

S.E. Semester –III

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2020) TCET Autonomy Scheme (w.e.f. A.Y. 2023-24)

B.E. (Information Technology)					S.E. SEM: III					
Course Name: Universal Human Values-II					Course Code: HSMC-301					
Teaching Scheme (Program Specific)					Examination Scheme (Academic)					
Modes of Teaching / Learning / Weightage					Modes of Continuous Assessment / Evaluation					
Hours Per Week					Theory (100)		Practical/Oral/ Presentation (25)	Term Work (25)	Total	
					40	60				
Theory	Tutorial	Practical	Contact Hours	Credits	IA		ESE	PR/OR	TW	
					ISE	IE				
2	1	-	4	4	20	20	60	-	25	125
IA: In-Semester Assessment - Paper Duration – 1 Hour ESE: End Semester Examination - Paper Duration – 2 Hours The weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely completion of practical (40%) and Attendance / Learning Attitude (20%)										
Prerequisite: Basic Mathematics										

Course Objective:

To provide a much needed orientational input in value education to the young enquiring minds

Course Outcomes: After the successful completion of the course, students will be able to:

SN	Course Outcomes	Cognitive Levels as per Blooms Taxonomy
1	To appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human being.	LI, L2, L3
2	To develop Holistic perspective towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence	LI, L2,L3,L4
3	To practise plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature.	LI, L2,L3,L4,L5,L6

Detailed Syllabus:

Module No.	Topics	Hrs	Cognitive Levels as per Blooms Taxonomy
1	Introduction to Value Education	6	LI,L2
	Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity — the Basic Human Aspirations, Right Understanding, Relationship and Physical Facility ,Happiness and Prosperity — Current Scenario, Method to Fulfill the Basic Human Aspirations		
2	Harmony in the Human Being	6	L I ,L2,L3
	Understanding Human being as the Co-existence of the Self and the Body, Distinguishing between the Needs of the Self and the Body, The Body as an Instrument of the Self, Understanding Harmony in the Self, Harmony of the Self with the Body , Programme to ensure self-regulation and Health		
3	Harmony in the Family and Society	6	L I ,L2,L3,

	Harmony in the Family — the Basic Unit of Human Interaction, Values in Human-to-Human Relationship, Trust' — the Foundational Value in Relationship, Respect' —as the Right Evaluation, Understanding Harmony in the Society, Vision for the Universal Human Order		L4
4	Harmony in the Nature/Existence	4	L I ,L2,L 3,L4
	Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, The Holistic Perception of Harmony in Existence		
5	Implications of the Holistic Understanding	3	L I ,L2,L 3,L4
	Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order		
6	Professional Ethics	3	L I ,L2,L3, L4,L5,L 6
	Competence in Professional Ethics, Holistic Technologies, Production Systems and Management Models-Typical Case Studies, Strategies for Transition towards Value- based Life and Profession		

Books and References:

S. No.	Title	Authors	Publisher	Edition	Year
1	Jeevan Vidya: EkParichaya,,	A Nagaraj	Jeevan Vidya Prakashan, Amarkantak,		1999
2	Human Values	A.N. Tripathi	New Age Intl. Publishers, NewDelhi,	-	2004
3	Small is Beautiful - E. FSchumacher	Sorab K. Gandhi	-	-	1973
4	Economy of Permanence	J C Kumarappa	Sarva Seva Sangh Prakashan	-	2017
5	India Wins Freedom	Maulana AbdulKalam Azad	Stosius Inc/Advent Books Division		1989
6	Vivekananda	Romain Rolland	Advaita Ashrama, India		2010
7	A Foundation Course in Human Values and Professional Ethics	R R Gaur, R Asthana, G PBagaria	Excel Books, New Delhi. ISBN 978-93-87034-47-1	2nd Revised Edition	2019

Online References:

S. No.	Website Name	URL
1	https://www.youtube.com	https://www.youtube.com/watch?v=PXSEpPFCn38

List of Tutorial:

Tutorial Number	Topic	Hrs.
1	Sharing about Oneself	1
2	Exploring Human Consciousness	1
3	Exploring Natural Acceptance	1
4	Exploring the difference of Needs of Self and Body	
5	Exploring Sources of Imagination in the Self	1
6	Exploring Harmony of Self with the Body	1

7	Exploring the Feeling of Trust	1
8	Exploring the Feeling of Respect	1
9	Exploring Systems to fulfil Human Goal	1
10	Exploring the Four Orders of Nature	1
11	Exploring Co-existence in Existence	1
12	Exploring Ethical Human Conduct	1
13	Exploring Humanistic Models in Education	1
14	Exploring Steps of Transition towards Universal Human Order	1
Total		15

Suggested Assessment for Term work :

The assessment is to provide a fair state of development of the student, so participation in classroom discussions, self-assessment, peer assessment etc. will be used in evaluation.

Example: Assessment by faculty mentor: 10 marks Self-assessment: 10 marks Assessment by peers: 10 marks Socially relevant project/Group Activities/Assignments: 20 marks

Semester End Examination: 50 marks , the overall pass percentage is 40%. In case the student fails, he/she must repeat the course.

S.E. Semester –III

**Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)
 Proposed TCET Autonomy Scheme (w.e.f. A.Y. 2023-24)**

B.E. (Information Technology)					S.E. SEM: III					
Course Name: Applied Mathematics-III					Course Code: BSC- IT301					
Teaching Scheme (Program Specific)					Examination Scheme (Academic)					
Modes of Teaching / Learning / Weightage					Modes of Continuous Assessment / Evaluation					
Hours Per Week					Theory (100)		Practical/Oral/ Presentation (25)	Term Work (25)	Total	
					40	60				
Theory	Tutorial	Practical	Contact Hours	Credits	IA		ESE	PR/OR	TW	
					ISE	IE				
3	1	-	4	4	20	20	60	-	25	125
IA: In-Semester Assessment - Paper Duration – 1 Hour										
ESE: End Semester Examination - Paper Duration – 2 Hours										
The weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely completion of practical (40%) and Attendance / Learning Attitude (20%)										
Prerequisite: Basic Mathematics										

Course Objectives: The objective of the course is to understand the discrete mathematical preliminaries and apply the knowledge of sets, relations, functions, graphs, lattices, logic and algebraic structures in formal representation of various computing constructs.

Course Outcomes: Students will be able to:

SN	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy	PO Mapping (Write only Number/s)	PSO Mapping (Write only Number/s)
1	Understand the basic concepts of set theory and able to apply basic set operations in problem solving.	L1, L2, L3	1,2,3,4	1,2
2	Understand relation and function and their properties and also able to understand their use in programming applications.	L2, L3	1,2,3,4	1,2
3	Understand Partially ordered set, lattice concept in various application.	L1, L2, L3	1,2,3,4,5	1,2
4	Understand the concept of graph, Euler graph, Hamiltonian graph and special kind of graph and also able to model real world problems using graph theory.	L1, L3	1,2,3,4,5	1,2
5	Develop an understanding of how to read and construct valid mathematical statements, arguments and understand mathematical statements.	L1, L3	1,2,3,4,5	1,2
6	Understand use of groups and codes in Encoding-Decoding and apply discrete structures into other computing problems such as formal specification, verification, artificial intelligence, cryptography, Data Analysis and Data Mining.	L1, L3	1,2,3,4,5	1,2

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	Introduction to Set Theory and Proofing Techniques	7	L1, L2, L3
	Definition of Sets, Venn Diagrams, complements, cartesian products, power sets, counting principle, cardinality and countability (Countable and Uncountable sets), Laws of set theory, Power set and Products Partitions of sets. The Principle of Inclusion and Exclusion Pigeonhole Principle		
2	Relation and Functions	7	L2, L3
	Relation: Definition, types of relation, composition of relations, pictorial representation of relation (Digraphs), properties of relation, partial ordering relation. Operations on relations, Closures, Warshall's algorithm. Function: Definition and types of function, composition of functions.		
3	Lattices	7	L1, L2, L3
	Posets, Hasse Diagram, chain, Upper bounds, Lower bounds, GLB & LUB of sets, Definition & properties of Lattice, sublattice Distributive & modular Lattices, complemented & bounded Lattices, Complete lattices.		
4	Graph Theory	8	L1, L3
	Definitions: graphs, digraphs, Multigraphs, Paths and cycles (Hamiltonian and Eulerian), Subgraphs, Isomorphism, Special kinds of graphs: bipartite graphs, planer graphs, Connected Graphs, trees.		
5	Logic	7	L1, L3
	Propositions and logical operations, Truth tables Equivalence, Implications Laws of logic, Normal Forms, Predicates and Quantifiers, Mathematical Induction		
6	Algebraic Structures	9	L1, L3
	Algebraic structures with one binary operation: semigroup, monoid and group, Abelian group, Cyclic groups, Homomorphism, Isomorphism, Field. Coding theory: Coding of binary information and error detection, decoding and error correction.		
Total Hours		45	

Books and References:

SN	Title	Authors	Publisher	Edition	Year
1	Elements of Discrete Mathematics	C. L. Liu and D. P. Mohapatra	McGraw Hill	2nd Edition	2010
2	Discrete Mathematical Structures with Applications to Computer Science	J. P. Trembley, R. Manohar	McGraw Hill	5th Edition	2011
3	Discrete Mathematics	Seymour Lipschutz, Marc Lars Lipson,“	McGraw Hill	5th Edition	2010
4	Advanced Engineering Mathematics	Erwin kreyszig	John Wiley & Sons	Ninth Edition	2006
5	Higher Engineering Mathematics	B.S. Grewal	Khanna Publishers	Thirty Sixth Edition	2010

List of Tutorials:

Sr. No	Topic	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	Tutorial on Set theory	1	L1, L2
2	Tutorial on Principle of Inclusion and Exclusion	1	L1, L2, L3
3	Tutorial on Pigeonhole Principle	1	L1, L2, L3
4	Tutorial on Relation	1	L1, L2
5	Tutorial on Warshall's Algorithm	1	L1, L2, L3
6	Tutorial on Functions	1	L1, L2
7	Tutorial on isomorphism	1	L1, L2, L3
8	Tutorial on poset, Hasse diagram	1	L1, L2
9	Tutorial on Lattice, Sublattice	1	L1, L2, L3
10	Tutorial on types of lattices	1	L1, L2, L3
11	Tutorial on planar graphs	1	L1, L2
12	Tutorial on Eulerian and Hamiltonian Graphs	1	L1, L2, L3
13	Tutorial on logic operations and truth tables equivalence	1	L1, L2
14	Tutorial on Normal Forms, Predicates and Quantifiers	1	L1, L2, L3
15	Tutorial on Algebraic structures with one binary operation	1	L1, L2, L3
	Total Hours	15	

S.E. Semester –III

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)
TCET Autonomy scheme with effect from 2023-24

B.E (Information Technology)					S.E. (SEM : III)					
Course Name :Digital Circuit Design					Course Code : ESC-IT 301					
Teaching Scheme (Program Specific)					Examination Scheme (Formative/ Summative)					
Modes of Teaching / Learning / Weightage					Modes of Continuous Assessment / Evaluation					
Hours Per Week					Theory (100)			Practical/Oral (25)	Term Work (25)	Total
Theory	Tutorial	Practical	Contact Hours	Credits	ISE	IE	ESE	OR	TW	150
3	-	2	5	4	20	20	60	25	25	
ISE: In-Semester Examination - Paper Duration – 1.5 Hours IE: Innovative Examination ESE: End Semester Examination - Paper Duration - 3 Hours The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)										
Prerequisite : Fundamentals of BJT and Logic signal levels.										

Course Objective: The course intends to deliver the fundamental knowledge of Digital logic, number system, conversions and Boolean algebra, apply and analyze the concept to create and troubleshoot a broad range of combinational circuits using digital ICs, flip-flops, counters, and registers. To prepare students to perform the analysis and design of various digital electronic circuits.

Course Outcomes: Upon completion of the course students will be able to:

Sr. No	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy	PO Mapping (Write only Number/s)	PSO Mapping (Write only Number/s)
1	Understand and develop a digital logic and apply it to solve real life problems.	L1,L2,L3,L4	1,2,3	2
2	Understand and apply of K-Map and Tabular method for simplification of logical expression.	L1, L2, L3	1,2,3,4,5	2
3	Using several methods to minimize the Boolean expression using Boolean algebra and design it using logic gates.	L1, L2, L3	1,2,3,4,5,11	2
4	Analysis and design of combinational and sequential circuit.	L1, L2, L3,L4	1,2,3,4,5,11,12	2
5	Understand and analyse the different shift register	L1, L2, L3,L4	1,2,3,4,5,9,11,12	2
6	Understand concept in designing of the counter	L1, L2	1,2,3,4,5,9,11,12	2

Detailed Syllabus (Total No. of Hours: 45)

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
0	Prerequisite	02	L1,L2
	Introduction to bipolar junction transistor and configurations, Representation of analog signal level in to digital signals through basic TTL circuits.		
01	Number Systems and codes	06	L1, L2, L3,L4
	Representation of signed numbers: fixed and floating point numbers, Introduction to Number systems, Binary Number systems, Signed, Binary Numbers, Binary, Octal, Decimal and Hexadecimal number, Systems and their conversion, Binary arithmetic using compliments, Gray Code, BCD Code, Excess-3 code, ASCII Code. inter-conversion of codes		
02	Logic Design and Minimization Techniques	07	L1, L2, L3
	Introduction to basic logic gates, Operations on NAND and NOR gates, XOR and X-NOR operations, understanding Boolean Algebra and its Standard representation of logic functions- SOP and POS forms. Min term and Max term. Don't care conditions. Simplification of logic functions-using Karnaugh Map (K-Map) for 2, 3 and 4 variables. Quine-McClusky Method, NAND,NOR Realization		
03	Combinational logic Circuit and design	06	L1, L2, L3
	Half- Adder, Full Adder, Half Subtractor or Full Sub tractor, BCD adder using and subtractor using IC 7483, Multiplexers (MUX): Working of MUX, Implementation of expression using MUX (IC 74153, Demultiplexers IC 74151). Demultiplexers (DEMUX):- Implementation of expression using DEMUX, Decoder (IC 74138)		
04	Latches and Flip-Flop	09	L1, L2, L3,L4
	Introduction: SR latch, Concepts of Flip Flops: SR, D, J-K, T, Truth Tables and Excitation Tables of all types, Race around condition, Master Slave JK Flip Flops, Timing Diagram, Flip-flop conversion		
05	Shift Register	06	L1, L2,L3,L4
	Registers-SISO, SIPO, PISO AND PIPO 4 –BIT REGISTER. Shift Register-Right shift, left shift and Bidirectional Register. Application of shift Register-Ring and Twisted Ring Counter.		
06	Counter	09	L1, L2
	Counters : Types of counters- Asynchronous and Synchronous .Up, Down and Up-Down Counters Asynchronous Counter-2,3 and 4 Bit Up ,down and Up/Down Counters. Synchronous Counter-2, 3 and 4 Bit Up, down and Up-Down Counters.		
Total Hrs.		45	

List of Practicals/Experiments:

Exp. No.	Category of Experiment	Practical/ Experiment Topic	Hrs	RBT Levels
1	Basic Experiments	Verify the truth table of logic gates (Basic and Universal Gates)	2	L1, L2
2		Realization of Boolean algebra using gates	2	L1, L2, L3
3		Design (truth table, K map) and implement 4 bit Code converter. Binary to gray and vice versa. ii. BCD to Excess-3 and vice versa	2	L1, L2, L3
4		Design of Half Adder and Subtractor.	2	L1, L2, L3,L4

5	Design Experiments	Realization of Boolean expression using multiplexer IC 4151/74153.	2	L1, L2, L3
6		To verify and observe the operation of JK and T flip-flops	2	L1, L2, L3
7		Implementation of Encoder and Decoder using Gates	2	L1, L2, L3,L4
8		Verify the operation of 4- bit magnitude comparator	2	L1, L2, L3
9	Advanced Experiments	To design SISO or SIPO shift registers	2	L1, L2, L3,L4
10		Design and implement 2-bit up counter.	2	
11		Design and implement 3-bit down counter.	2	L1, L2, L3,L4
12	Mini/Minor Projects/ Seminar/ Case Studies	Case study: To study Programmable logic devices (PLD)	2	L1, L2, L3,L4
13		Case study: Evaluating and observing Boolean expression using PALs and PLAs.	2	
14		Project: 1. To design automated system for washing machine. 2. To design control system for lift	4	
Total Hrs.			30	

Books and References:

Title	Authors	Publishers	Edition	Year
Modern Digital Electronics	R. P. Jain	Tata McGraw Hill	4 th	2009
Digital Logic and computer Design	M. Morris Mano	Pearson education India	4 th	2016
Fundamentals of Digital Circuits	A Anand Kumar	Prentice Hall India	2 nd	2009
Digital Electronics	Subrata Ghosal	Cengage Learning	1 st	2012
Digital Electronics Principles and Integrated Circuits	Anil K. Maini	Wiley India	1 st	2007

Online References:

Sr. No.	Website Name	URL	Modules Covered
1.	https://www.tutorialspoint.com	https://www.tutorialspoint.com/digital_circuits/digital_circuits_number_systems.htm	M1
2.	https://www.tutorialspoint.com	https://www.tutorialspoint.com/digital_circuits/digital_circuits_logic_gates.htm	M2
3.	https://www.tutorialspoint.com	https://www.tutorialspoint.com/digital_circuits/digital_combinational_circuits.htm	M3
4.	https://www.tutorialspoint.com	https://www.tutorialspoint.com/digital_circuits/digital_circuits_latches.htm	M4
5.	https://www.tutorialspoint.com	https://www.tutorialspoint.com/digital_circuits/digital_circuits_shift_registers.htm	M5
6.	https://www.tutorialspoint.com	https://www.tutorialspoint.com/digital_circuits/digital_circuits_counters.htm	M6

S.E. Semester –III
Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)
TCET Autonomy scheme with effect from 2023-24

B.E (Information Technology)					SEM : III				
Course Name: Data Structures & Algorithms					Course Code :PCC-IT 301				
Teaching Scheme (Program Specific)					Examination Scheme (Formative/ Summative)				
Modes of Teaching / Learning / Weightage					Modes of Continuous Assessment / Evaluation				
Hours Per Week					Theory (100)		Practical/ Oral (25)	Term Work (25)	Total
Theory	Tutorial	Practical	Contact Hours	Credits	IA		ESE	PR	TW
					ISE	IE			
3	1	2	6	5	20	20	60	25	25
ISE: In-Semester Examination - Paper Duration – 1 Hours IE: Innovative Examination ESE: End Semester Examination - Paper Duration - 2 Hours The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical and tutorial (40%) and Attendance/Learning Attitude (20%)									
Prerequisite: C Programming Language RBT: Revised Bloom’s Taxonomy									

Course Objective: The course intends to deliver the fundamentals of data structures and analysis of various algorithms by providing a platform to learn, compare and apply different data structures in real world scenario.

Course Outcomes: Upon completion of the course students will be able to:

S. No	Course Outcomes	Cognitive levels of attainment as per Bloom’s Taxonomy	PO Mapping (Write only Numbers)	PSO Mapping (Write only Numbers)
1	Understand and analyse various data structures data structures and the need of data structures.	L1, L2, L3,L4,L5	1,2,3,4,11,12	1,2,3
2	Apply Appropriate sorting and searching technique to specified problem definition.	L1, L2, L3	1,2,3,4,11,12	1,2,3
3	Implement various linked operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures to solve problems	L1, L2, L3, L4, L5	1,2,3,4,11,12	1,2,3
4	Develop the stack and queue based programs to understand working principles and applications.	L1, L2, L3, L4, L5	1,2,3,4,11,12	1,2,3
5	Evaluate and analyse the operations and applications of tree data structures	L1, L2, L3	1,2,3,4,11,12	1,2,3
6	Evaluate and analyse the operations, algorithms and applications of graph data structures	L1, L2, L3	1,2,3,4,11,12	1,2,3

Detailed Syllabus (Total No. of Hours: 45):

Module No.	Topics	Hrs	Cognitive levels of attainment as per Bloom's Taxonomy
01	Introduction to Data Structure and Algorithms	4	L1, L2, L3,L4, L5
	Introduction to Data Structures, Need of Data structures, ADT, ADT structure, Linear and Nonlinear Data structure, Introduction to Analysis of Algorithms: Properties of an Algorithm, Complexity analysis techniques, Recursion: Advantages & Disadvantages, Applications		
02	Searching and Sorting Techniques	8	L1, L2, L3
	Introduction to Searching: Linear search, Binary search Introduction to Sorting: Selection Sort, Insertion Sort, Quick Sort, Merge Sort, Radix Sort. Complexity Analysis of searching and sorting techniques. Case study: Store pixel values for manipulation and analysis of images using Arrays		
03	Linked List	10	L1, L2, L3,L4,L5
	Linked List as an ADT, Difference between Linked list & Arrays, Linked list operations - searching, insertion, and deletion, traversing, Memory Allocation & De-allocation of Linked list, Singly Linked list, Doubly Linked list, Circular linked list, Application of linked list.- Music and Video Player Playlists		
04	Stack and Queue	10	L1, L2, L3,L4,L5
	Introduction to Stack, Stack as ADT, Operations on stack – PUSH, POP, traversing, Stack implementation using array and Linked List, Polish notations, Applications of stack- Arithmetic expression evaluation, Infix, prefix, Postfix notations and conversions. Introduction to Queue, Queue as ADT, Operations on Queue: ENQUEUE, DEQUEUE, Queue implementation using array and Linked List, Linear Queue and Circular queue, Priority Queue, De-queue, Application of Queues		
05	Tree	08	L1, L2, L3
	Tree: Introduction to Trees, Tree terminology, Types of Trees, Binary tree representation, Operations on binary tree, Traversal of binary tree, Binary search tree, Expression tree, Threaded Binary Tree. Application of Trees - file system structure of an operating system		
06	Graph	05	L1, L2, L3
	Graph: Introduction to Graph, Graph terminology, Graph Representation- Matrix and adjacency list, Graph traversal: Depth first search(DFS) and Breadth First search(BFS), Minimum Spanning Tree: Prim's & Kruskal's, Application of Graphs, Case study on graph data structures - social media analysis, route planning		
Total Hrs.		45	

List of Practical's / Experiments:

Exper iment No.	Category of Experiment	Practical/ Experiment Topic	H rs.	RBT Levels Cognitive levels of attainment as per Bloom's Taxonomy
1	Basic Experiments (Based on measurements of properties)	Implement Linear and Binary Search Techniques	2	L1, L2, L3
2		Implement Selection and insertion sort.	2	L1, L2, L3
3		Implement Quick Sort and Merge sort	4	L1, L2, L3
4	Advance Experiments (Based on Volumetric Analysis)	Implement Singly Linked List and different Operations on it	2	L1, L2, L3
5		Implementation of Doubly Linked list and different Operations on it	2	L1, L2, L3,L4
6		Implementation of Stack using array and Linked List.	2	L1, L2, L3,L4
7		Implementation of Linear Queue using array and Linked List.	2	L1, L2, L3,L4
8		Implementation of Circular and Priority Queue.	2	L1, L2, L3,L4
9		Implementation of Binary Search Tree with insertion, deletion and Traversal operations.	2	L1, L2, L3,L4
10		Implementation of Graph Traversal Techniques: DFS & BFS	2	L1, L2, L3,L4
11	Design Based Experiments	a) Develop the code on Stack Application b) Develop the code for job scheduling using Queue based operation	4	L1, L2, L3,L4
12	Project Based Experiments- Group Activity) (Students should complete any one project Based experiment from the list or any other project in discussion with Faculty in- Charge)	Mini Project: Design Application of Data Structure & its implementation.	4	L1, L2, L3,L4
Total			30	

List of Tutorials:

Tutorial No.	Tutorial Topic	Hrs.	RBT Levels Cognitive levels of attainment as per Bloom's Taxonomy
1	Linear and Binary Search Techniques.	2	L1, L2, L3
2	Sorting Techniques.	2	L1, L2, L3
3	Sorting Techniques.	2	L1, L2, L3
4	Linked List and different operations on it	1	L1, L2, L3

5	Circular Linked list and different Operations on it	1	L1, L2, L3
6	Stack Applications	1	L1, L2, L3,L4
7	Queue Applications	1	L1, L2, L3,L4
8	Circular and Priority Queue.	2	L1, L2, L3,L4
9	Expression tree, Threaded Binary Tree	1	L1, L2, L3,L4
10	Minimum Spanning Tree: Prim's & Kruskal's Algorithm	2	L1, L2, L3,L4
Total		15	

Books and References:

S. No	Title	Authors	Publisher	Edition	Year
1	Data structures using C	Tenenbaum, Langsam, Augenstein	Pearson	Second	2015
2	Data Structures using C	Reema Thareja	Oxford	Second	2015
3	C and Data structures	P. S. Deshpande , O. G. Kakde	Dreamtech Press.	Third	2010
4	ALGORITHMS Design and Analysis	Harsh Bhasin	OXFORD	First	2015
5	Computer Algorithms	Ellis Horowitz and Sartaj Sahni,	Universities Press	First	2008
6	Data Structures and Algorithms in C++	Roberto Tamassia, Michael T. Goodrich	Wiley	Second	2011

Online References:

S. No.	Website Name	URL	Modules Covered
1.	NPTEL	https://nptel.ac.in/courses/106103069	M1
2.	NPTEL	https://archive.nptel.ac.in/courses/106/106/106106131/	M2
3.	NPTEL	http://digimat.in/nptel/courses/video/106106130/L07.html	M3
4.	NPTEL	https://archive.nptel.ac.in/courses/106/106/106106130/	M4
5.	NPTEL	https://archive.nptel.ac.in/courses/106/102/106102064/	M5
6.	NPTEL	https://archive.nptel.ac.in/courses/106/106/106106130/	M6

S.E. Semester –III

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME2020)
 TCET Autonomy scheme with effect from 2022-23

B.E (Information Technology)					SEM: III					
Course Name :Database Management System					Course Code: PCC-IT 302					
Teaching Scheme (Program Specific)					Examination Scheme (Formative/ Summative)					
Modes of Teaching / Learning / Weightage					Modes of Continuous Assessment / Evaluation					
Hours Per Week					Theory (100)			Practical/ Oral (25)	Term Work (25)	Total
Theory	Tutorial	Practical	Contact Hours	Credits	ISE	IE	ESE	PR	TW	150
3	-	2	5	4	20	20	60	25	25	
ISE: In-Semester Examination - Paper Duration – 1 Hours IE: Innovative Examination ESE: End Semester Examination - Paper Duration - 2 Hours The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%) Prerequisite: Fundamentals of computer programming RBT: Revised Bloom's Taxonomy										

Course Objective: The course intends to deliver the fundamental knowledge of Database & Database Management System. To provide good formal foundation on the Entity Relationship Model, the relational model of data and usage of Relational Algebra and basic SQL as a universal Database language. To demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization and to introduce advanced concepts of transaction management and recovery techniques and query tuning.

Course Outcomes: Upon completion of the course students will be able to:

S. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy	PO Mapping (Write only Number/s)	PSO Mapping (Write only Number/s)
1	Define & Explain the features & functions of Database Management Systems and Relational Database	L1,L2	1,2,3	2
2	Analyze database models & entity relationship models.	L1,L2,L3,L4,L5, L6	1,2,3,4,5	2
3	Construct queries in Relational Algebra, create a RDBMS for a real life application, with constraints and keys using SQL. Analyze the performance of sql queries and can able to identify optimum query.	L1,L2,L3	1,2,3,4,5,11	2
4	Apply various techniques for securing Database and Backup & Recovery	L1,L2,L3,L4	1,2,3,4,5,11,12	2
5	Analyze the existing design of a database schema and apply concepts of normalization to design an optimal database.	L1,L2,L3	1,2,3,4,5,9,11,12	2
6	Explain and understand the concept of a transaction and how ACID properties are maintained when concurrent transaction occurs in a database	L2,L3,L4	1,2,3,4,5,9,11,12	2

Detailed Syllabus (Total No. of Hours: 45):

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
0	Prerequisite Basic knowledge of operating systems and file systems, Any programming Language	02	L1,L2
01	Introduction to Database Concepts Introduction, Purpose of Database System- Database System Terminologies, Database characteristics ,File system V/s Database system, Users of a Database System, Data Models, Schemas, and Instances, Three-Schema Architecture and Data Independence, Database Administrator (DBA), Role of a DBA.	06	L1, L2,
02	Entity– Relationship Data Model Conceptual Modelling of a database, The Entity-Relationship (ER) Model, Components of E-R Model , Entity Types, Entity Sets, Attributes, and Keys, Relationship Types, Relationship Sets, Weak Entity Types Generalization, Specialization and Aggregation, Extended Entity Relationship (EER) Model.	06	L1, L2, L3, L4,L5, L6
03	Relational Model And SQL Overview Relational model concepts, Constraints, converting E-R diagram into Relational Model Relational Algebra: Basic Operations-Selection, projection, Complex Operations- Cartesian product, Join, Set operations SQL: Characteristics of SQL, SQL data types, SQL Constraints ,Data Definition Language, Data Manipulation Language, Aggregate Functions, Group by, Order by, Nested sub queries, complex queries, Stored procedures and triggers	09	L1, L2, L3
04	Database Security and Backup & Recovery	08	L1, L2, L3
	User Access and Security: Types of Authentication, Creating SQL logins and testing logins, Setting authentication mode. Data Control Language, Creating and modifying use accounts, creating and using roles, granting and revoking privileges, Identify and fix the orphaned users Managing Views: Creating and modifying views, using views, Inserting, Updating and deleting data through views Database Snapshots: Create and Drop Snapshots , Restore data from Database Snapshot Recovery Model- Simple , Full and BULK_Logged Database backups, Backup types - Full, Differential, Transaction		
05	Relational Database Design Design guidelines for relational schema, Functional Dependencies, Definition of Normal Forms- 1NF, 2NF, 3NF, BCNF, Converting Relational Schema to higher normal forms.	07	L1, L2, L3,L4
06	Transactions Management Concurrency and Recovery	07	L1, L2,L3

	Transaction Concepts, Transaction state, ACID properties, testing of serializability, serializability of schedules, conflict & view serializable schedule, Recovery system: recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling. Transaction Control Language Concurrency control: Lock based, Timestamp based, validation based protocol, Deadlock Handling		
	Total Hrs.	45	

List of Practicals/Experiments:

New

S r. N o.	Type of Experiment	Title of Experiment	Total Hours	Cognitive levels of attainment as per Bloom's Taxonomy
1	Basic Experiments	Construct an Entity Relationship (ER) diagram for a given case study	2	L1,L2
2		Write Relational Algebra queries for a given case study	2	L1,L2
3	Design Experiments	Implementation of Data Definition Commands with Constraints.	2	L1,L2,L3
4		Implementation of Data Manipulation Commands and Data Control Commands	2	L1,L2,L3
5		Implementation of Join Queries and Nested Queries	2	L1,L2,L3
6		Implementation of Stored Procedure and triggers	2	L1,L2,L3
8		Implementation of database security techniques	2	L1,L2,L3
9	Advanced Experiments	Implementation of database backup and Recovery	2	L1,L2,L3
10		Implementation of Transaction Control Commands	4	L1, L2, L3, L4
11	Mini/Minor Projects/ Seminar/ Case Studies	Design a Mini Project for a given case study	10	L1,L2,L3,L4
		Total Hrs.	30	

Books and References:

S.N O.	Title	Authors	Publishers	Edition	Year
1	Database System Concepts	Korth, Silberchatz, Sudarshan	McGraw – Hill	6th Edition	2012
2	Fundamentals of Database Systems	Elmasri and Navathe	Pearson Education	6th Edition	2014
3	Database Management Systems	G. K. Gupta	McGraw – Hill	6th Edition	2011
4	An Introduction To Database Systems	C. J. Date, A. Kannan, S. Swamynathan	Pearson Education	8th Edition	2007

	Database System Concepts	Korth, Silberchatz, Sudarshan	McGraw – Hill	6th Edition	2012
--	--------------------------	----------------------------------	---------------	----------------	------

Online References:

S. No.	Website Name	URL	Modules Covered
1	https://www.tutorialspoint.com/	https://www.tutorialspoint.com/dbms/dbms_overview.htm , https://www.tutorialspoint.com/dbms/dbms_architecture.htm https://www.tutorialspoint.com/dbms/dbms_data_models.htm	M1
2	https://www.tutorialspoint.com/	https://www.tutorialspoint.com/dbms/er_model_basic_concepts.htm https://www.tutorialspoint.com/dbms/dbms_generalization_aggregation.htm	M2
3	https://www.tutorialspoint.com/	https://www.tutorialspoint.com/dbms/relational_data_model.htm https://www.tutorialspoint.com/dbms/sql_overview.htm	M3
4	https://www.tutorialspoint.com/	https://www.tutorialspoint.com/Database-Backup-and-Recovery	M4
5	https://www.tutorialspoint.com/	https://www.tutorialspoint.com/dbms/database_normalization.htm	M5
6	https://www.tutorialspoint.com/	https://www.tutorialspoint.com/dbms/dbms_transaction.htm https://www.tutorialspoint.com/dbms/dbms_concurrency_control.htm	M6

S.E. Semester – III

Choice Based Credit Grading Scheme with Holistic Multidisciplinary Education (CBCGS-HME-2023)

B. E. Information Technology					S.E. (SEM: III)					
Course Name: Attitude and Aptitude Development- III					Course Code: MC301					
Teaching Scheme (Program Specific)					Examination Scheme (Formative/ Summative)					
Modes of Teaching / Learning / Weightage					Modes of Continuous Assessment/ Evaluation					
Hours Per Week					Theory		Practical/ Oral	Term Work	Total	
Theory	Tutorial	Practical	Contact Hours	Credits	IA	ESE	PR	TW	25	
1	-	-	1	Non-Credit	Passing is mandatory for this course			25		
AC- Activity Evaluation/ Term work based on presentation Total weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely Completion of Practical (40%) and Attendance/ Learning Attitude (20%)										
Pre-requisite: Logical and analytical abilities, English Language skills, positive outlook										

Course Objective: The course aims to impart aptitude skills which will develop students' logical, analytical, and reasoning skills. Moreover, it also focuses on developing a positive outlook which will carve out a charismatic personality with ethics and etiquette required at personal and professional life.

Course Outcomes: Upon completion of the course students will be able to:

S. No.	Course Outcomes	Cognitive levels of attainment as per Revised Bloom's Taxonomy
1	Develop personality traits to become a charismatic personality	L1, L2, L3
2	Understand various leadership styles, develop, and use leadership qualities as per the situations	L1, L2, L3
3	Understand the hiring process and prepare themselves for the recruitment process	L1, L2, L3
4	Develop quantitative aptitude by using tactics, shortcuts, etc	L1, L2, L3, L4
5	Enhance reasoning skills through observations, tricks, and practice	L1, L2, L3, L4
6	Develop verbal reasoning skills with quick shortcuts	L1, L2, L3

Detailed Syllabus:

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Revised Bloom's Taxonomy
1	Personality	2	L1, L2, L3
	The Personality Attribute of Taking Bold Decisions, Types of Personality, Five-factor Inventory, Empiricists and Rationalists, The Big Five personality traits.		
2	Leadership Skills		L1, L2, L3

	The Concept, Types of Leaders, Leadership styles, Situational and Contingency theories, and Ontological-phenomenological model of leadership	2	
3	Pre-Hire Assessment	2	L1, L2, L3
	The concept, Types, Process, Pre-hire assessment tools, prejudices, Responsibilities of the candidates, Introduction to professional ethics		
4	Quantitative Aptitude	4	L1, L2, L3, L4
	Permutations & Combinations, Probability, Mensuration, Data Interpretation, Basics of Trigonometry, Coordinate Geometry		
5	Reasoning Aptitude	3	L1, L2, L3, L4
	Inferences, Arguments, Probability, Data Sufficiency, Seating Arrangements, Sequencing & Ordering, Scheduling, Puzzles, Data Interpretation, Venn Diagram		
6	Verbal Aptitude	2	L1, L2, L3
	Reading Comprehension, Closet Test, Error Detection, Idioms and Phrases, Critical Reasoning, one-word substitution		
Total Hrs.		15	

Books and References:

SN	Title	Authors	Publisher	Edition	Year
1.	Quantitative Aptitude for Competitive Examinations	Dr. R.S. Aggarwal	S. Chand	2022 nd Edition	2022
2	A Modern Approach to Verbal & Non-Verbal Reasoning	Dr. R.S. Aggarwal	S. Chand	2 nd Edition	2018
3	A Modern Approach to Logical Reasoning	Dr. R.S. Aggarwal	S. Chand	2022 nd Edition	2022
4	Puzzles to Puzzle You	Shakuntala Devi	Orient Paperbacks	-	2005

Online References:

S. No.	Website Name	URL	Modules Covered
1	Practice Aptitude Tests	https://www.practiceaptitudetests.com/?msclkid=427f71c485311d3df786154c3006c155&utm_source=bing&utm_medium=cpc&utm_campaign=Brand%20Global&utm_term=Practice%20Aptitude%20Tests&utm_content=_B_Exact	M4, M5

2	Quantitative Aptitude Tutorials	https://www.youtube.com/playlist?list=PLpyc33gOcbVA4qXMoQ5vmhefTruk5t9lt	M4
3	Spatial Reasoning Test	https://www.testgorilla.com/test-library/cognitive-ability-tests/spatial-reasoning-test/?utm_term=verbal%20reasoning%20for%20aptitude%20test&utm_campaign=&utm_source=bing&utm_medium=cpc&hsa_acc=4932434860&hsa_campaign=407261470&hsa_grp=1355698998617911&hsa_ad=&hsa_src=o&hsa_tgt=keyword-84732378233231&hsa_kw=verbal%20reasoning%20for%20aptitude%20test&hsa_mt=b&hsa_net=bing&hsa_ver=3&msclkid=ef084e72adf410827bed2afa1849c514&utm_content=Reasoning	M6
4	Personality Types	https://www.16personalities.com/personality-types	M1
5	Ted Talk	https://www.ted.com/topics/leadership	M2
6	Randstad-Pre-Hire Assessment	https://www.randstad.in/hr-news/recruitment/7-pre-hire-assessment-tools-you-should-be-aware/	M3

S.E. Semester - III

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2020)

TCET Autonomy scheme with effect from 2022-23

B. E. Information Technology					S.E. SEM: III		
Course Name: Summer Internship					Course Code: SI-IT301		
Contact Hrs. during Weekend / Semester Break/ End of Semester (Between 21st and 25th Week)					Assessment/Evaluation Scheme		
Theory	AC	Practical	Contact Hours	Credits	Presentation	Report	TW
-	-	-	120*	-	-	-	-
<p align="center">AC- Activity evaluation TW – Term Work Examination</p> <p>* This is part of Summer Internship but can start in winter. Students may go up to 160 hrs. to acquire maximum 4 credits in Semester 4.</p> <p>Total hrs. mentioned should be completed till end of Semester 4. Credits will be awarded at the end of 4th Semester and will be reflected in the Grade Card of 4th Semester.</p>							
Prerequisite: Fundamental knowledge of Information Technology related tools							

Course Objectives:

To get industry like exposure in the college laboratories by carrying out projects using subject studied till 4th semester. Also design innovative techniques / methods to develop the products. To gain knowledge of marketing and publicizing products developed.

Course Outcomes: Upon completion of the course students will be able to:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	To apply subject's knowledge in the college laboratories for carrying out projects	L1, L2,L3
2	Able to developed innovative techniques / methods to develop the products	L1, L2,L3
3	Able to do marketing and publicity of products developed	L1, L2,L3

Detailed Syllabus:

Module No.	Topics	Cognitive levels of attainment as per Bloom's Taxonomy
1	Program Specific Internship	L1, L2, L3
	Training and certification on emerging technologies in domains offered by Department of Computer Engineering Applying classroom and laboratory knowledge to design, develop and deploy the products	
2	Inter disciplinary Internship	L1, L2, L3
	<ul style="list-style-type: none"> To explore and understand issues and challenges in the other disciplines (E&TC, ELEX, MECH and CIVIL) Design , develop and deploy cost effective products using multidisciplinary approach 	

3	Industry Specific Internship	L1, L2, L3
	<ul style="list-style-type: none"> • To explore and understand issues and challenges in industry • Developing solutions for industry specific problems • Design , develop and deploy products for startup and SMEs 	
4	Interpersonal Internship	L1, L2, L3
	<ul style="list-style-type: none"> • To develop interpersonal skills such as leadership, marketing, publicity and corporate ethics and communication • To get competence in problem solving , presentation , negotiation skills 	
5	Social Internship	L1, L2, L3
	<ul style="list-style-type: none"> • Identify and study different real life issues in the society • Identify societal problems and provide engineering solutions to solve these problems 	
6	Academic Internship	L1, L2, L3
	<ul style="list-style-type: none"> • Study report preparation, preparation of presentations, copy table book preparation , business proposal and IPR • Capture aspirations & expectations through interviews of students. • Ways to connect research in technical institutes with industry. • Taking inputs from self, local stakeholders and global stakeholders which will help to develop process with comparative and competitive study. 	

Books and References:

Sr. No.	Title	Authors	Publisher	Edition	Year
1	The Ultimate Guide to Internships: 100 Steps to Get a Great Internship and Thrive in It (Ultimate Guides)	Eric Woodard	Allworth	First	2015

Online References:

Sr. No.	Website Name	URL	Modules Covered
1	https://www.letsintern.com/	https://www.letsintern.com/internships/summer-internships	M1-M6
2	https://codegnan.com	https://codegnan.com/blog/benefits-of-internships-and-importance	M1-M6
3	https://www.honorsociety.org	https://www.honorsociety.org/articles?category=internships	M1-M6

S.E. Semester –III
Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)
Proposed TCET Autonomy Syllabus (w.e.f. A.Y. 2023-2024)

B.E. (Information Technology)					S.E. SEM : III			
Course Name : Professional Skills I (Dept Specific Skill - Cloud Infrastructure Analyst I)					Course Code : HME -ITS301			
Teaching Scheme (Program Specific)					Examination Scheme (Academic)			
Modes of Teaching / Learning / Weightage					Modes of Continuous Assessment / Evaluation			
Theory	Tutorial	Practical	Contact Hours	Credits	Presentation	Report	TW	25
					AC	AC		
-	-	2	2	1	15	10	25	
The weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely completion of practical (40%) and Attendance / Learning Attitude (20%)								
Prerequisite: Computer Basics, Procedural Programming Languages, Infrastructure Security								

- Note:-** Individuals in this role are responsible for provisioning, deploying, and migrating infrastructure required for cloud implementation. Cloud Infrastructure Analysts automate the infrastructure provisioning process and maintain and secure the resources deployed on cloud.

Course Objective: Maintain compute, network and storage systems deployed on cloud and ensure backups and recovery

Course Outcomes: Upon completion of the course students will be able to:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy	PO Mapping (Write only Number/s)	PSO Mapping (Write only Number/s)
1	Understand cloud computing system with its features.	L1, L2	1-6,8-12	2,3
2	Demonstrate deployment & Launch of EC2 instance	L1, L2, L3	1-6,8-12	2,3
3	Create Amazon Simple Storage Service (S3) Bucket	L1-L6	1-6,8-12	2,3
4	Create AWS Lambda and API gateway	L1-L6	1-6,8-12	2,3
5	Analysis of AWS Elastic load balancing	L1, L2, L3,L4	1-6,8-12	2,3
6	Study and Analysis of auto scaling	L1, L2, L3, L4	1-6,8-12	2,3

List of Experiments:

Sr. No.	Practical/Experiment topic	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	Case study various available cloud computing system with its features.	2	L1, L2
2	Demonstrate deployment of EC2 instance as per requirement.	2	L2, L3
3	Launch EC2 Instance with multiple EBS Volumes Attached and analysis it.	2	L2, L3
4	Launch a Spot Instance with amazon EC2	2	L2, L3
5	Create AWS Lamda function	2	L2, L3
6	Create Dynamo DB tables and working with Queries	2	L2, L3
7	Create Amazon Simple Storage Service (S3) Bucket and upload files in it and create different versions of it	2	L2, L3, L4
8	Create AWS Lambda and API gateway to POST form data and insert in DynamoDb table	2	L2, L3,L4
9	Create a static website using amazon S3.	2	L2, L3, L4
10	Creating a Simple Bot with Lex	2	L2, L3, L4,L5
11	Study and analysis of AWS Elastic load balancing	2	L2, L3, L4,L5
12	Demonstrate Amazon EC2 Backup and Restore Using AWS Backup	2	L2, L3, L4,L5
13	Demonstrate security protocol across deployed cloud system	2	L2, L3, L4,L5
14	Study and Analysis of auto scaling in cloud computing	2	L2, L3, L4,L5
15	Case study on CloudWatch for Resource Monitoring.	2	L2, L3, L4,L5
Total Hrs.		30	

Online References:

Sr. No.	Website Name	URL	Practicals
1	www.nqr.gov.in	https://nqr.gov.in/qualification-title?nid=6473	1-15

S.E. Semester –III

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)

Proposed TCET Autonomy Syllabus (w.e.f. A.Y. 2023-2024)

B.E. (Information Technology)					S.E. SEM : III			
Course Name : Industry Practice-I (Employability Skills) (HTML & CSS)					Course Code : HME -IP301			
Teaching Scheme (Program Specific)					Examination Scheme (Academic)			
Modes of Teaching / Learning / Weightage					Modes of Continuous Assessment / Evaluation			
Theory	Tutorial	Practical	Contact Hours	Credits	Presentation	Report	TW	25
					AC	AC		
-	-	2	2	1	15	10	25	
The weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely completion of practical (40%) and Attendance / Learning Attitude (20%)								
Prerequisite: Computer Basics, Procedural Programming Languages								

Note:- IP Syllabus is Design Looking into the Current Market Scenario & Industry Trends. In Future Contents may be revised based on Industry Requirements.

Course Objective: The course intends to make students learn how to make applications in HTML & CSS. The course intends to develop expert level skills necessary for becoming technically skilled personnel.

Course Outcomes: Upon completion of the course students will be able to:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy	PO Mapping (Write only Number/s)	PSO Mapping (Write only Number/s)
1	Understand CLI Basic and shell programming	L1, L2	1-6,8-12	1
2	Understand concept of GIT VCS software designed	L1, L2, L3	1-6,8-12	1,2
3	Implement web services using HTML	L1, L2, L3	1-6,8-12	1,3
4	Comprehend concepts of application HTML Document Object Model	L1, L2	1-6,8-12	1,2,3
5	Comprehend concepts of CSS Basic and Framework .	L1, L2, L3	1-6,8-12	1,2,3
6	Implement Different Types of Hosting	L1, L2, L3, L4	1-6,8-12	1,2,3

Detailed Syllabus:

Module No.	Topics	Hrs.	Self Study	Cognitive levels of attainment as per Bloom's Taxonomy
1	CLI Basic	05	2	L1, L2
	Introduction to Command Line Interface (shell-based, package managers, containerization, build tools). Running CLI commands for file system navigation and management, file operations, permissions, shell scripting, etc.			
2	GIT VCS	05	3	L1, L2, L3
	Introduction to Version Control, Git basics, Installation and Configuration, Creating a repository, Committing changes, Branching and Merging, Resolving Conflicts, Git Branching Workflows.			
3	HTML	05	2	L1, L2, L3
	Introduction to HTML5, HTML Tags and Elements, Forms, Multimedia, HTML Attributes, Meta Tags, Best Practices and Optimization			
4	DOM	05	2	L1, L2
	HTML Document Object Model: The Tree Structure, Semantic HTML, Accessing and Manipulating Elements, Dynamic Updates, Cross-Language Integration			
5	CSS	05	3	L1, L2, L3
	CSS Syntax, Selectors, Properties, The Box Model: Box Shadow, Gradient, and Transitions. Layout Techniques, Selectors Specificity, CSS Frameworks: Bootstrap, Tailwind CSS			
6	Hosting	05	3	L1, L2, L3, L4
	Types of Hosting: VPS, dedicated servers, Cloud. Domain names and DNS, Web Servers, Deployment Methods, Database Hosting, Scalability and Load Balancing			
Total Hours		30	15	

Text /Reference Books:

Sr. No.	Title	Authors	Publisher	Year
1	HTML and CSS: Design and Build Websites	Jon Duckett	Wiley,	2011
2	Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics	Jennifer Niederst Robbins	O'Reilly Media,	2018
3	"HTML5 for Web Designers	Jeremy Keith and Rachel Andrew	A Book Apart,	2010
4	HTML and CSS: Visual QuickStart Guide	Elizabeth Castro	Peachpit Press,	2013
5	HTML & CSS: The Good Parts	Ben Henick	O'Reilly Media,	2010

6	Head First HTML and CSS	Elisabeth Robson and Eric Freeman	O'Reilly Media,	2012
---	-------------------------	-----------------------------------	-----------------	------

Online References:

Sr. No.	Website Name	URL	ModulesCovered
1	www.geeksforgeeks.org	https://www.geeksforgeeks.org/html/	M1-M5
2	www.w3schools.com	https://www.w3schools.com/html/default.asp	M3,M4
3	www.w3schools.com	https://www.w3schools.com/css/default.a sp	M5
4	www.hostinger.com	https://www.hostinger.com/tutorials/vps	M6