Course Structure and Syllabus
II BTech IT I Semester
(From the admitted batch of 2017 – 2018 under CBCS Scheme)

Sub Code	Subject	Hrs/Week		Max Marks		Total Marks	Credits
		Theory	Lab	Internal	External		
BTINF301	DIGITAL LOGIC DESIGN	4	--	25	75	100	4
BTINF302	OPERATING SYSTEMS	4	--	25	75	100	4
BTINF303	OBJECT ORIENTED PROGRAMMING USING C++	4	--	25	75	100	4
BTINF304	FORMAL LANGUAGES AND AUTOMATA THEORY	4	--	25	75	100	4
BTINF305	PROBABILITY, STATISTICS AND QUEUING THEORY	4	--	25	75	100	4
BTINF306	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	4	--	25	75	100	4
BTINF307	OPERATING SYSTEMS LAB	-	3	50	50	100	2
BTINF308	OBJECT ORIENTED PROGRAMMING USING C++ LAB	--	3	50	50	100	2
TOTAL		**24**	**6**	**250**	**550**	**800**	**28**

BTINF301: DIGITAL LOGIC DESIGN

Theory	: 4 Hrs/week	**Credits**	: 4
Int Marks	: 25	**Ext Marks**	: 75

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.

BTINF302: OPERATING SYSTEMS

Theory : 4 Hrs/week   **Credits** : 4
Int Marks : 25   **Ext Marks** : 75

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. SibsankarHalder and Alex A Aravind, "Operating Systems", Pearson Education
    2. Harvey M Dietel, " An Introduction to Operating System", Pearson Education
    3. D M Dhamdhere, "Operating Systems : A Concept basedApproach", McGraw Hill.
    4. Charles Crowley, "Operating Systems: A Design-Oriented Approach", Tata McGraw Hill Education".
    5. Stuart E. Madnick& John J. Donovan.OperatingSystems.McGraw Hill.

BTINF303: OBJECT ORIENTED PROGRAMMING USING C++

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

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 Instructor, 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

BTINF304: FORMAL LANGUAGES AND AUTOMATA THEORY

Theory : 4 Hrs/week   **Credits** : 4
Int Marks : 25   **Ext Marks** : 75

UNIT-I
Finite Automata: Basic Concepts of Finite State Systems, Chomsky Hierarchy of Languages,Deterministicand Non-Deterministic Finite Automata, Finite Automata with ϵ-moves, Minimization of Finite Automata, Mealy and Moore Machines, Two-Way Finite Automata.

UNIT-II
Regular Expressions, Regular sets &Regular Grammars: Basic Definitions of Formal Languages and Grammars, Regular Expressions, Regular Sets and Regular Grammars, Closure Properties of Regular Sets, Pumping Lemma for Regular Sets, Decision Algorithm for Regular Sets.

UNIT-III
Context Free Languages&Push down Automata: Context Free Grammars and Languages, Derivation Trees, simplification of Context Free Grammars, Normal Forms, Pumping Lemma for CFL, Closure properties of CFL's. The Definition of PDA, Push-Down Automata and Context free Languages, Parsing and Push-Down Automata.

UNIT-IV
Turing Machines, Universal Turing Machines and Undecidability: The Definition of Turing Machine, Design and Techniques for Construction of Turing Machines.Universal Turing Machines. The Halting Problem, Decidable & Undecidable Problems - Post Correspondence Problem.

TEXT BOOKS:
1. Introduction to Automata Theory, Languages and Computations – J.E. Hopcroft, & J.D. Ullman, Pearson Education Asia.
2. Elements of The Theory Of Computation, Harry R Lewis, Cristos h. Papadimitriou, Pearson Education / Prentice-Hall of India Private Limited.

REFERENCE BOOKS:
1. Introduction to languages and theory of computation – John C. Martin (MGH)
2. Theory of Computation, KLP Mishra and N. Chandra Sekhar, IV th Edition, PHI
3. Introduction to Theory of Computation – Michael Sipser (Thomson Nrools/Cole)

BTINF305: PROBABILITY, STATISTICS AND QUEUING THEORY

Theory : 4 Hrs/week **Credits** : 4
Int. Marks : 25 **Ext. Marks** : 75

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.ShahnazBathul- 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

BTINF306: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Theory : 4 Hrs/week	**Credits**	: 4
Int Marks : 25	**Ext Marks**	: 75

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. AmbrishGupta , 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, 6th Ed., Vikas , 2007.

BTINF307: OPERATING SYSTEMS LAB

Lab   **: 3 Hrs/week**   **Credits**   **: 2**

<u>**Int Marks**   **: 50**</u>   <u>**Ext Marks**   **: 50**</u>

Listof Programs:

All algorithms must be implemeted 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, 3rd Edition, Reilly, 2005.
3. Unix programming, Stevens, Pearson Education.
4. Shell programming, YashwanthKanetkar.

BTINF308:Object oriented Programming using C++ LAB

Lab   **: 3 Hrs/week**   **Credits**   **: 2**
Int_Marks   **: 50**   **Ext_Marks**   **: 50**

Listof 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