

# Course Structure and Syllabus

## II BTech CSE I Semester

*(From the admitted batch of 2016 – 2017 under CBCS Scheme)*

Sub Code	Subject	Hrs/Week		Max Marks		Total Marks	Credits
		Theory	Lab	Internal	External		
BTCSE301	DIGITAL LOGIC DESIGN	4	--	25	75	100	4
BTCSE302	OPERATING SYSTEMS	4	--	25	75	100	4
BTCSE303	OBJECT ORIENTED PROGRAMMING USING C++	4	--	25	75	100	4
BTCSE304	ADVANCED DATA STRUCTURES	4	--	25	75	100	4
BTCSE305	PROBABILITY, STATISTICS AND QUEUING THEORY	4	--	25	75	100	4
BTCSE306	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	4	--	25	75	100	4
BTCSE307	OPERATING SYSTEMS LAB	-	3	50	50	100	2
BTCSE308	OOP USING C++ LAB	--	3	50	50	100	2
<b>TOTAL</b>		<b>24</b>	<b>6</b>	<b>250</b>	<b>550</b>	<b>800</b>	<b>28</b>

## **BTCSE301: DIGITAL LOGIC DESIGN**

**Theory : 4 Hrs/week**

**Credits : 4**

**Int Marks : 25**

**Ext Marks : 75**

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### **UNIT-I**

**Digital Systems:** Binary Numbers, Octal, Hexa Decimal And Other Base Numbers, Number Base Conversions, Complements, Signed Binary Numbers, Floating Point Number Representation, Binary Codes, Error Detecting And Correcting Codes, Digital Logic Gates (AND, NAND, OR, NOR, Ex-OR, Ex-NOR), Boolean Algebra, Basic Theorems and Properties, Boolean Functions, Canonical and Standard Forms.

### **UNIT-II**

**Logic Gates:** Gate –Level Minimization and Combination Circuits, The K-Maps Methods, Three Variable, Four Variable, Five Variable, Sum of Products, Product of Sums Simplification, Don't Care Conditions, NAND and NOR Implementation and Other Two Level Implementation.

### **UNIT-III**

**Combinational Circuits (CC):** Design Procedure, Combinational Circuit for Different Code Converters and Other Problems, Binary Adder, Subtractor, Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, Demultiplexers.

### **UNIT-IV**

**Synchronous Sequential Circuits:** Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, Design of Counters, Up-Down Counters, Ripple Counters , Registers, Shift Registers, Synchronous Counters

**Asynchronous Sequential Circuits:** Reduction of State And Follow Tables, Role Free Conditions

#### **TEXT BOOK:**

1. Digital Design- M. Morris Mano.

#### **REFERENCE BOOKS:**

1. Switching and Finite Automata Theory by Zvi. Kohavi, Tata McGraw Hill.
2. Switching and Logic Design, C.V.S. Rao, Pearson Education.
3. Digital Principles and Design – Donald D. Givone, Tata McGraw Hill, Edition.
4. Fundamentals of Digital Logic & Micro Computer Design, 5TH Edition, M. Rafiquzzaman John Wiley.

## BTCSE302: OPERATING SYSTEMS

**Theory** : 4 Hrs/week

**Credits** : 4

**Int Marks** : 25

**Ext Marks** : 75

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### UNIT – I

**Introduction:** Operating system and functions, Classification of Operating systems- Batch, Interactive, Time sharing, Real Time System, Multiprocessor Systems, Multiuser Systems, Multiprocess Systems, Multithreaded Systems, Operating System Structure- Layered structure, System Components, Operating System services.

**Concurrent Processes:** Process Concept, Principle of Concurrency, Producer / Consumer Problem, Mutual Exclusion, Critical Section Problem, Semaphores; Classical Problem in Concurrency- Dining Philosopher Problem, Process Communication models and Schemes, Process generation.

### UNIT – II

**CPU Scheduling:** Scheduling Concepts, Performance Criteria, Process States, Process Transition Diagram, Schedulers, Process Control Block (PCB), Process address space, Process identification information, Threads and their management, Scheduling Algorithms, **Deadlock:** System model, Deadlock characterization, Prevention, Avoidance and detection, Recovery from deadlock.

### UNIT – III

**Memory Management:** Multiprogramming with fixed partitions, Multiprogramming with variable partitions, Protection schemes, Paging, Segmentation, Paged segmentation, Virtual memory concepts, Demand paging, Performance of demand paging, Page replacement algorithms.

### UNIT – IV

**I/O Management and Disk Scheduling:** I/O devices, and I/O subsystems, I/O buffering, Disk storage and disk scheduling, RAID. File System: File concept, File organization and access mechanism, File directories, and File sharing, Filesystem implementation issues, File system protection and security.

### TEXT BOOK:

1. Silberschatz, Galvin and Gagne, “Operating Systems Concepts”, Wiley

### REFERENCE BOOKS:

1. Sibsankar Halder and Alex A Aravind, “Operating Systems”, Pearson Education
2. Harvey M Dietel, “ An Introduction to Operating System”, Pearson Education
3. D M Dhamdhare, “Operating Systems : A Concept based Approach”, McGraw Hill.
4. Charles Crowley, “Operating Systems: A Design-Oriented Approach”, Tata McGraw Hill Education”.
5. Stuart E. Madnick & John J. Donovan. Operating Systems. McGraw Hill.

## **BTCSE303: OBJECT ORIENTED PROGRAMMING USING C++**

**Theory** : 4 Hrs/week

**Credits** : 4

**Int Marks** : 25

**Ext Marks** : 75

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### **UNIT- I**

**Principles of Object Oriented Programming:** Software Evolution, Procedure- Oriented Programming, OOP Paradigm, Basic Concepts and Applications of OOP.

**Beginning with C++:** A Simple C++ Program, Structure of a C++ Program, Creating the Source File, Compiling and Linking.

**Tokens, Expressions and Control Structures:** Tokens, Identifiers and Constants, Basic and User – Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Dereferencing Operators, Memory Management Operators, Manipulators, Type Cast Operator, Expressions and Their Types, Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures.

**Functions In C++:** The Main Function, Function Prototyping, Call By Reference, Return By Reference, Inline Functions, Default Arguments, Const Arguments, Function Overloading, Friend and Virtual Functions, Math Library Functions.

### **UNIT- II**

**Classes and Objects:** A C++ Program with Class and member functions, Inline Functions, Private Member Functions, Arrays within a class, Memory Allocation for Objects, Static Data Members and Member Functions, Arrays of Objects, Object as Function Arguments, Friend Functions, Returning Objects, const Member Functions, Local classes.

**Constructors and Destructors:** Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-Dimensional Arrays, const Objects, Destructors

**Operator Overloading :** Overloading Unary and Binary Operators, Overloading using Friends, String Manipulation Using Operators, Rules for operator Overloading.

### **UNIT- III**

**Inheritance: Extending Classes:** Defining Derived Classes, Single Inheritance, Inheriting a Private Member, Multilevel, Hierarchical and Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes: Nesting of Classes

**Pointers, Virtual Functions and Polymorphism:** Introduction, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

### **UNIT- IV**

**Managing Console I/O Operations:** C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators.

**Working With Files:** Classes for File Stream Operations, Opening and Closing a file, Detecting End-of File, More about Open(): File Modes, File Pointers and their Manipulations, Sequential Input and Output operations, Updating a File: Random Access, Error handling During File Operations, Command-Line Arguments.

**Templates:** Class Templates, Multiple Parameters, Function Templates, Multiple Parameters, Overloading of Template Functions, Member Function Templates

### **TEXT BOOKS:**

1. Object Oriented Programming with C++, 6e by E Balagurusamy, TMH.

### **REFERENCE BOOKS:**

1. Programming: Principles and Practice using C++, Bjarne Stroustrup, Addison-Wesley Professional; 2 edition
2. Mastering C++ KR Venugopal, RajKumar Buyya, 2 Edition, McGraw Hill Education
3. The Complete Reference C++ Herbert Schildt, McGraw Hill Education; 4 edition

## BTCSE304: ADVANCED DATA STRUCTURES

<b>Theory</b>	<b>: 4 Hrs/week</b>	<b>Credits</b>	<b>: 4</b>
<b>Int Marks</b>	<b>: 25</b>	<b>Ext Marks</b>	<b>: 75</b>

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### UNIT-I

**Performance Analysis and Asymptotic Notations:**Space Complexity, Time Complexity, Asymptotic Mathematics, Complexity Analysis Examples.

**Lists, Stacks, Queues:** Implementation of the Stack ADT(Abstract Data Type) and the Queue ADT.

**Skip Lists and Hashing:** Skip List Representation-The Ideal Case, Insertion and Deletions, Assigning, The Class SkipNode and SkipList, Complexity, Hash Table Representation-Ideal hashing, Hashing with Linear open addressing, hashing with chains, An application-Text Compression-LZW Compression, Implementation of LZW Compression, LZW Decompression, Implementation of LZW Decompression.

### UNIT-II

**Trees:** The Search Tree ADT- Binary Search Trees, AVL Trees, Splay Trees, Red Black Trees, B-Trees.

**Priority Queues:** Introduction, Linked Lists, Heaps-Definitions, Insertion into a Max Heap, Deletion from a Max Heap, Applications-Heap Sort, Machine Scheduling, Huffman Codes.

**The Disjoint Set Class:** Equivalence Relations, the Dynamic Equivalence Problem, Basic Data Structure, Smart Union Algorithms, Path Compression, Worst Case for Union-by-Rank and Path Compression.

### UNIT-III

**Graph Algorithms:** Definition, Topological Sort, Shortest-Path Algorithms, Network Flow Problems, Minimum Spanning Tree, Applications of Depth-First Search, Introduction to NP-Completeness.

**Algorithm Design Techniques:** Greedy Algorithms, Divide and Conquer, Dynamic Programming, Randomized Algorithms, Backtracking Algorithms.

### UNIT-IV

**Amortized Analysis:** An Unrelated Puzzle, Binomial Queues, Skew Heaps, Fibonacci Heaps.

**Advanced Data Structures and Implementation:** Leftist Trees, Top-Down splay Trees, Deterministic Skip Lists, AA-Trees, Treaps, k-d Trees, Pairing Heaps.

### TEXT BOOKS

1. Data structures, Algorithms and Applications in C++,S.Sahni, McGraw-Hill international Edition.
2. Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education , Second edition

### REFERENCE BOOK:

1. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and D.Mount, Wiley student edition, John Wiley and Sons.

## BTCSE305: PROBABILITY, STATISTICS AND QUEUING THEORY

Theory : 4 Hrs/week

Credits : 4

Int. Marks : 25

Ext. Marks : 75

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### UNIT I

**Probability:** Sample Space and Events, Probability, The Axioms of Probability, Same Elementary Theorems, Conditional Probability, Bayes Theorem

### UNIT II

#### **Random Variables and Distribution:**

Random Variables, Discrete And Continuous, Distribution, Distribution Function, Binomial Distribution, The Poisson Distribution. The Normal Distribution, Related Properties.

### UNIT III

#### **Sampling Distribution (Basics For Understanding Purpose)**

Test of Hypothesis- Means And Proportions, Hypothesis Concerning One And Two Means, Type-1 And Type-11 Errors, One Tail, Two Tail Tests.

**Test of Significance:** Student's T - Test, F -Test,  $X^2$  - Test

### UNIT IV

#### **Curve Fitting and Correlation And Regression**

The Method of Least Squares, Inferences Based on The Least Squares Estimations, Curvilinear Regression, Multiple Regression- Correlation For Univariate And Bivariate Distributions

#### **Queuing Theory**

Structure and Operating Characteristics of Queuing System, Transient and Steady States, Terminology of Queuing System, Deterministic Queuing Models - M/M/1 of Infinite and Finite Queues

#### **TEXT BOOKS:**

1. A Text Book Of Probability And Statistics- Dr.Shahnaz Bathul- Vgs.Book Links

#### **REFERENCES:**

1. Fundamentals Of Mathematical Statistics \_S.E. Gupta & V.K. Kapoor-Sultan Chand & Sons
2. Probability & Statistics For Engineers And Scientists, Walpole ,Myers, Pearson Education
3. Operations Research, SD Sharma

## BTCSE306: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

<b>Theory</b>	<b>: 4 Hrs/week</b>	<b>Credits</b>	<b>: 4</b>
<b>Int Marks</b>	<b>: 25</b>	<b>Ext Marks</b>	<b>: 75</b>

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### UNIT -I

**Introduction To Managerial Economics:** Definition , Nature and scope Managerial economics – Demand analysis: Demand determinants, Law of Demand and its exceptions. Elasticity of Demand : Definition , types, Measurement and significance of elasticity of Demand .Demand forecasting ,factors governing demand forecasting, methods of demand forecasting(survey methods, statistical methods, expert opinion method , test marketing , controlled experiments, judgmental approach to demand forecasting)

### UNIT -II

**Theory Of Production And Cost Analysis:** Production function –Isoquants and Isocosts, MRTS , Least Cost combination of inputs, Cobb-Douglas Production function, Laws of returns, Internal and External economies of scale. Cost Analysis: Cost concepts, opportunity cost, Fixed Vs Variable costs, Explicit costs Vs Implicit cost, Out of pocket costs Vs Imputed costs. Break-even Analysis(BEA) – Determination of break even point(simple problems)- Managerial significance and limitations of BEA.

### UNIT-III

**Market Structures and Pricing Strategies:** Market structures: Types of competition ,Features of perfect competition. Monopoly and monopolistic competition . Price- Output determination in case of perfect competition and monopoly. Objectives and Policies of pricing – Methods of pricing .

Business and new economic Environment : Characteristics of business, features and evaluation of Sole Proprietorship, Partnership , Joint stock company , Public enterprises and their types, changing business environment in post – Liberalization scenario.

### UNIT-IV

**Capital and Capital Budgeting:** Capital and its significance , Types of Capital, estimation of fixed and Working Capital requirements, Methods and sources of Raising finance. Nature and scope of Capital Budgeting , features of capital budgeting proposals , Methods of capital budgeting. Financial accounting: Double entry book keeping , Journal , Ledger , Trial balance- Final accounts. Financial analysis through ratios: Computation , Analysis and interpretation of liquidity ratios, Activity ratios, Capital Structure ratios and Profitability ratios.

### TEXT BOOKS

1. Aryasri; Managerial Economics and Financial Analysis, TMH, 2007.
2. Varshney & Maheswari: Managerial Economics , sultan chand, 2007.

### REFERENCES

1. Ambrish Gupta , Financial accounting foe management, pearson education, New delhi, 2007.
2. Shim & siegel :financial accounting(Schaum's Outlines), THM, 2007.
3. Chary :Production and operations Management, THM, 2007.
4. S.N.Maheswari & S.K.Maheshwari, financial accounting, Vikas , 2007.
5. Dwivedi : Managerial economics, 6<sup>th</sup> Ed., Vikas , 2007.

## **BTCSE307: OPERATING SYSTEMS LAB**

**Lab : 3 Hrs/week**

**Credits : 2**

**Int Marks : 50**

**Ext Marks : 50**

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### **List of Programs:**

**All algorithms must be implemented in UNIX/LINUX environment**

1. Basic UNIX commands
2. Implement CPU scheduling algorithms
3. Implement different file allocation strategies
4. Implement Dead Lock Avoidance and Detection algorithms
5. Implement Page Replacement Algorithms

### **REFERENCES :**

1. Operating System Concepts. Silberschatz, Galvin and Gagne. Wiley
2. Understanding the Linux Kernel, Daniel P Bovet and Marco Cesati, 3<sup>rd</sup> Edition, Reilly, 2005.
3. Unix programming, Stevens, Pearson Education.
4. Shell programming, YashwanthKanetkar.



## **BTCSE308: OOP USING C++ LAB**

**Lab : 3 Hrs/week**

**Credits : 2**

**Int Marks : 50**

**Ext Marks : 50**

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### **List of Programs:**

1. Write a Program in C++ that implements stack operations using classes and objects.
2. Write a Program in C++ for performing complex number addition using friend functions.
3. Write a Program in C++ for complex number addition using operator overloading.
4. Write a Program in C++ to perform string operations by overloading operators.
5. Write a Program in C++ on hierarchical inheritance showing public, private and protected inheritances.
6. Write a Program in C++ for computation of student's result using hybrid inheritance.
7. Write a Program in C++ implementing bubble-sort using templates.
8. Write a Program in C++ on virtual functions.
9. Write a Program in C++ for copying one file to another file using streams.
10. Write a Program in C++ for writing and reading a class object to a file.
11. Write a Program in C++ to implement one catch block and all Exceptions
12. Write a Program in C++ to implement Multiple Catch blocks.
13. Write a Program in C++ to implement pointers to a derived class and virtual base classes.
14. Write a Program in C++ to implement conversion of objects between different classes using conversion functions.
15. Write a Program in C++ to implement function overloading- with various data types, with different number of arguments.

### **REFERENCES:**

1. Object Oriented Programming with C++, 6e by E Balagurusamy, TMH.
2. Mastering C++ KR Venu Gopal, SR Prasad
3. The Complete Reference C++ Herbert Schildt
4. C++ and JAVA Deitel and Deitel