DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY CIRCULAR NO.SU/Engg./S.Y.B.Tech./02/2017

It is hereby informed to all concerned that, the syllabi prepared by the Committees & recommended by the Dean, Faulty of Science & Technology, the Academic Council at its meeting held on 20 & 21 June 2017 has accepted the following syllabi in accordance with Choice Based Credits & Grading System for all Branches S.Y.B.Tech under the Faulty of Science & Technology as enclosed herewith.

Sr.No.	Syllabi as per CBC & GS
[1]	Second Year B.Tech.[Civil Engineering],
[2]	Second Year B.Tech. [Mechanical Engineering],
[3]	Second Year B.Tech. [Agricultural Engineering],
[4]	Second Year B.Tech.[Electrical Engineering],
[5]	Second Year B.Tech. [Plastic & Polymer Engineering],
[6]	Second Year B.Tech [Electronics & Telecommunication Engg.],
[7]	Second Year B.Tech. [Computer Science Engineering].
	140 C

This is effective from the Academic Year 2017-2018 and onwards.

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus, *
Aurangabad-431 004. *
REF.No. SU/S.Y.B.TECH.2017/2173-84*

Date: - 28-06-2017.

Deputy Registrar Syllabus Section.

Copy forwarded with compliments to :-

- 1] The Principals, affiliated concerned Colleges, Dr. Babasaheb Ambedkar Marathwada University.
- 2] The Director, University Network & Information Centre, UNIC, with a request to upload this Circular on University Website.
- 1] The Director, Board of Examinations & Evaluation,
- 2] The Section Officer, [Engineering Unit] Examination Branch,
- 3] The Section officer, [Eligibility Unit],
- 4] The Programmer [Computer Unit-1] Examinations,
- 5] The Programmer [Computer Unit-2] Examinations,
- 6] The In-charge, [E-Suvidha Kendra],
- 7] The Public Relation Officer,
- 8] The Record Keeper,

SCHEME AND DETAILED SYLLABUS

of

S. Y. B. Tech. (Computer Science and Engineering)
Under Choice Based Credit & Grading System
(w.e.f. academic year 2017-18 & onwards/-)

(w.e.f. academic year 2017-18)

FOUR YEAR DEGREE COURSE IN SCIENCE & TECHNOLOGY



DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

S.Y. B. Tech. (Computer Science and Engineering)

	SEMESTER-III	Co	ntact	Hrs	/ Week	Examination Scheme					Examination Scheme						
Course Code	Course	L	Т	P	Total	СТ	тн	TW	P	Total	Credits	Duratio n of Theory Exam					
BSH 201	Engineering Mathematics III	3	1	-	4	20	80	-	-	100	4	3 Hrs					
CSE202	Discrete Mathematics	3	1	-	4	20	80	-	-	100	4	3 Hrs					
CSE203	Digital Electronics and Microprocessor		-	-	4	20	80	-	-	100	4	3 Hrs					
CSE204	Computer Graphics	4	-	-	4	20	80	-	-	100	4	3 Hrs					
CSE205	Data Structures	4	-	-	4	20	80	-	-	100	4	3 Hrs					
CSE206	Advanced C	2	-	-	2	10	40	-	-	50	2	2 Hrs					
CSE 221	Lab I: Digital Electronics and Microprocessor	-	-	2	2	-	-	25	25	50	1						
CSE 222	Lab II: Computer Graphics	-	-	2	2	-	-	50	-	50	1						
CSE223	Lab III: Data Structures	-	-	2	2	-	-	25	25	50	1						
CSE224	Lab IV: Computer Laboratory I (Advanced C)	1	-	2	2	-	-	25	25	50	1						
BSH 225	Lab V: Development of Skills II	-	-	2	2	-	-	50	-	50	1						
	Total of Semester-III	20	2	10	32	110	440	175	75	800	27						

	SEMESTER-IV Conta			Hrs	/ Week	Examination Scheme						
Course Code	Course	L	Т	P	Total	СТ	ТН	TW	P	Total	Credits	Duration of Theory Exam
BSH251B	Engineering Mathematics IV	3	1	-	4	20	80	-	-	100	4	3 Hrs
CSE 252	Object Oriented Programming Paradigm	4	-	-	4	20	80	-	-	100	4	3 Hrs
CSE 253	Database Management System	4	-	-	4	20	80	-	-	100	4	3 Hrs
CSE254	Computer Organization	3	1	-	4	20	80	-	-	100	4	3 Hrs
CSE291- 293	Programme Elective-I		-	-	4	20	80	-	-	100	4	3 Hrs
CSE255	Web Programming	2	-	-	2	10	40	-	-	50	2	2 Hrs
CSE271	Lab VI: Object Oriented Programming Paradigm	-	-	2	2	-	-	25	25	50	1	
CSE272	Lab VII: Database Management System	-	-	2	2	-	-	25	25	50	1	
CSE273	Lab VIII: Computer Laboratory II (Python Programming)	-	-	2	2	-	-	25	25	50	1	
CSE274	Lab IX: Web Programming	-	-	2	2	-	-	50	-	50	1	
CSE275	Lab X: DOS III: Technical Report Writing	-	-	2	2	-	-	50	-	50	1	
	Total of Semester-IV	20	2	10	32	110	440	175	75	800	27	
	Grand Total of III&IV									1600	54	

L: Lecture hours per week T: Tutorial hours per week P: Practical hours per week CT: Class Test TH: University Theory Examination TW: Term Work P: Practical/Oral Examination

Elective I – CSE291-Multimedia Techniques

CSE292- Human Computer Interaction

CSE293- Principles of Programming Languages

Dr. BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of S. Y. B. Tech. (All) Semester-III

Course Code: BSH201	Course: Engineering Mathematics –III

Teaching Scheme: 04Hrs/week Class Test: 20 marks

Theory: 03Hrs/week
Tutorial: 01Hr/week
Theory Examination (Duration): 03 Hrs
Theory Examination (Marks): 80

Tutor	ial	01Hr/week Theory Examination (Marks): 80
Credi	ts:	04
Objectives	:	1. The contents aims to develop and apply the knowledge of the student in the
		direction of solving the practical problem of differential equation in the
		engineering and technology.
		2. To develop Logical understanding of statistics.
		3. To study the basic of Laplace transform.
Unit-I	:	Linear Differential Equation:
		Solution of linear differential equation of order n with constant coefficients: The
		complementary function, Method of finding particular integral: Short method,
		General method, Method of variation of parameters.
		Equations reducible to linear equations with constant coefficients: i) The
		Cauchy's linear equation. ii) The Legendre's linear equation. (10 Hrs)
Unit-II		Application of linear differential equations to:
		i) Mechanical system.
		ii) Electrical System
		iii) Beam and Shafts
		(04 Hrs)
Unit-III	:	Vector Differentiation:
		Differentiation of vectors, Radial, Transverse, Normal and tangential
		components of velocity and acceleration, Scalar and vector point function,
		Gradient of scalar point function, Divergence and curl of vector point function,
		Second order differentiation operator, Irrotational and solenoid fields.
		(10 Hrs)
Unit-IV	:	Laplace Transform:
		Definition, Laplace Transform of elementary function and its table, Theorem and
		properties of Laplace Transform: First shifting theorem, Second Shifting
		Theorem, Multiplication by t, Division by t, Change of scale property, Laplace
		Transform of integral, Laplace Transform of Derivative.
		Laplace Transform of some special functions: Periodic function, Heaviside Unit
		Step Function, Displaced Heaviside Unit Step Function Laplace Transform
		using Heaviside Unit function, Dirac delta function.
		Method to find inverse Laplace Transform:
		i. Use of Laplace Transform tableii. Use of Theorem and properties of Laplace
		iii. Use of partial fraction
		iv. Convolution theorem
		v. Use of development of Heaviside Unit Step Function
		Application of Laplace Transform to solve linear differential equation
		(12 Hrs)
		(12 1113)

Unit-V	:	Fourier Transform:				
		Fourier integral: Complex form of Fourier integral, sine and cosine integral,				
		Fourier transform and inverse transform. D.U.I.S. rule (only statement), Fourier				
		transform and inverse transform for even and odd function, Fourier sine and				
		cosine transform and inverse transform.				
		(7 Hrs)				
Unit-VI	:	Statistics:				
		Measures of central tendency: Mean, Median, Quartiles and Mode. Measures of				
		dispersion: Quartile deviation, Mean deviation, Standard deviation, coefficient				
		of variation. (5 Hrs.)				
Reference	:	1) A Text Book of Applied Mathematics Volume-III by P.N. Wartikar				
Books:		J.N.Wartikar, Pune VidyarthiGrihaPrakashan.				
		2) Advanced Engineering Mathematics by H. K. Dass, S. Chand and Co.				
		Ltd.				
		3) Higher Engineering Mathematics by Dr. B. S. Grewal, Khanna				
		Publishers.				
		4) Higher Engineering Mathematics by B. V. Ramana, Tata McGraw-Hill				
		Publishing Co. Ltd.				
		5) Solution to Higher Engineering Mathematics Volume –III by C. P.				
		Gandhi				

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

- 1. Minimum ten questions
- 2. Five questions in each section
- 3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. BabasahebAmbedkar Marathwada University, Aurangabad
(Faculty of Science and Technology)
Syllabus of S.Y.B. Tech. (Computer Science and Engineering) Semester-III

Code No.: CSE202 Course: Discrete Mathematics

Teaching Scheme:04 Hours per week Class Test: 20

Theory: 03 Hours per week
Tutorial: 01 Hr per week
Theory Examination (Duration): 03 Hrs
Theory Examination (Marks): 80

Credits:04

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	1. To learn formal logic, proofs, sets, relations and functions.
Objectives	2. To relate the ideas of mathematical induction to recursion and recursively defined
	structures.
	3. To learn graphs and trees related algorithms.
	4. To apply these concepts to various areas of computer science.
Unit-I	: Set Theory and Logic:
	Discrete Mathematics, Significance of Discrete Mathematics in Computer
	Engineering.
	Sets
	Sets, Set Operations, Finite and Infinite Sets, Uncountable Infinite Sets,
	Mathematical Induction, Principle of Inclusion and Exclusion.
	Propositional Logic
	Logic, Logical Connectives, Propositional Equivalences, Predicates and Quantifiers,
	Application of Propositional Logic-Translating English Sentences, Proof Methods
	and Strategy. (08Hrs)
Unit-II	Relations and Functions
	Relations – Definition, Properties of binary relations, N-ary Relations and their
	Applications, Representing Relations, Closures of Relations, Equivalence
	Relations, Partial Orderings, partitions, Hasse Diagram, Lattices, Chains and Anti-
	Chains.
	Functions- Surjective, Injective and Bijective functions, Inverse Functions and
	Compositions of Functions, The Pigeonhole Principle. (08Hrs)
Unit-III	: Recurrence Relations
	Recurrence Relation, Linear Recurrence Relations with constant Coefficients,
	Homogeneous Solutions, Total solutions, Solutions by the method of generating
	functions. (08Hrs)
Unit-IV	: Permutations and Combinations
	The ruleof sum and product, Permutations, Combinations, Binomial Coefficients,
	Generalized Permutations and Combinations, Algorithms for generating
	Permutations and Combinations.(08Hrs)
Unit-V	: Graphs
	Basic terminology, multi graphs and weighted graphs, Representation of graph,
	Operations on Graphs, Hamiltonian and Eulerian paths and circuits, Shortest path-
	Dijkstra's algorithm, Traveling salesman problem, Factors of a graph, Planer graphs,
	Graph Coloring.
	Trees: Introduction, Basic Terminology.(08 Hrs)
Unit-VI	: Algebraic Structures
	The Structure of Algebras, Semigroups, Monoids and Groups, Homomorphism and
	Normal Subgroups, Rings, Integral Domains and Fields, Polynomial Rings and
	PolynomialCodes.(08 Hrs)

Reference	:	1. "Elements of Discrete Mathematics", BY C.L. LIU, Tata McGrawHill		
Books:		publication.		
		2. "Discrete Mathematics and its Application", BY Kenneth H. Rosen, Tata		
		McGraw-Hill, 7 th Edition.		
		3. "Discrete Mathematics", BY R. Johnsonbaugh, Pearson Education		
		publication.		
		4. "Discrete Mathematics with Graph Theory", BY E. Goodaire, M. Parmenter,		
		Pearson Education.		
		5. Elements of Discrete Mathematics", BY C.L LIU, D.P. Mohapatra, Tata		
		McGraw-Hill publication.		

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

- 1. Minimum ten questions
- 2. Five questions in each section
- 3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Note:12 Tutorials should be based on above syllabus

Dr.BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of S.Y.B. Tech. (Computer Science and Engineering) Semester-III

Code No.: CSE 203 Course: Digital Electronics

andMicroprocessor

Teaching Scheme:04 Hours per week Class Test: 20

Theory: 04 Hours per week Theory Examination (Duration): 03 Hrs

Credits:04 Theory Examination (Marks): 80

Course	1. To understand the basics of digital electronics, Logic gates andboolean Algebra
Objectives	2. To understand the design and functionality of the Combinational and Sequential
	Logic circuits
	3. To learn the basics, architecture and assembly language of microprocessor 8086
	4. To understand the architecture and working of 8051 microcontroller
Unit-I	: Number systems and Codes:- Introduction to Digital Circuit and Digital Signal,
	Number systems(Binary, Octal, Decimal, hexadecimal), Number System
	conversions, , Binary arithmetic, 1's and 2's complement method, Concept and
	Type of Codes(Weighted and Non-Weighted Codes), Binary to gray and gray to
TI24 TT	binary code conversion. (08Hrs)
Unit-II	: Logic Gates and Boolean algebra –Basic Logic Gates, Universal gates and their
	truth tables, Realization of Basic logic gates using universal gates, Boolean Algebra,
	De-Morgan's Theorem, Implementation of Boolean equation with Logic Gates.
	(08Hrs)
Unit-III	: Combinational and Sequential Logic Circuit - SOP and POS form, Min-term and
	Max-term, Representation of logical function, Minimization using K- Map (Upto 4
	variables), QuinMcClusky method for minimization. Binary half and Full adders,
	Binary half and full subtractors, Multiplexers and Decoders. Introduction to
	Sequential Circuits – Basic Latch, Introduction to Flipflop and its type.
	(08Hrs)
Unit-IV	: Microprocessor and Assembly Language Programming: Introduction to
	Microprocessor, Evolution of microprocessor family, Architecture of 8085, Features
	of 8085, Architecture of 8086, Signal descriptions of 8086, Addressing Modes of
	8086, Instruction set of 8086/8088, Assembler Directives and operators, Assembly
	Language Programs, Interrupts - Maskable and Non Maskable Interrupts.
	(08Hrs)
Unit-V	: Peripherals and their Interfacing with 8086/8088 : Introduction to Interfacing,
	Memory Interfacing, Programmable Input-Output Port 8255, Modes of operation of
	8255, Programmable Interval Timer 8253, Programmable Communication Interface
	8251 USART, DMA Controller 8257.
	(08 Hrs)
Unit-VI	: Microcontroller: Introduction to Microcontroller, Comparison of Microprocessor
	and Microcontroller, Microcontroller 8051 - Block Diagram, Family of 8-bit
	Microcontrollers, Architecture of 8051, Features of 8051.
	(08 Hrs)
Reference	: 1. R.P. Jain, Modern Digital Electronics, Tata McGraw Hill
Books:	2. A. Anand Kumar, Fundamentals of Digital Circuits" Second Edition, PHI
200130	3. A.K. Ray and K. M. Bhurchandi, "Advanced Microprocessors and Peripherals",
	Second Edition, Tata
	McGraw Hill
	4. MuhammasMazidi, Janice Mazidi and RolinMcKinlay, —The 8051
	Microcontroller and Embedded
	Systems using Assembly and C, Pearson Education. 5. Prov. Porty P. The Intel Micrograph accepts 2026/2028, 20286, 20286, and 20486.
	5. Brey, Barry B, - The Intel Microprocessors 8086/8088, 80286, 80386 and 80486
	Assembly Language

Programming, Prentice Hall. 6. Scott Mackenzie, —The 8051 Microcontroller, Prentice Hall India,
7. Douglas Hall, Microprocessor and Interfacing, McGraw Hill

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

Pattern of Question Paper:

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	Dr. BabasahebAmbedkar Marathwada (Faculty of Science and To	• ,						
Code Teach Theor Tutor	syllabus of S.Y.B. Tech. (Computer Science at No.: CSE204 Courting Scheme:04 Hours per week ry: 04 Hours per week Tail: NA							
Credi	its: 04							
Course Objective:	 Describe basic and advanced concepts, application areas of Computer Graphics. Analyze and select proper graphics techniques suitable for application areas. Explain and justify use of imaging systems, projection and shading techniques. 							
Unit-I	Display Devices, Raster-Scan Systems, Coordinate Representations, Graphics Conversion: Points, lines, circles and	plications of Computer Graphics, Video Input Devices, Hard-Copy Devices, Functions, Software Standards Scan ellipses as primitives, scan conversion ial Analyzer (DDA) and Bresenham's line						
Unit-II	: Windowing, Clipping and Polygons: Window to viewport transformations, 2L algorithm, Introduction to polygon, inside	O clipping, Cohen-Sutherland line clipping de-outside test, Polygon filling: flood fill, Polygon clipping: Sutherland-Hodgman						
Unit-III	: The OpenGL: The OpenGL API, primitives and attrib	butes, color, viewing, control functions, y lists and modelling, Programming event						
Unit-IV	rotation about an arbitrary point, transformations, reflection and shearing. 3D Transformations: Introduction, 3D geometry, 3D Translatio rotation about an arbitrary axis, Transformations, 3D clipping. Concept of	n, rotation, scaling), matrix representation, homogeneous coordinates, composite n, Rotation, Scaling, matrix representation,						
Unit-V	: Visible Surface Detection and Shading Visible surface detection concepts, back- buffer, Painters, Warnock, BSP tree, scar	face detection and removal, Algorithms: Z in line. and Specular reflection, Shading algorithms						
Unit-VI	: Curves, Fractals and Animation: Curve generation, Interpolation, B-Spline fractal lines and surfaces, fractal generation Animation:	e and Bezier curves and surfaces, Fractals, on. ences, Conventional and computer based						
Text Books:		h Edition) by Donald D. Hearn, M. Pauline						

		2. Edward Angel, Interactive Computer Graphics. A Top-Down Approach Using	
		OpenGL (fifth Edition),Pearson Education, 2008.	
		3. S. Harrington, "Computer Graphics", 2 nd Edition, McGraw-Hill Publications	
Reference	:		
Books:		1. Edward Angel, OpenGL: A primer 2 nd edition, Addison-Wesley, 2005.	
		2. The OpenGL Programmer's Guide (the Redbook), Addison-Wesley.	
		3. The OpenGL Reference Manual (the Bluebook), Addison-Wesley.	

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

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Dr.BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of S.Y.B. Tech. (Computer Science and Engineering) Semester-III

Code No.: CSE 205 Course: Data Structures

Teaching Scheme:04 Hours per week Class Test: 20

Theory: 04 Hours per week Theory Examination (Duration): 03Hrs

Credits:04 Theory Examination (Marks): 80

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Course	1. To understand importance of data structures in implementing efficient		
Objectives	programs.		
	2. To implement basic data structures- stack, queue, linked list.		
	3. To understand various searching and sorting technique.		
	4. To study graphs, tree related algorithm and identify appropriate data		
	structure to solve real world problems.		
Prerequisite	1. C Programming Language for implementation		
Course	After completing this course the student will be able to:		
Outcomes	1) Define the concept of data structures and discriminate usage of various data		
	structures in approaching a problem.		
	2) Develop static and dynamic implement ion of stacks and queues and		
	identify their applications.		
	3) Apply the concept of linked list for implementing various data structures.		
	4) Perform insertion, deletion, search and traversal operations on a binary		
	search tree.		
	5) Compare various graph traversal techniques, construct minimum cost		
	spanning tree for a given graph and find shortest path in a graph.		
	6) Analyze appropriate sorting techniques to be applied in a given situation.		
	Identify and study real world application of data structures.		
Unit-I	: Introduction to Data Structures: Concept of Data and Information. Data Type-		
	primitive and non primitive. Data Structures- Definition ,importance,		
	classification, implementation aspects and memory representation, examples,		
	applications, Abstract Data types- basics, importance, ADT representation of		
	various data structures. Introduction to linear data structure- Arrays and its		
	operations. (08Hrs)		
Unit-II	: Stacks and Queues: Stack- definition, terminology, memory representation,		
	operations on stack- create, push, pop, peek, empty, full, , implementation using		
	arrays. Applications of stack- recursion, polished and reverse-polished notations-		
	conversion and evaluation,		
	Queues- definition, terminology, memory representation, operations on queue-		
	create, enqueue, dequeue, empty, full, front, implementation using array. Types of		
	queues- linear, circular, doubly ended., priority queue. Applications of queue.		
	(08Hrs)		
Unit-III	: Linked Representation: Concept of Dynamic Memory Allocation. Linked List-		
	definition, memory representation, importance, types- singly linked list, doubly		
	linked list, circular linked list. Operations on linked lists. Applications of linked		
T1 .*4 TX7	list- polynomial manipulation. Comparing various types of linked lists. (08Hrs)		
Unit-IV	: Trees: Tree- Basic terminology. Binary tree- definition, types- complete, almost		
	complete, strictly binary tree. Binary search tree- definition, array and linked		
	representation, operations- insertion, deletion, traversal- in-order, pre-order, post-		
	order, level-order, search. Application of binary search tree. Height Balance Tree (AVL)- Importance, rotations- left, right, left-right, right-		
	left, constructing AVL tree, applications.		
	Introduction to B tree, B+ tree, red-black tree, threaded binary tree. (08Hrs)		
Unit-V			
Omt- v	memory. Graphs - Basic terminology, types of graphs, representing graphs in memory. Graph Traversals- Breadth First Search, Depth First Search, comparison		
L	memory. Oraph Traversais- breadin rust Search, Depth rust Search, Companson		

		of BFS and DFS. Finding shortest path in graphs- Dijkstra's algorithm, Bellman		
		Ford algorithm.		
		Minimum Spanning Tree- definition, constructing minimum spanning tree-		
		Kruskal's algorithm, Prim's Algorithm, Application of graphs in real world.		
		(08Hrs)		
Unit-VI	:	Sorting, Searching and miscellaneous: Sorting: define, categories- comparison		
		based, counting based, in-place, not-in-place, stable. Bubble sort, insertion sort,		
		quick sort, heap sort. radix sort, shell sort. Comparison of sorting techniques.		
		Searching: Linear search, binary search. Hashing- concept, examples, collision,		
		resolving collision, applications of hashing. Indexing.		
		Application of data structures in real world- Database and Expert Systems.		
		(08Hrs)		
Reference	:	1. "Data Structures using C and C++", by		
Books:		AugensteinandTenenbaumLangsam. Prentice Hall of India; Second		
		Edition (2007)		
		2. "Data Structures and Program Design in C" by Robert L. Kruse, Bruce P.		
		Leung. Printice Hall; Second Edition(1996)		
		3. "Algorithms+Data Structures = Programs" by Wirth Niklaus. Printice		
		Hall Series in automatic computation.		
		4. "Data Structures through C" by Yashvant P. Kanetkar. BPB publication;		
		Second Edition(2003).		
		5. "Data Structures" by Seymour Lipschutz. McGraw Hill Education;		
		Revised First Edition(2014)		
Online	:	1. NPTEL Course by Prof. Naveen Garg, IIT Delhi		
Material		http://nptel.ac.in/courses/106102064/		
		2. Programming and Data Structures material by Prof. PallabhDasGupta, IIT		
		Kharagpurhttp://cse.iitkgp.ac.in/~pallab/pds16/pds16.htm		
		3. Programming and Data Structures material by Prof. PrathaPratim Das, IIT		
		Kharagpurhttp://cse.iitkgp.ac.in/~ppd/		

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

Pattern of Question Paper:

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Dr.BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of S.Y.B. Tech. (Computer Science and Engineering) Semester-III

Code No.: CSE206 Course: Advanced C

Teaching Scheme:02 Hours per week Class Test: 10

Theory: 02 Hours per week
Credits:02

Theory Examination (Duration): 02 Hrs
Theory Examination (Marks): 40

Course	:	Implement structures and Union in C
Objectives		2. Perform memory operations using pointers.
		3. Distinguish various number systems, representations and apply bitwise
		operations
		4. Identify storage classes in C and evaluate appropriate situation to use local,
		global and static variables.
Unit-I	:	Structures and Union: Structures – Definition, Declaration and types, accessing
		elements of structure, range of signed and unsigned data types. Unions -,
		Declaration and types, accessing elements of unions(04 Hrs)
Unit-II	:	Pointers: Accessing a Variable Through Pointer, Memory Allocation, Declaration
		and Initialization, Dereferencing, Pointer Increment and Scaling, Pointers and
		Arrays, Character Arrays using Pointers, Array of Character Pointers Memory
		Diagram – Array of Char Pointers Arrays as Pointers(04 Hrs)
Unit-III	:	Computing Basic: Binary and Octal Systems, Decimal and Hexadecimal Systems,
		Signed Representations in Memory: Binary Shifts – Right and Left, Sign Bits and
		Bit-Shift Operations, Right Shift – Logical Vs Arithmetic Shift, ASCII
		Representations, Endian-ness – Little Vs Big, Operators - Bitwise Operations,
		Logical Operators, sizeof() operator, Operator Precedence, Operator
		Associativity(04 Hrs)
Unit-IV	:	Storage Classes: Storage Class Specifiers Scope of a Variable Register, Auto,
		Static, Extern, Variables and Stack Static Variables and Functions,
		Local/Block/Global Scope, Nesting of Scope, Lifetime of a Variable, Linkage of a
		Variable.(04 Hrs)
Unit-V	:	File Input/Output: Data Organization, File Operations - Opening a File, Reading
		from a File, Trouble in Opening a File, Closing the File. Counting Characters,
		Tabs, Spaces. File Opening Modes String (line) I/O in Files, Record I/O in Files
		Text Files and Binary Files, Record I/O Revisited Database Management(04 Hrs)
Unit-VI	:	Interaction with Hardware
		Hardware Interaction, DOS Perspective Hardware Interaction, Windows
		Perspective Communication with Storage Devices, Accessing Other Storage
		Devices Communication with Keyboard - Dynamic Linking, Windows Hooks,
D 6		Caps Locked, Mangling Keys, KeyLogger.(04 Hrs)
Reference	:	1. "Let us C" by YashwantKanetkar. BPB Publications; Thirteenth Revised
Books:		and updated
		2. Edition(2016)
		3. "Understanding Pointers in C", by YashwantKanetkar BPB Publications
		4. "C: The Complete Reference" by Herbert Schildt. McGraw Hill Education;
		Fourth Edition (2000) "The C Programming Language" by Prion W. Kernichen, Dennis Pitchia, Programming Language and Prion W. Kernichen, Dennis Pitchia, Programming Language and Prion W. Kernichen, Dennis Pitchia, Programming Language and Prion W. Kernichen, Prion W.
		"The C Programming Language" by Brian W. Kernighan, Dennis Ritchie. Pearson
		Education India; Second Edition (2015)

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

- 1. Minimum eight questions.
- 2. Four questions in each section.
- 3. Question no 1 from section A and Question no 5 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for six marks each. The Question no.1 and 5 should be of objective nature.
- 4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

Dr. BabasahebAmbedkar Marathwada University, Aurangabad (Faculty of Science and Technology) Syllabus of S.Y. B. Tech. (Computer Science and Engineering) Semester- III Code No.: CSE221 **Course: Lab Digital Electronics and** Microprocessor Termwork: 25 marks Practical: 02 Hours per week Practical:25 marks Credits:01 **Total Examination (Marks): 50 Marks** : 1. Demonstrate the basic logic gates and combinational logic circuits Course 2. Select the addressing modes and instruction set to implement different assembly **Objective** language programs 3. Develop the skills to write and execute the program for microcontroller 8051 Implementation of Boolean expression using AND/OR/NOT and List of **Practicals** NAND/NOR logic. (Minimu 2. Realization of Half and Full Adder using logic gates m ten 3. Realization of Half and Full Substractor using logic gates To Study TASM/MASM/emu8086 experime 4. Write an Assembly language program to print the string in 8086 nts to be 5. Write an Assembly language program for 8-bit addition and 16-bit addition performe 6. in 8086 d) 7. Write an Assembly Language Program for 8-bit substractionand 16-Bit substraction in 8086 Write an Assembly Language Program for 8-bit multiplication and 16-bit division in 8086 Write an Assembly Language Program for finding smallest number from an 9. 10. Write a program to create LED pattern generation/blink LED in 8051microcontroller List of : 1. R.P. Jain, Modern Digital Electronics, Tata McGraw Hill Reference 2. A. Anand Kumar, Fundamentals of Digital Circuits" Second Edition, PHI 3. A.K. Ray and K. M. Bhurchandi, "Advanced Microprocessors and Peripherals", **Books** Second Edition, Tata McGraw Hill 4. MuhammasMazidi, Janice Mazidi and RolinMcKinlay, —The 8051 Microcontroller and Embedded Systems using Assembly and C, Pearson Education. 5. Douglas Hall, Microprocessor and Interfacing, McGraw Hill

The assessment of term work shall be done on the basis of the following.

- 1) Continuous assessment.
- 2) Performing the experiments in the laboratory.
- 3) Oral examination conducted on the syllabus and term work mentioned above.

(Faculty of Science and Technology) Syllabus of S.Y. B. Tech. (Computer Science and Engineering) Semester- III Code No.: CSE222 **Course: Computer Graphics Lab** Termwork:50 marks Practical: 02 Hours per week Practical:NA Credits:01 **Total Examination (Marks): 50 Marks** 1. Explore various functions in 'C graphics library' to implement graphics Course **Objective** primitives. 2. Apply graphics programming techniques to design and create Computer Graphics scenes. 3. Implement various algorithms for generating and rendering graphical figures. 1.Design and develop simple graphics programs using basic graphics functions List of : Practical' defined in "graphics.h". 2. ImplementDDA andBresenham's line drawing algorithm in C/C++. 3. Implement Cohen Sutherland line clipping algorithm in C/C++. (Minimu 4. Implement polygon filling algorithms in C/C++. ten 5. Design and develop OpenGL programs to implement basic graphics experime primitives. nts to be performe 6. Write C/C++ program to draw 2D object and perform translation, rotation and scaling transformations. **d**) 7. Write C/C++ program to implement any one hidden surface removal algorithm. 8. Write C/C++ program to draw any object using any curve generation technique. 9. Write C/C++ program to generate snowflake using concept of fractals. 10. Write C/C++ program to simulate any one of or similar object: • Chess / Ludo Board Mickey Mouse • Moving 3D box in free space Analog clock • Tower of Hanoi – A graphical representation 11. Case study of any graphics tool (Direct3D/Maya/Blender). List of 1. Computer Graphics with Open GL: (4th Edition) by Donald D. Hearn, M. Pauline Baker, Warren Carithers, Pearson Education. Reference

Dr. BabasahebAmbedkar Marathwada University, Aurangabad

The assessment of term work shall be done on the basis of the following.

1. Continuous assessment.

Books

- 2. Performing the experiments in the laboratory.
- 3. Oral examination conducted on the syllabus and term work mentioned above.

2. Edward Angel, OpenGL: A primer 2nd edition, Addison-Wesley, 2005.

Dr. BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of S.Y. B. Tech. (Computer Science and Engineering) Semester- III

Code No.: CSE 223 Course: Data Structures (Lab)

Termwork :25 marks

Practical: 02 Hours per week Practical: 25 marks
Credits: 01 Total Examination (Marks): 50

Course Objective

- 1. Define the concept of data structures and discriminate usage of various data structures in approaching a problem.
- 2. Develop static and dynamic implement ion of stacks and queues and identify their applications.
- 3. Apply the concept of linked list for implementing various data structures.
- 4. Perform insertion, deletion, search and traversal operations on a binary search tree.
- 5. Compare various graph traversal techniques, construct minimum cost spanning tree for a given graph and find shortest path in a graph.
- 6. Analyze appropriate sorting techniques to be applied in a given situation. Identify and study real world application of data structures.

List of Practicals (Minimu m ten experime nts to be performe d)

1. "MIT Banking Application"- Students are required to create a menu driven program which provides choice of following operations: Create Account, Modify Account Details, Deposit Amount, Withdraw Amount, Account Summary, and exit. A user can perform any of these operations any number of times till he chooses to exit.

Hint:

- 1. Declare the structure for AccountHolder acc no, name, balance.
- 2. Create functions for CreateAccount, ShowAccount, UpdateAccount, Withdraw, and Deposit.
- 3. Create an array of AccountHolder in main()
 - 2. Static and Dynamic implementation of Stack- Students are required to create a menu driven program which provides choices to perform Stack operationscreate, push, pop, peek, isempty, isfull and exit. User can perform any of these operations any number of times till he choses to exit.

You are required to create stack using array and using linked list (separate program for each, main will be same for both).

3. Static and Dynamic implementation of Queue- Students are required to create a menu driven program which provides choices to perform Queue operations- create, enqueue, dequeue, isempty, isfull, front and exit. User can perform any of these operations any number of times till he choses to exit.

You are required to create queue using array and using linked list (separate program for each, main will be same for both).

4. Linked List- Students are required to create a menu driven program which provides choices to perform operations on – singly or doubly linked list. Singly linked and doubly linked list operations include- Create, InsertFront, InsertEnd,InsertBefore, InsertAfter, DeleteFirst, DeleteLast, Deleteparticular,Traverse, Search. User can perform any of these operations any number of times till he choses to exit.

Hint:

- 1. Create two structures- SinglyLinkedList, DoublyLinkedList.
- 2. Create two start pointers- SinglyStart, DoublyStart
- 3. Create separate functions for singly linked list operations and doubly linked list

operations

- 4. create a two level menu- at first level choices will be 1. Singly Linked list 2. Doubly Linked List. At second level choices will be of operations on the chosen type of linked list.
 - 5. Binary Search Tree Students are required to create a menu driven program which provides choices to perform operations on a Binary Search Tree-CreateTree, InsertNode, DeleteNode, SearchNode, Traverse- in-rder, preorder, post-order and exit. User can perform any of these operations any number of times till he choses to exit.
 - **6.** Graph Traversals- Given the adjacency matrix representation of a graph, students are required to create a menu driven program which provides choices to perform the traversal of the given graph in Breadth First Search, Depth First Search. The output will be displayed for chosen traversal method. User can perform any of these operations any number of times till he choses to exit, every time you can enter different graph.

Hint:

- 1. Declare an adjacency matrix to represent graph.
- 2. Create separate functions for BreadthFirstSearch andDepthFirstSearch.
- 3. Create menu in main()
 - 7. Shortest Path Algorithm- You own a goods transport firm, the company is facing losses as they mostly end up choosing an inefficient path between pair of cities. Students are required to provide an optimum shortest path between two cities so that the distance is minimum. You will be given cost of traveling from one city to another (if they connect directly) otherwise zero. Assume set of n cities.

Hint:

- 1. Declare an adjacency matrix to represent the weighted graph of path between n cities
- 2. Create a function with computes shortest path between source and destination using Dijekstra's Algorithm.
 - 8. Sorting- MIT Library has n books; each book has a serial number. Students are required to write program to sort the serial numbers in ascending order using Bubble Sort. (array of serial number is input)
 - 9. Sorting- A recruitment drive is to be conducted at MIT; the recruiter wants the list of students to be sorted in ascending order of their average percentage. Students are required to sort the list by using Quick Sort. (array of average percentage is input)
 - 10. Searching- CSE Students have a unique enrollment number, given a list of these enrollment numbers you are required to search for a particular number (to be input by user) and display its position in array and display failure if the number is not present in the list. Use (a) Linear Search (b) Binary Search . Select search technique as per user's choice. Assume the list to be random (perform sorting first in case of binary search)
 - 11. Programs for sorting- Insertion sort, Heap sort, Radix sort.

		12. Programs for creating Minimum Spanning Tree- Kruskal's Algorithm.			
List of	:	1. "Data Structures using C and C++", by AugensteinandTenenbaumLangsam.			
Reference		Prentice Hall of India; Second Edition (2007)			
Books		2. "Data Structures through C" by Yashvant P. Kanetkar. BPB publication; Second			
		Edition (2003).			
		3. "Data Structures" by Seymour Lipschutz. McGraw Hill Education; Revised First			
		Edition(2014)			
		4. "Data Structures using C" by E. Balagurusamy. McGraw Hill Eduction; First			
		Edition(2013)			
Online	:	1. NPTEL Course by Prof. Naveen Garg, IIT Delhi			
Material		http://nptel.ac.in/courses/106102064/			
		2. Programming and Data Structures material by Prof. PallabhDasGupta, IIT			
		Kharagpurhttp://cse.iitkgp.ac.in/~pallab/pds16/pds16.htm			
		3. Programming and Data Structures material by Prof. PrathaPratim Das, IIT			
		Kharagpurhttp://cse.iitkgp.ac.in/~ppd/			

The assessment of term work shall be done on the basis of the following.

- 1) Continuous assessment.
- 2) Performing the experiments in the laboratory.
- 3) Oral examination conducted on the syllabus and term work mentioned above.

Dr. BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of S.Y. B. Tech. (Computer Science and Engineering) Semester- III

Code No.: CSE224 Course: Computer Laboratory- I(Advanced C

Term-work :25 marks
Practical:25 marks

Practical: 02 Hours per week Practical:25 ma

Credits:01 Total Examination (Marks): 50 Marks

Course Objective s	:	 After completing this course the student will be able to: 1) Apply basic elements of C programming including primitive, non-primitive data types in programs. 2) Perform memory manipulation using pointers.
		 3) Distinguish various number systems, representations and apply bitwise operations 4) Identify storage classes in C and evaluate appropriate situation to use local, global and static variables.
List of Practical's (Minimu m ten experime nts to be performe d)	•	 Program to implement basic operations on a "Student Information Portal" using Structure, Arrays, Functions. Program to implement basic operations on Union. Program to demonstrate- (a) Pointer operations (b) Passing Pointer to function (c) function 4. 4. 4. Returning Pointers (d) Character array using Pointers. Program for Dynamic memory allocation- Operations on Singly Linked List. Program to demonstrate- (a) Bit wise Operators (b) logical Operators. Program for Decimal to Binary Conversion. Program to Demonstrate (a) Storage Classes in C (b) Macros. Perform Read and write operations on text file and print its contents on Console. Program to copy a binary file to another. Program do demonstrate hardware interaction with (a) Storage Device (b) Keyboard
List of Reference Books	•	 "Let us C" by YashwantKanetkar. BPB Publications; Thirteenth Revised and updated Edition (2016) "Understanding Pointers in C", by YashwantKanetkar BPB Publications "C: The Complete Reference" by Herbert Schildt. McGraw Hill Education; Fourth Edition(2000) "The C Programming Language" by Brian W. Kernighan, Dennis Ritchie. Pearson Education India; Second Edition(2015)

The assessment of term work shall be done on the basis of the following.

- 1) Continuous assessment.
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Dr. BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Science & Technology)

Syllabus of S. Y. B. Tech all Semester-III

Code No.: BSH225 Course: Lab V: Development of Skills-II

Teaching Scheme: 2 hrs/week Termwork: 50 marks

Teaching So	cheme	: 2 hrs/week		Termwork: 50 marks		
Practical: -	2 hrs/	'week				
Credits:1	I					
Course		.Students will be able to apply communicative English Grammar in communication.				
Objectives				the level of English voca		
			to pror	nounce and articulate w	ords as well as sentences	
		curately.				
				and and apply correct bod	y language eventually.	
		idents will be able to	_			
	6.Stu	idents will be able to	develop	placeability skills and bu	isiness correspondence.	
	α.	G	G	4		
T int of	Sr.	Section	Conten	ts		
List of Practical	No.	English	Ctmacture	of contanges type	s of santanaes alouses	
Fractical		English Communicative		• •	s of sentences, clauses,	
	1	Grammar	grannia	atical common errors in E	ngnsn(04 m/s)	
		Grammar				
		Vocabulary	Usage o	of words in sentences co	ommon errors in spelling of	
	2	Building		synonyms, antonyms, phr		
					pronunciation of words,	
					sion of words to phonetic	
	3	Phonetics	_	-	abols to words, British and	
			America	an English (basic differe	nce in vocabulary, spelling,	
			pronunc	ciation and structure), non	-verbal language.(04 hrs)	
		Non-verbal				
	4	Communication		•	icial expression, proxemics,	
		(Body language)		nics, appearance and sym		
	_	0 6 01 11	Personality development, self analysis through SWOT, Johari window, interpersonal skills, perception and attitude,			
	5	Soft Skills		and ethics, career planning		
	6	Placeability	Job application, resume writing, analytical and reasoning test, debate, group discussion, demo presentation and			
		Skills	interview skills.(04 hrs)			
	7	Business			hard copy and soft copy),	
	7	Correspondence			port writing. (02 hrs)	
List of	Sr.	Title		Author	Publication	
Reference	No.	Title			1 donedion	
Books		The Essence of Eff	fective	Adrian Budday, Ron	Prentice Hall of India-	
	1	Communication		Ludlow and Fergus'	Private Ltd.	
				Panton	The energy Resource	
	2	Communicating in	Style	Yateendra Joshi	Institute	
		Effective Technica	1		McGraw Hill International	
	3	Communication	.1	Anne Eisenberge	Editors	
				A. K. Jain, Pravin, S.		
	4	Professional	_:11.	R. Bhatia, A. M.	S. Chand & Company Ltd.	
		Communication SI	on Skills Sheikh			
	5	Business Commun	ication	Urmila Rai, S. M. Rai	Himalya Publishing	
)	Dusiness Communi	ncauon	Ullilla Kai, S. Wi. Kai	House	

	Developing	Krishna Mohan and	M
6	Communication Skills	Meera Banerjee	Macmillan India Limited
7	Better English Pronunciation	J.D.O'Connor.	Cambridge Publication
8	Professional Communication Skill	Pravil S.R. Bhatia, S.Bhatia	S. Chand & Co
9	Living English Structure	Allan Walter	Pearson Education India
10	Communication Techniques &Skill	R.K. Chadha	
11	Technical Communication- Principles and Practice	Meenakshi Raman &Sangeeta Sharma	Oxford University Press
12	A course in Phonetics & Spoken English	J.Sethi,P.V.Dharmatm a	PHI publication
13	Communication Skills for Engineers	Sunita Mishra, C. Murli Krishna	Pearson Education
14	Communication Skills	LeenaSen	PHI
15	Technical Communication A Reader Centered Approach	Paul V. Anderson	Thomson Publication
16	Grammar of Spoken and Written English	DauglasBiber, Geoffrey Leech	Longman
17	A Practical English Grammar	A.J. Thomson & A.V. Martinet	Oxford University Press
18	Oxford English Grammar	Sydney Greenbaum	Oxford University Press
19	Developing Graduate Employability Skills: Your Pathway to Employment	Mercy V. Chaita	Universal Publishers

The assessment of term work shall be done on the basis of the following.

- 1) Continuous assessment.
- 2) Performing the experiments in the laboratory3) Oral examination conducted on the syllabus and term work mentioned above.

Dr. BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Engineering & Technology)

Syllabus of S.Y.B. Tech. (Computer Science and Engineering) Semester-IV

Course Code: BSH251B		ode: BSH251B	Credits: 04	
Course	: E	ngineering Mathematics -IV	Class Test: 20 marks	
Teachi	ng S	Scheme: 04 Hrs/week	Theory Examination (Duration): 03 Hrs	
Theory	7 : 0 :	3 Hrs/week	Theory Examination (Marks): 80	
Tutoria	al: (01 Hr/week		
Objectives	•	 To develop the mathematical skills of the student related to function of complex variable and Vectors. To study and apply various types of transforms. To provide Numerical techniques for solving the practical problem in engineering and technology. 		
Unit-I	:	Function of complex variable :		
		polar coordinates ,Harmonic func plane: Line integral, Contour	ction, orthogonal system, Integration in completion, orthogonal system, Integration in completintegral, Cauchy's integral theorem, Cauchy's theorem on multiply connected region residue theorem. (12 Hrs)	
Unit-II	:	Application of Complex Variab	le:	
		Evaluation of real integrals: Integ semi-circle, Conformal Transform	gration along unit circle and along the upper half nation, Bilinear transformation. (5 Hrs)	
Unit-III	:	Vector Integration:		
		Line integral, Surface integral, Green's theorem.	Gauss divergent theorem, Stoke's theorem (7 Hrs)	
Unit-IV	:	Numerical Method:		
		Lagrange's interpolation, Soluti Elimination method, Gauss-Sei	cendental equation, Newton Raphson method on of linear simultaneous equation by Gaus del method, Solution of ordinary differential Fourth order Runge-Kutta method.(10 Hrs)	
Unit-V	:	Probability Introduction, Probability Distribution, Normal Distribution	stribution: Binomial Distribution, Poisson. (6 Hrs	
Unit-VI	:		mentary function, properties of Z-transformtion method, inversion integral method (Residucquation by using Z-transform. (8 Hrs	

Reference	:	1. A Text Book of Applied Mathematics Volume-III BY P.N. Wartikar
Books:		J.N.Wartikar, Pune VidyarthiGrihaPrakashan.
		2. Advanced Engineering Mathematics BY H. K. Dass, S. Chand and Co. Ltd.
		3. Higher Engineering Mathematics BY Dr. B. S. Grewal, Khanna Publishers.
		4. Higher Engineering Mathematics BY B. V. Ramana, Tata McGraw-Hill
		Publishing Co. Ltd.
		5. Solution to Higher Engineering Mathematics Volume –III BY C. P. Gandhi

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

- 1. Minimum ten questions
- 2. Five questions in each section
- 3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

_		BabasahebAmbedkar Marathwa (Faculty of Science and abus of S.Y.B. Tech. (Computer Science):: CSE 252	nd Technology)
	y: al:	g Scheme:04 Hours per week 04 Hours per week : NA	Paradigm Class Test: 20 Theory Examination (Duration): 03 Hrs Theory Examination (Marks): 80
Course Objectives	2 [nl:	. To Explore the Principles of Object Co. To Understand Object-Oriented Conderitance and Polymorphism To Use the Object-Oriented Paradign To Lay a Foundation for Advanced P	cepts such as Data Abstraction, Encapsulation, in Program Design.
Unit-I	:	History and Features: Need Of Ob Oriented Programming (POP) Ver Features of Object Oriented Paradigr Beginning With C++: Keywords, V Resolution Operator, Memory Ma	Programming: ject-Oriented Programming (OOP), Procedure rsus Object Oriented Programming (OOP), m— Merits and Demerits of OO Methodology. Variables, Constants, Basic Data Types, Scope nagement Operators, Operator and Control ents in C++, Structure of C++ Program.
Unit-II	:	Classes and Objects: Introduction, Class Specification, Specifiers, Creating Objects, Memo	Member Function Specification, Access ry Allocations for Objects. Array of Objects, tic Data Members, Static Member Function, estructors. (08 Hrs)
Unit-III	:	Introduction, Defining a Derived Cl Private Inheritance. Types Of Inheritance:	ass, Visibility Modes and Effects. Public And Single Inheritance, Multilevel erarchical Inheritance, Hybrid Inheritance, 8 Hrs)
Unit-IV	:	Polymorphism: Introduction, Types Of Polymorphism Compile Time Polymorphism: For Overloading Unary Operators and Overloading.	
Unit-V	:	Pointers in C++: Pointer Declaration Arithmetic. Dynamic Memory Allocation Pointers and Arrays, Pointer to Objectived Class.	n, Pointer Operator, Address Operator, Pointer ation / Deallocation operators:-new and delete. ect: Pointer to Object, this Pointer, Pointer to Templates, Function Templates, Member
Unit-VI	:	File Processing and Exception Han Stream And Files, Stream Classes, T Closing a File, Reading and Writing File Modes, File Pointers.	Idling: The istream and Ostream Classes, Opening and Character From a File, Detecting End Of File, Exception Handling, Types of exceptions,

		Exception Handling Mechanism, Throwing and Catching Mechanism, Rethrowing
		an Exception.(08Hrs)
Reference	••	1. Herbert Schildt, C++ The Complete Reference, 4Th Edition, Tata
Books:		Mcgraw Hill, 2004
		2. E Balagurusamy, Object Oriented Programming With C++, 5Th Edition,
		Tata Mcgraw Hill.
		3. Robert Lafore, Object Oriented Programming In C++, 4Th Edition,
		Pearson Education
		4. B. Stroustrup, C++ Programming Language, 3rd Edition, Pearson
		Education, 1997,
		ISBN $0 - 201 - 32755 - 4$.
		5. SauravSahay, Object Oriented Programming With C++, 3Rd Edition, ,
		Oxford
		6. Coohoon and Davidson, C++ Program Design: An introduction to
		Programming and Object- Oriented Design (3rd edition), Tata McGraw
		Hill, New Delhi, 2003.

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

- 1. Minimum ten questions.
- 2. Five questions in each section.
- 3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr.BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of S. Y. B. Tech. (Computer Science and Engineering) Semester-IV Code No.: CSE 253 Course: Database Management System

Teaching Scheme: 04Hrs/week Class Test: 20

Theory: 04Hrs/week Theory Examination (Duration): 03 Hrs

Tutorial: NA Theory Examination (Marks): 80

Credits:04

Creur	Credits:04		
Course	1. To learn and understand database system architecture and applications.		
Objectives	2. To understand the skills to model data requirements using ER diagrams for		
	information management.		
	3. To learn that how to organize, maintain, retrieve information efficiently from		
	dbms.		
	4. To familiarize with the basic issues of transaction processing and file organization.		
Unit-I	: Introduction :		
	Introduction to database, Database Management System, DBMS Applications,		
	advantages of a database system over file system, view of data: data abstraction,		
	Instance and schema, data models, Data independence, database languages, actors		
	on the scene and workers behind the scene, overall structure of a DBMS, database		
	application architectures, centralized and client server architecture for dbms.		
	(08 Hrs)		
Unit-II	: Data Modeling: Basic Concepts, relational model: relation, tuple, field, cardinality		
	and arity of relation, Entity Relationship Model: entity, entity set, types of		
	attributes, relationships, relationship sets, constraints, keys, weak entity sets, E-R		
	diagrams: Components of E-R Model, conventions, enhanced ER model,		
	relational database design using ER to relational mapping.		
	(08 Hrs)		
Unit-III	: Relational Database Design		
	Normalization, Need of Normalization, Functional Dependencies, Normal forms		
	1NF, 2NF, 3NF, BCNF, multi valued functional dependency and 4NF, properties of		
	relational decompositions. (08 Hrs)		
Unit-IV	: Structured Query Language:		
	Introduction of SQL, SQL Data Types, Data Definition Language, integrity		
	constraints, Data Manipulation Language, Data Control Language, SQL Operators,		
	Aggregate Functions, Grouping, Sub Queries, Views, Joins, Set Operations		
	(08 Hrs)		
Unit-V	: Transactions:		
	Transaction concept, ACID properties, transaction states, serializability, transaction		
	isolation and durability.		
	Concurrency control:		
	Lock based protocols, deadlock handling, time-stamp based protocols.		
	Recovery system:		
TT .*4 X7T	Recovery concept, recovery techniques, shadow paging.(08 Hrs)		
Unit-VI	: File organization, indexing and hashing		
	File Organization, Organization of records in files, types of indices, Static and		
Deference	Dynamic Hashing. (08 Hrs) 1. Silberschatz A., Korth H., Sudarshan S., "Database System Concepts", 5th		
Reference Books:	1. Silberschatz A., Korth H., Sudarshan S., "Database System Concepts", 5th Edition, McGraw Hill Publishers, 2002, ISBN 0-07-120413-X.		
Books:			
	2. Elmasri R., Navathe S., "Fundamentals of Database Systems", 4* Edition, Pearson Education, 2003, ISBN 8129702282.		
	3. Rab P. Coronel C. "Database Systems Design, Implementation and Management", 5 th Edition, Thomson Course Technology, 2002, ISBN 981-		
	243-135-7.		
	4. Connally T., Begg C., "Database Systems", 3rd Edition, Pearson Education,		

- 2002, ISBN 81-7808-861-4
- 5. Date C., "An Introduction to Database Systems", 7th Edition, Pearson Education, 2002, ISBN 81-7808-231-4.
- 6. Ramkrishna R., Gehrke J., "Database Management Systems", 3rd Edition, McGraw-Hill, 2003, ISBN 0-07-123151 –X
- 7. AtulKahate, "Introduction to Database Management System", 3rd Edition, Pearson Education 2009, ISBN 978-81-317-0078-5.
- 8. "SQL Complete Reference", By James R Groff, Paul N. Weinberg and Andy Oppel, 3rdEdition, McGraw Hill Publishers, ISBN: 9781259003882

Section A: Includes Unit I, II and III; **Section B**: Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

- 1. Minimum ten questions.
- 2. Five questions in each section.
- 3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

	Dr. BabasahebAmbedkar Marathwada University, Aurangabad		
(Faculty of Science and Technology)			
Syllabus of S.Y.B. Tech. (Computer Science and Engineering) Semester-IV			
	Code No.: CSE254		Course: Computer Organization
_		eme:04 Hours per week	Class Test: 20
	•	03 Hours per week	Theory Examination (Duration): 03 Hrs
Tutor Credi		01 Hr per week	Theory Examination (Marks): 80
Course		To learn the basics of computer arithmetics	hmetic
Objectives		To learn the processor basics.	miletic.
Objectives		To learn the RISC and CISC archite	cture
		To learn the pipelining.	ettire.
Unit-I	:	Introduction	
	•		iter Architecture, 1's and 2's complement
		addition and subtraction, Booth's a	
Unit-II		Processor	
0			s, ALU and Control Unit, Instruction Cycle,
			eration, Pentium IV Processor.(08 Hrs)
Unit-III	:	Control Unit Design	
		CPU with internal bus, RISC and	CISC architecture, Micro programmed Control
		Unit, Hardwired control Unit. (08 I	Hrs)
Unit-IV	:	Memory Organization	
			Memory, Types, Background, Levels of Cache,
			g method of cache, Memory Management unit,
		concept of virtual memory.(08 Hrs	s)
Unit-V	:	Pipelining	
			g, Performance, Data Hazards, Types, Stalling,
		Data Dependency. (08 Hrs)	
Unit-VI	:	Advanced Processors	
			eatures, Comparison, Internal Architecture of new
D. C		processors, Advantages and Disadv	
Reference	:		Organization" By SubrataGhoshal, Pearson
Books:		publication. 2 "Computer A rehitecture and or	ganization", BY John P. Hayes. McGrawHill
		publication.	gamzauon ,b i joini r. nayes. McGiawfill
		publication.	

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

"Computer Organization", BY Hamachaer and Zaky, McGraw Hill publication.

For 80 marks Paper:

- 1. Minimum ten questions
- 2. Five questions in each section
- 3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Note: 12 Tutorials should be based on above syllabus

Dr.BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of S.Y.B. Tech. (Computer Science and Engineering) Semester-IV

Code No.: CSE291 Course: Elective-I(Multimedia

Techniques)

Teaching Scheme:04 Hours per week Class Test: 20

Theory: 04 Hours per week
Credits:04

Theory Examination (Duration): 03 Hrs
Theory Examination (Marks): 80

~		
Course		. To introduce the students the characteristics and design methodologies of
Objective		
S		2. To focus on content creation for the web and multimedia.
	3. To expose students to theoretical and fundamental concept of multimedia, its	
		dication and the techniques involved.
		To help student learn the issues involved in capturing, processing, manipulating,
		oringand retrieving various kinds of continuous media.
		6. To learn different data compression techniques.
	6	. To understand multimedia networking concepts.
Unit-I	:	Multimedia An Overview: Introduction to multimedia, Multimedia presentation
		and production, Characteristics of multimedia presentation, Hardware and Software
		requirement, Uses of multimedia, steps for creating multimedia presentation, Analog
		Representation and Digitization, Visual display system: CRT, Plasma display panel,
		LED.(08 Hrs)
Unit-II	:	Text, Images : Text: Types of text, font, text compression, text file formats: txt, doc,
		docx, ps, and pdf, File Headers Images: Image data representation, Image
		Acquisition – Flat bed Scanner and Digital Camera, Image processing overview,
		Color Management Systems- RGB and CMYK, Image File Formats- bmp, jpeg, tiff
		and png, File Headers. (08 Hrs)
Unit-III	:	Audio And Video Technology: Audio Technology: Audio Acoustics, Nature of
		Sound Waves, Types and properties of sounds- music, Noise, Tone, and Rhythm,
		Musical Note and Pitch, Components of Audio System- Microphone, Amplifier,
		Loudspeaker and Audio Mixer, MIDI and their connections, Audio file format-WAV,
		MID, AU, MP3 and WMA. Audio File Headers Video Technology: Concepts of
		Video, Analog Video Camera, Television Broadcasting Standards, Video File
		Formats- AVI, MOV, WMV, File Headers (08 Hrs)
Unit-IV	:	Data Compression: Types of compression, Lossless Compression Techniques-
		Run-length Coding, Huffman Coding, Lossy Compression Techniques- JPEG,
		MPEG-1 Video. (08 Hrs)
Unit-V	:	Animation: Uses of Animation, Keyframes and Tweening, Principles of animation,
		Flipbook animation, 2D animation, 3D animation, Camera animation, Cel animation,
		Path animation, and Animation file formats.
		(08 Hrs)
Unit-VI	:	Multimedia Network Communication: Multimedia Network Communication,
		Networks and Network Services, Multimedia Sources, Source and Destination
		Terminals, Application-Video Streaming to multiple users, Video Conferencing,
		Media-on-Demand- Interactive TV(ITV) and Set-Top Box(STB), Multimedia over
		Wireless Networks, Trends in Wireless Interactive Multimedia, Voice Over IP.(08)
		Hrs)
Referenc	:	1) Ranjan Parekh, "Principles of Multimedia", Tata McGraw Hill, Second
e Books:		Edition.
		2) Halshall, "Multimedia communications", Pearson education. 5 th edition

2011.
3) Ralf Steinmetz and KlaraNahrstedt, "Multimedia Fundamentals: Media
Coding and Content Processing", Vol. 1, Pearson Education
4) Jerry D. Gibson, "Multimedia Communication, Directions and Innovations",
Academic Press, Hardcourt India.2001
5) Ze-nian, Mark S. Drew, "Fundamentals of Multimedia", PHI
6) K.R.Rao , D.Milovanovic, "Multimedia communication systems:
Techniques, standards and networks", Pearson Education 2002

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

- 1. Minimum ten questions.
- 2. Five questions in each section.
- 3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Syllabus of S.Y.B. Tech. (Computer Science and Engineering) Semester-IV Code No.: CSE292 **Course: Elective-I (Human Computer** Interface) **Teaching Scheme:04 Hours per week** Class Test: 20 Theory: 04 Hours per week Theory Examination (Duration): 03 Hrs **Tutorial: NA Theory Examination (Marks): 80** Credits:04 After successfully completion of this course, students should be able to: Course **Objectives** 1. Understand the importance of good interface design for human computer interaction 2. Understand users and their interaction with the computers. 3. Understand and apply design principles, models and evaluation techniques to user interface design. 4. Identify features of groupware and different computing environments Develop a real application to demonstrate the knowledge of design, research and development issues related to HCI **Introduction:** The human, The computer, The interaction, Paradigms, Usability of Unit-I Interactive Systems, Guidelines, Principles, and Theories, Importance of good design Examples how designs failed a product Identifying good vs bad design (08 Hrs) **Design Process:** Interaction design basics, HCI in the software process, Design **Unit-II** rules, Implementation support, Evaluation techniques, Universal design, User support, User centred Design: What, Why, When to use, Examples, (08 Hrs) Models and Theories: Cognitive models, Socio-organizational issues Unit-III stakeholder requirements, Communication and collaboration models, Task analysis, Dialogue notations and design, Models of the system, Modeling rich interaction (08 Hrs) **Unit-IV** Interaction Styles: Direct Manipulation and Virtual Environments, Menu Selection, Form Filling and Dialog Boxes, Command and Natural Languages, Interaction Devices, Collaboration and Social Media Participation (08 Hrs) Unit-V Design Issues: Quality of Service, Balancing Function and Fashion, User Documentation and Online Help, Information Search, Information Visualization (08 Hrs) : Outside the Box: Group ware, Ubiquitous computing and augmented realities, Unit-VI Hypertext, multimedia, and the world wide web(08 Hrs) : 1,"Human Computer Interaction" by Alan Dix, Janet Finlay Reference :9788131717035, Pearson Education (2004) Third Edition. **Books:** 2. "Designing the User Interface - Strategies for Effective Human Computer Interaction", by Ben Shneiderman ISBN: 9788131732557, Pearson Education (2010) Fifth Edition 3."Interaction Design: beyond Human Computer Interaction"byhelen sharp, rogers, preece, wiley publications. Third Edition.

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Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

- 1. Minimum ten questions.
- 2. Five questions in each section.
- 3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. BabasahebAmbedkar Marathwada University, Aurangabad (Faculty of Science and Technology) Syllabus of S.Y.B. Tech. (Computer Science and Engineering) Semester-IV Code No.: CSE293 **Course: Elective-I(Principles of Programming Languages**) **Teaching Scheme:04 Hours per week** Class Test (Marks): 20 Theory: 04 Hours per week Theory Examination (Duration): 03 Hrs **Tutorial: NA** Theory Examination (Marks): 80 Credits:04 1. To understand theoretical concepts of programming languages. Course 2. To understand syntax and semantics of programming languages. **Objective** 3. To understand the ideas of design and implementation of programming languages. 4. To understand Programming language paradigms. Unit-I Introduction History of Programming Languages, Features of good Language; Language Design Issues- Structure and Operation of Computer, Virtual Computers and Binding Times, Language Paradigms; Language Translation Issues- Programming Language Syntax, Stages in Translation, Formal Translation Models. (08Hrs)Unit-II **Syntax and Semantics** Language definition, Syntax: abstract syntax, concrete syntax, and pragmatics, Semantics: An introduction to formal semantics, languages, language processing, interpretation, translation, the concept of binding, variables, name and scope, Type, l-value, r-value, reference and unnamed variables, routines, generic routines, aliasing and overloading, an abstract semantic processor, run time structure. Case study- run time structure of C(08Hrs) Unit-III **Sequence Control** Implicit and Explicit Sequence Control, Sequencing with Arithmetic Expressions, Sequencing with Non arithmetic Expressions, Sequence Control between Statements (08 Hrs) **Unit-IV Subprogram and Implementations** Fundamentals of Subprograms, Scope of Lifetime of variables, Local referencing ,Parameter passing, Subprogram Sequence Control, Attributes of Data Control, Shared Data in Subprograms, Implementing simple subprograms. (08 Hrs) Unit-V **Advanced Issues in Language Design** Variation on Subprogram Control, Parallel Programming; Formal ☐ Properties of Semantics, Hardware Developments, languages, Language and Software Architecture.(08 Hrs) Unit-VI **Programming Paradigms** Introduction to programming paradigms, Introduction to four main Programming paradigms- procedural, object oriented, functional, and logic and rule based, Markup languages, Query Languages. Case Study of C/C++, Java, XML, SQL.(08 Hrs) Reference [1] T. W. Pratt, M. V. Zelkowitz, Programming Languages: Design and Implementation, **Books:**

4/e, Pearson Education, 2000.
[2] D. P. Friedman, M Wand, Essentials of Programming Languages, 3/e, MIT Press,
2008.
[3] R. W. Sebesta, Concepts of Programming Languages, 8/e, Addison Wesley, 2008.
[4] Carlo Ghezzi, Mehdi Jazayeri, Programming Language Concepts,3rd Ed, Wiley
Publication ISBN: 978-81-265-1861-6.

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

- 1. Minimum ten questions.
- 2. Five questions in each section.
- 3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve

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(Faculty of Science and Technology)

Syllabus of S.Y.B. Tech. (Computer Science and Engineering) Semester-IV

Code No.: CSE256 Course: Web Programming

Teaching Scheme:02 Hours per week Class Test: 10

Theory: 02 Hours per week Theory Examination (Duration): 02 Hrs

Tutorial: NA Theory Examination (Marks): 40

Credits:02

	-	3.02
Course	:	1. Discuss the concepts of PHP and its advantages over other languages
Objecti		2. Using decision control structures and looping control structures to process
ves		statements, also Creating arrays
		3. How to manipulate strings in PHP using the built-in functions
		4. Creating Simple HTML and PHP page and Work with form data
		5. Use cookies and sessions
		6. Using SQL to SELECT, INSERT, UPDATE and DELETE data from tables
Unit-I	:	Introduction to PHP: PHP Introduction, Advantages of PHP, Characteristics of PHP,
		Common uses of PHP, How PHP scripts work, PHP Environment Setup, PHP Syntax
		Overview, Creating Simple HTML and PHP page.
		Building blocks of PHP: Basic syntax, Variables, Data Types, Operators and
		expressions, Constants.
		(04 Hrs)
Unit-II	:	PHP Decision and Looping :PHP IfElse, The ElseIf Statement, PHP Switch, PHP
		Looping- The while loop statement, The dowhile loop statement, The foreach loop
		statement, The break and Continue statement.
		PHP Arrays - Numeric Array, Associative Arrays, Multidimensional Arrays.
		(04 Hrs)
Unit-III	:	PHP Functions: Function, Calling Function, Defining Function, Returning the Values
		from userdefined function, Variable Scope, Argument.
		Working with Strings, Date and Time Functions: Formatting String with PHP, Date
		and Time Function, String Manipulation .(04 Hrs)
Unit-IV	:	Working With Forms: Creating form, Using \$_GET and \$_POST for handling
		form, Validating form data, Accessing form data, use of Hidden
		fields to save State, Redirecting user.
		PHP File Handling: File Inclusion - Include() Require(), Opening a File, Closing a
		File, Check End-of-file, Reading a File Line by Line, Reading a File Character by
		Character.
		(04 Hrs)
Unit-V		Working with Cookies and User Session:
CIIIt- V	•	Introduction of Cookie, Setting a Cookie with PHP, Introduction of Session, creating a
		Session, Working with Session Variables, Passing Session Id in the query String,
		Destroying Session .
		Error Handling and Debugging:
		General error types and debugging, displaying PHP errors, Adjusting Error Reporting,
		Creating Custom error handler, PHP debugging techniques.
		(04 Hrs)
Unit-VI		Using MySQL with PHP: Connecting to MySQL and selecting the database,
Omt-VI	•	executing simple queries, retrieving query results, counting return Records, updating,
		Record Addition, Viewing Record, and Deletion Record with PHP.MYSQL Error
		Handling: SQL and MySQL debugging techniques.
		(04 Hrs)

Referen	: 1. PHP and MySQL for dynamic Web Sites: Visual Quickpro Guide, Second Edition by
ce	Larry.
Books:	Programming PHP By RasmusLerdorf, Kevin Tatroe, PeterMacIntyre.
	2. The Complete Reference PHP By Steven Holzner
Text	1. Begging PHP 5 by Wrox.
Books :-	2. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach Yourself, Pearson
	Education.

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

- 1. Minimum eight questions.
- 2. Four questions in each section.
- 3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for six marks each. The Question no.1 and 5 should be of objective nature.
- 4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

Dr. BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of S.Y. B. Tech. (Computer Science and Engineering) Semester- IV

Code No.: CSE271 Course: Lab I: Object Oriented Programming

Paradigm

Termwork :25 marks

Practical: 02 Hours per week
Credits:01

Practical:25 marks
Total Examination (Marks): 50 marks

Course	:	1. The aim of this course is to teach the principles underlying Object Oriented
Objective		Programming through C++.

2. To increase reusability in programming.

3. To reduce the costs of developing and adapting software to meet new requirement

List of Practical s (Minimu m ten experime nts to be performe d)

- 1. Develop a program to declare a class 'person' having data members name, age and salary. Accept and display this data for one object.
 - 2. Write a program to declare a class 'employee' having data members name and age. Accept and display the data for three objects.
 - 3. Programs to Understand Friend Function and Friend Class. a. Friend Function b. Friend class
 - Write a program to accept five different numbers by creating a class called friendfunc1 and friendfunc2 taking 2 and 3 arg respectively and calculate the average of these numbers by passing object of the class to friend function.
 - Write a program to accept the student detail such as name and 3 different marks by get_data() method and display the name and average of marks using display() method. Define a friend class for calculating the average of marks using the method mark_avg().
 - 4. Write a program to demonstrate how an object can be made an argument of a function
 - 5. Constructors and Destructors.
 - Create a class for counting the number of objects created and destroyed within various block using constructor and destructors.
 - 6. Programs to Understand Storage Specifiers.
 - Write a C++ program to demonstrate the static and non static variable usage defining them within a function.
 - 7. Programs to Overload Unary and Binary Operators as Member Function and Non Member Function. a. Unary operator as member function b. Binary operator as non member function
 - Write a C++ program to count the number of persons inside a bank, by increasing count whenever a person enters a bank, using an increment (++) operator overloading function, and decrease the count whenever a person leaves the bank using a decrement(--) operator overloading function inside a class.
 - Write a C++ program to create two objects of a class called company and add their data members using an operator overloaded function for '+' operator and '-'operator.
 - 8..Program for different types of inheritance (Simple, Multiple, Hierarchical, Multilevel)

9. Write a program to display the output using virtual function. 10. Write a program for abstract class. 11. Use of "this" Pointer. Using class Write a C++ program to create three objects for a class named pntr obj with data members such as roll noand name. Create a member function set_data() for setting the data values and print() member function to print which object has invoked it using 'this' pointer. 12. Write a program to evaluate the largest number of an array using pointer 13. Show the Implementation of exception handling. 14. Programs on Class Templates Write a program to explain class template by creating a template T for a class named pair having two data members of type T which are inputted by a constructor and a member function get-max() return the greatest of two numbers to main. Note: the value of T depends upon the data type specified during object creation. 15. Program for creating, opening, closing, reading and writing a file. List of :

Referenc e Books

- 1. Herbert Schildt, C++ The Complete Reference, 4Th Edition, Tata Mcgraw Hill,
- 2.EBalagurusamy, Object Oriented Programming With C++, 5Th Edition, Tata Mcgraw Hill.
- 3. Robert Lafore, Object Oriented Programming In C++, 4Th Edition, Pearson Education
- 4.B. Stroustrup, C++ Programming Language, 3rd Edition, Pearson Education,

ISBN 0 - 201 - 32755 - 4.

5. Saurav Sahay, Object Oriented Programming With C++, 3Rd Edition, Oxford 6.Coohoon and Davidson, C++ Program Design: An introduction to Programming and Object- Oriented Design (3rd edition), Tata McGraw Hill, New Delhi, 2003.

The assessment of term work shall be done on the basis of the following.

- Continuous assessment.
- Performing the experiments in the laboratory.
- Oral examination conducted on the syllabus and term work mentioned above.

Dr.BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of S. Y. B. Tech. (Computer Science and Engineering) Semester-IV

Code No.: CSE272 Course: Database Management System

Term Work: 25 Marks Practical: 25 Marks

Credits:01 Total Examination Marks: 50

Course	:	1. To get familiar with the concept of SQL.
Objectives		2. To understand data definition language.
		3. To have knowledge of data manipulation language.
		4. To learn and understand the concept of views.
List of	:	Creation of Database from ER Model
Practical's		2. Retrieving data using SQL select statement
(Minimu		3. Restricting and sorting data
m ten		4. Reporting aggregated data using the group functions
experimen		5. Displaying data from multiple tables using Joins
ts to be		6. Using sub queries to solve queries
performe		7. Using set operators
d)		8. Manipulating data
		9. Using DDL statements to create and mange tables
		10. Restrict user access using DCL Statements
		11. Implementation of Views
Reference	:	1. "Database System Concepts", BY Silberschatz A., Korth H., Sudarshan S., 5th
Books		Edition,
		McGraw Hill Publishers, 2002, ISBN 0-07-120413-X.
		2. "Fundamentals of Database Systems", BY Elmasri R., Navathe S., 4th Edition,
		Pearson
		Education, 2003, ISBN 8129702282.
		3. "SQL Complete Reference", By James R Groff, Paul N. Weinberg and Andy
		Oppel, 3rd Edition, McGraw Hill Publishers, ISBN: 9781259003882

The assessment of term work shall be done on the basis of the following.

1. Continuous assessment.

Practical: 02Hrs/week

- 2. Performing the experiments in the laboratory.
- 3. Oral examination conducted on the syllabus and term work mentioned above.

Dr. BabasahebAmbedkar Marathwada University, Aurangabad (Faculty of Science and Technology) Syllabus of S.Y. B. Tech. (Computer Science and Engineering) Semester- IV Code No.: CSE273 Course: Computer Laboratory II (Python Practical: 02 Hours per week **Programming**) Term work :25 marks Credits:01 Practical:25 marks **Total Examination (Marks): 50 marks** 1.Learn core Python scripting elements such as variables and flow control structures Course 2. Discover how to work with lists and sequence data **Objective** 3. Write Python functions to facilitate code reuse 4. Use Python to read and write files List of 1. Write a simple program based on Python Keywords and Identifier, Statements and Practical Comments, Python Datatypes, Python Operators. 2. Python Flow Control (Python if...else, Python for Loop, Python while Loop, (Minimu Python break and continue, Python Pass) m ten 3. Write a Python Program to Make a Simple Calculator using functions. experime 4. Write a program for Python Tuple and learn methods nts to be 5. Write a Python Program to Add Two Matrices using Python List performe 6. Write a Python Program to Display Calendar d) 7. Write a program to create, access, add and remove elements from python dictionary 8. Write a Python Program to Illustrate Different Set Operations 9. Write a Python Program to Sort Words in Alphabetic Order 10. Write a program exception handling in Python applications for error handling. 11. Write a program in python to use class inheritance in Python for reusability. 12. Write a program to Search text using regular expressions Programming with Python: A Users Book" by Dawson Michael List of

The assessment of term work shall be done on the basis of the following.

3. Core Python Programming Wesley J. Chun

1. Continuous assessment.

Referenc

e Books

- 2. Performing the experiments in the laboratory.
- 3. Oral examination conducted on the syllabus and term work mentioned above.

2. "Python: The Complete Reference" by Martin C. Brown

Dr. BabasahebAmbedkar Marathwada University, Aurangabad

(Faculty of Science and Technology)

Syllabus of S.Y. B. Tech. (Computer Science and Engineering) Semester- IV

Code No.: CSE 274 Course: Web Programming

Termwork:50 marks

Practical: 02 Hours per week Practical:NA

Credits:01 Total Examination (Marks):50

C		1 To annual full health interesting that this party and
Course	:	1. To successfully build interactive, data-driven web pages.
Objective		2. Using PHP to manipulate files
S		3. Using the phpMyAdmin utility to administer the MySQL database
List of	:	1) Create a simple HTML form and accept the user name and display the name
Practical		through PHP echo statement.
S		2) Develop a program on PHP conditional statments
(Minimu		3) Develop Program on PHP Looping.
m ten		4) Develop program using PHP Arrays (All Types)
experime		5) Develop Program on PHP String and PHP Functions.
nts to be		6) a) Create a PHP Form, use PHP \$_GET and PHP \$_POST method to accepet
performe		data b) Form Validation in PHP: Validate contents in above form:
d)		7) Develop program for file handling (openning, reading and writting into
		files)
		8) Develop a PHP program to store current date-time in a COOKIE and display
		the 'Last visited on' date-time on the web page upon reopening of the same
		page.
		9) Develop a PHP program to store page views count in SESSION, to increment
		the count on each refresh, and to show the count on web page.
		10) Write a PHP script to insert a string at the specified position in a given string.
		Go to the editor
		Original String: 'The brown fox' Insert 'quick' between 'The' and 'brown'.
		Expected Output: 'The quick brown fox'
		11) Introduction to MySQL, PHP - SQL Database connectivity, small example.
		12) Using PHP and MySQL, develop a program to accept book information.
		Accession number, title, authors, edition and publisher from a web page and
		store the information in a database and to search for a book with the title
		specified by the user and to display the search results with proper headings.
List of	:	1) PHP and MySQL for dynamic Web Sites: Visual Quickpro Guide, Second
Referenc		Edition by Larry.
e Books		2) Programming PHP ByRasmusLerdorf, Kevin Tatroe, Peter MacIntyre.
		3) The Complete Reference PHP By Steven Holzner
		4) Begging PHP 5 by Wrox.
		5) Julie C. Meloni, PHP MySQL and Apache, SAMS Teach Yourself, Pearson
		Education.
N		

The assessment of term work shall be done on the basis of the following.

- 1. Continuous assessment.
- 2. Performing the experiments in the laboratory.
- 3. Oral examination conducted on the syllabus and term work mentioned above.

Dr. BabasahebAmbedkar Marathwada University, Aurangabad (Faculty of Science and Technology) Syllabus of S.Y. B. Tech. (Computer Science and Engineering) Semester- IV **Course: Development of Skills III (Technical report** Code No: CSE275 writing) Term work:50 marks Practical: 02 Hours per week **Total Examination: 50 marks** Credits: 01 1.To study ethicalities, good practices and techniques of technical document writing. Course **Objective** 2.To study document authoring tools such as Microsoft Word, Apple Pages, LibreOffice Writer and Latex. 3.To study and design various types of technical documents. 4.To be able to communicate technical information through different documents and List of 1.To study the Basic concepts, Aspects, Ethicality, Legal issues and Significance of technical document writing. **Practical** 2. To study LateX and its features to design a summary report of any one IEEE paper. 3.To study following types of technical documents: A) An algorithm and an equivalent C program Instructions. B) Mini Research Project Proposal. C) MOU (Memorandum of understanding between software developer and customer) D) One page Summary of a Case Study. 4.To create a document, containing proof of a derivation that includes mathematical equations, using Latex. 5.To write 'Help' file of any Technical Software using LateX/MsWord. 6.To create an abstract of a thesis report using MsWord References tool, Citation Tool, Style, Manage Resources and Bibliography Tool, also use Header and Footer Tool. 7.To Create a PowerPoint presentation using beamer in LateX. 8. Study write up report on Technical Document Authoring Tools Microsoft Word • Macromedia RoboHelp • Adobe FrameMaker • 9. Study write up report on Technical Document Authoring Tools Snag IT • Ms Visio • PowerPoint • Photoshop 10.Mini Project Report: To design and submit a Mini Project summary Report(min 25 pages) of any thesis report from BE/ME using LateX that includes Image, different fonts, sizes, Index, Table of Figures, Table of Tables, bibliography etc. 1. Technical and professional writing by Herman A. Estrain List of 2. English for engineering students by G. V. L. N. Sharma Referenc 3. Practical Latex by George Gratzer , Springer e Books 4. Latex Beginners Guide by Steffen Kottwitz,

The assessment of term work shall be done on the basis of the following.

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