Hours: 4P/week**
Continuous Assessment: 40 Marks	**Final Exam: 60 Marks**
Writer: Course Coordinator	**Approved by HoD (convenor of DAB)**

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS391.CO1	Construct algorithms from problems.	Construct	K3
PCC-CS391.CO2	Understand the basics of Stack, Queue.	Understand	K2
PCC-CS391.CO3	Categorize the necessarily of linked list and array implementation.	Categorize	K4
PCC-CS391.CO4	Learn the real life use of Tree and graph.	Learn	K3
PCC-CS391.CO5	Compare different shorting and searching methods.	Compare	K5
PCC-CS391.CO6	Understand the implementation mechanism of shorting and searching.	Understand	K2

Mapping of COs with POs and PSOs (Course Articulation Matrix):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	2	1	1	1	1	1	2	2	3	3
CO2	3	2	3	3	-	1	1	1	1	1	2	2	3	3
CO3	3	3	3	2	-	-	-	-	1	1	-	2	2	2
CO4	3	2	3	3	-	-	-	-	1	1	-	2	2	2
CO5	3	3	2	3	-	-	-	-	1	1	-	2	2	2
CO6	3	3	3	3	-	-	-	-	1	1	-	2	2	2
AVG.	3	2.67	2.83	2.83	2	1	1	1	1	1	2	2	2.33	2.33

University Syllabus :

Unit	Content
1	**Linear Data Structure** 1 Implementation of array operations 2 Stacks and Queues: adding, deleting elements Circular Queue: Adding & deleting elements 3 Merging Problem: Evaluation of expressions operations on Multiple stacks & queues: 4 Implementation of linked lists: inserting, deleting, inverting a linked list. Implementation of stacks & queues using linked lists 5 Polynomial addition, Polynomial multiplication
2	**Non Linear Data Structure** 6 Recursive and Non-recursive traversal of Trees 7 Threaded binary tree traversal. AVL tree implementation 8 Application of Trees. Application of sorting and searching algorithms 9 Hash tables implementation: searching, inserting and deleting, searching & sorting techniques.

Course Title:Computer Organization Lab	**Code: PCC-CS392**
Type of Course: Practical	**Course Designation: Compulsory**
Semester: 3rd	**Contact Hours: 4P/week**
Continuous Assessment: 40 Marks	**Final Exam: 60 Marks**
Writer: Course Coordinator	**Approved by HoD (convenor of DAB)**

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS392.CO1	Understand the behaviour of logic gates.	Understand	K2
PCC-CS392.CO2	Design combinational circuits for basic components of computer system and Applications.	Design	K6
PCC-CS392.CO3	Analyze the operational behaviour and applications of various flip-flop.	Analyze	K4
PCC-CS392.CO4	Implement Arithmetic logic units and different types of memory blocks.	Implement	K3
PCC-CS392.CO5	Design to cascade multiple RAM chips for vertical and horizontal expansion.	Design	K6
PCC-CS392.CO6	Implement Carry-Look-Ahead Adder and BCD adder circuit .	Implement	K3

Mapping of COs with POs and PSOs (Course Articulation Matrix):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	3	3	1	2	3	3	2	2	3	1
CO2	3	3	1	2	1		1	2	3	3	2	2	-	1
CO3	3	3	2	2	2	1	1	2	2	2	1	3	2	1
CO4	3	3	2	2	2	1	1	2	2	2	2	3	1	3
CO5	3	3	3	2	3	1	1	2	2	2	1	3	-	1
CO6	3	3	3	2	3		1	2	3	3	2	3	3	2
AVG.	3	3	2.33	2	2.3	1.5	1	2	2.5	2.5	1.67	2.67	2.25	1.5

University Syllabus :

Unit	Content
1	Familiarity with IC-chips: a) Multiplexer, b) Decoder, c) Encoder b) Comparator Truth Table verification and clarification from Data-book.
2	Design an Adder/Subtractor composite unit.
3	Design a BCD adder.
4	Design of a 'Carry-Look-Ahead' Adder circuit.
5	Use a multiplexer unit to design a composite ALU
6	Use ALU chip for multibit arithmetic operation
7	Implement read write operation using RAM IC
8	(a) & (b) Cascade two RAM ICs for vertical and horizontal expansion.

Course Title:IT Workshop	**Code: PCC-CS393**
Type of Course: Practical	**Course Designation: Compulsory**
Semester: 3rd	**Contact Hours: 4P/week**
Continuous Assessment: 40 Marks	**Final Exam: 60 Marks**
Writer: Course Coordinator	**Approved by HoD (convenor of DAB)**

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS393.CO1	Interpret the basic syntax of python variables,datatypes and operator in python and	Interpret	K2
PCC-CS393.CO2	Make use of conditional and control flow statement in python fluently.	Make use of	K3
PCC-CS393.CO3	Define the use of string and list datatype in proficiency level.	Define	K1
PCC-CS393.CO4	Discoverthe method to create and manipulation of python data structure like tuple and dictionary.	Discover	K4
PCC-CS393.CO5	Explain the use of python function and uses of different modules in python.	Explain	K5
PCC-CS393.CO6	Discuss the concepts of object oriented programming like exception handling.	Discuss	K6

Mapping of COs with POs and PSOs (Course Articulation Matrix):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	-	1	1	1	-	-	1	-	3	3	2
CO2	3	2	1	-	1	1	1	1	-	1	-	2	3	1
CO3	3	3	3	1	3	-	2	-	2	1	1	2	3	2
CO4	3	3	3	1	2	-	-	1	1	-	1	3	2	1
CO5	3	3	3	2	3	-	-	1	2	-	1	3	3	2
CO6	3	3	3	2	3	-	2	2	2	3	1	3	3	2
AVG.	3	2.83	2.5	1.5	2.17	1	1.5	1.25	1.75	1.5	1	2.67	2.83	1.67

University Syllabus :

Programming with Python

Unit	Content
1	Introduction History, Features, Setting up path, Working with Python, Basic Syntax, Variable and Data Types, Operator
2	Conditional Statements If, If- else, Nested if-else, Looping, For, While, Nested loops
3	Control Statements Break, Continue, Pass
4	String Manipulation Accessing Strings, Basic Operations, String slices, Function and Methods
5	Lists Introduction, Accessing list, Operations, Working with lists, Function and Methods
6	Tuple Introduction, Accessing tuples, Operations, Working, Functions and Methods
7	Dictionaries Introduction, Accessing values in dictionaries, Working with dictionaries, Properties
8	Functions Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables
9	Modules Importing module, Math module, Random module, Packages, Composition, Input-Output Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files, Functions
10	Exception Handling Exception, Exception Handling, Except clause, Try? finally clause, User Defined Exceptions.