

Course Structure and Syllabus

III 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		
BTINF501	DATA COMMUNICATIONS	4	--	25	75	100	4
BTINF502	PRINCIPLES OF PROGRAMMING LANGUAGES	4	--	25	75	100	4
BTINF503	COMPILER DESIGN	4	--	25	75	100	4
BTINF504	OBJECT ORIENTED ANALYSIS AND DESIGN WITH UML	4	--	25	75	100	4
BTINF505	JAVA PROGRAMMING	4	--	25	75	100	4
BTINF506	MICRO PROCESSORS & MICRO CONTROLLERS	4	--	25	75	100	4
BTINF507	JAVA PROGRAMMING LAB		3	50	50	100	2
BTINF508	OOAD LAB	--	3	50	50	100	2
BTINF509	SOFT SKILLS LAB*	-	3	50	-	50	2
TOTAL		24	9	300	550	850	28

*Soft skills lab credits will not be taken for SGPA/CGPA calculation

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BTINF501: DATA COMMUNICATIONS

Theory: 4 Hrs/week

Credits: 4

Int Marks : 25

Ext Marks : 75

UNIT-I

Introduction: Data communications, Networks, The Internet, Protocol & Standards
Network Models: Layered tasks, Internet model, OSI model, TCP/IP Protocol Suite, Addressing

UNIT-II

Physical layer: Signals: Analog and digital, Digital signals, Transmission impairment, Data Rate Limits, Performance; Bandwidth, Throughput.
Digital to Digital Conversion, Analog to Digital Conversion, Transmission Modes
Digital to Analog conversion, Analog to Analog conversion
Multiplexing and Spreading: Frequency Division Multiplexing, Wavelength Division Multiplexing, Synchronous Time-Division Multiplexing, Statistical Time-Division Multiplexing, Spread Spectrum

UNIT -III

Transmission Media – Guided Media, Unguided Media.

Switching: Circuit switched networks, datagram networks, Virtual-Circuit Networks.
Using Telephone Networks For Data Transmission: Telephone Network, Dial-Up Modems, Digital Subscriber Line

UNIT-III

Data Link Layer: Error detection and Correction: Type of errors, Block coding, linear coding, cyclic coding, checksum
Data Link Control & Protocol: Framing, Flow & error control, Protocols: Simple Protocol, Stop-And-Wait, Stop and Wait ARQ, Go-Back-N ARQ, Select Repeat ARQ, HDLC
Local Area Network: IEEE Standards, Standard Ethernet, fast and gigabit Ethernets
Connecting LANs, Backbone Networks and Virtual LANs: Connecting devices, Backbone networks, Virtual LANs

Text Book:

Data Communications and Networking, Behrouz A. Forouzan, 3rd Edition, Tata Mcgraw-Hill Publishing Co

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BTINF502: PRINCIPLES OF PROGRAMMING LANGUAGES

Theory : 4 Hrs/week
Int Marks : 25

Credits : 4
Ext Marks : 75

UNIT - I

Introduction: Programming Domains, Language Evaluation Criteria, Language Categories, Language Implementation Methods, Evolution Of The Major Programming Languages

Syntax and Semantics: The General Problem of Describing Syntax, Formal Methods of Describing Syntax, Attribute Grammars , Describing The Meaning of Programs: Dynamic Semantics

Lexical and Syntax Analysis: Lexical Analysis, The Parsing Problem, Recursive - Descent Parsing, Bottom- Up Parsing

UNIT-II

Names, Bindings, Type Checking and Scopes: Names, Variables, The Concept of Binding, Type Checking, Strong Typing, Type Compatibility, Scope and Life Time, Referencing Environments

Data Types: Primitive Data Types, Character String Types, Array Types, Pointer And Reference Types **Expressions and Assignment Statements:** Arithmetic Expressions, Overloaded Operators, Type Conversions, Relational And Boolean Expressions, Short-Circuit Evaluation, Assignment Statements, **Statement - Level Control Structures:**

Selection Statements, Iterative Statements, Unconditional Branching, Guarded Commands

Subprograms: Fundamentals, Parameter-Passing Methods, Coroutine, Implementing Simple Subprograms, Blocks

UNIT-III

Support for Object- Oriented Programming: Data Abstraction, Encapsulation, Design Issues for Object - Oriented Programming, Support for Object - Oriented Programming in C++, Support for Object- Oriented Programming In Java, Support for Object - Oriented Programming In C#, The Object Model of Java Script, Java Threads, C# Threads, Exception Handling In C++, Exception Handling In Java, Introduction To Event Handling, Event Handling With Java

UNIT-IV

Functional Programming Languages: Mathematical Functions, Fundamentals Of Functional Programming Languages, The First Functional Programming Languages: LISP, An Introduction To Scheme, COMMON LISP, ML, Haskell, Application of Functional Languages, A Comparison Of Functional and Imperative Languages

Logic Programming Languages: A Brief Introduction to Predicate Calculus, Predicate Calculus And Proving Theorems, An Overview of Logic Programming, The Origins of Prolog, The Basic Elements of Prolog, The Deficiencies of Prolog, Applications of Logic Programming.

TEXTBOOK:

1. Robert W. Sebesta, "Concepts of Programming Languages", Tenth Edition, Pearson .

REFERENCE BOOKS:

1. Ravi Sethi, " Programming Languages Concepts and Constructs", Second Edition, Pearson
2. Allen B Tucker, Robert E Noonan, Programming Languages, Principles & Paradigms, 2ed, TMH

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BTINF503: COMPILER DESIGN

Theory: 4 Periods/week
Int: 25 Marks

Credits: 4
Ext: 75 Marks

UNIT I

Introduction: Introduction to Compilers, Compilers & Translators, Why do we need Translators, The structure of a Compiler, Lexical Analysis, Syntax Analysis, Intermediate Code Generation, Optimization, Code Generation, Error Handling, Compiler Writing Tools, Bootstrapping.

Lexical Analysis: Introduction to Lexical Analysis, The role of Lexical Analyzers, Approaches to the design Lexical Analyzers, Language for specifying lexical analyzers, Implementation of lexical analyzers, Lexical Analyzer Generator LEX.

UNIT II

Syntax Analysis: Syntactic Specification of Programming Languages, Context Free Grammars & Languages, Introduction to Parsers. Top-down parsing techniques: Brute force parsing, Recursive Descent Parsing, Predictive Parsing, Bottom – up Parsing: Shift reduce parsing, Operator precedence parsing, Simple LR Parser, Canonical LR and LALR Parsing Techniques.

Semantic Analysis and Intermediate Code Generation: Semantic Actions, Syntax Directed Translations, Translation on the parse Tree, Implementation of Syntax Directed Translator, Intermediate Codes, Syntax Directed translation to Postfix code.

UNIT III

Code Optimization: Principal sources of Code Optimization, Loop Optimization, DAG Representation of Basic Blocks, Applications of DAG's, Global Data Flow Analysis, Data Flow Equations & Computations. Machine Dependent Optimizations, Overview of Informal Compiler Algorithm Notation(ICAN), If Simplification, Loop Simplification, Loop Inversion, Branch Optimization and Prediction.

Code Generation: Object programs, problems in Code Generation, A Simple Code Generator, Register allocation & Assignments, Code Generation from DAG's. Peephole Optimization.

UNIT IV

Symbol Table Management: Contents of a Symbol Table, Data Structures for Symbol Tables; Run time Environments, Implementation of a simple Stack allocation, Heap Management, Block Structured Languages;

Error Handling: Errors, Lexical Phase Errors, Syntactic Phase Errors, Semantic Errors, Error Handling Routines.

TEXT BOOK:

1. Principles of Compiler Design by Aho,D. Ullman, Lam and Ravi Sethi, Pearson Education Second Edition
2. Advanced Compiler Design and Implementation, Steven Muchnic, Elsevier Publications

REFERENCE BOOKS:

1. Compiler Construction by Kenneth. C. Loudon, Vikas Pub.House.
2. Compiler Design, A.A. Pentambekar, Technical Publications
3. Modern Compiler Design, Grune.D, VanReeuwijk K, Bal H.E, Jacobs C J H, Langendoen K Springer.

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BTINF504: OBJECT ORIENTED ANALYSIS AND DESIGN WITH UML

Theory: 4 Periods/week
Int: 25 Marks

Credits: 4
Ext : 75 Marks

UNIT- I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modelling, Conceptual model of the UML, Architecture, and Software Development Life Cycle.

Structural Modeling: Classes, Relationships, common Mechanisms, and Diagrams (Structural and Behavioural), Common Modeling Techniques.

UNIT-II

Advanced Structural Modelling: Advanced classes, advanced relationships, class diagrams, object diagrams

Basic Behavioural Modelling: Interactions, Interaction diagrams. Use cases, Use case Diagrams, and Activity Diagrams.

UNIT- III

Advanced Behavioural Modelling-1: Events and signals, State machines, Processes and Threads, Time and space, State Diagrams

Architectural Modelling: Components, Deployment, Component diagrams, Deployment diagrams.

UNIT-IV

Design Patterns: What Is a Design Pattern?, Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

TEXT BOOKS:

1. "Object- Oriented Analysis And Design with Applications", Grady BOOCH, Robert A. Maksimchuk, Michael W. ENGLE, Bobbi J. Young, Jim Conallen, Kellia Houston, 3rd edition, 2013, PEARSON.
2. "The Unified Modelling Language User Guide", Grady Booch, James Rumbaugh, Ivar Jacobson, 12th Impression, 2012, PEARSON.
3. Design Patterns By Erich Gamma, Richard Helmm Ralph Johnson, John Vlissides, Pearson Education.

REFERENCE BOOKS:

1. "Object-oriented analysis and design using UML", Mahesh P. Matha, PHI
 2. "Head first object-oriented analysis and design", Brett D. McLaughlin, Gary Pollice, Dave West, O'Reilly
 3. "Object-oriented analysis and design with the Unified process", John W. Satzinger, Robert B. Jackson, Stephen D. Burd, Cengage Learning
 4. "The Unified modeling language Reference manual". James Rumbaugh, Ivar Jacobson, Grady Booch, Addison-Wesley
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BTINF 505: JAVA PROGRAMMING

Theory : 4 Hrs/week

Credits : 4

Int Marks : 25

Ext Marks : 75

UNIT-I

Fundamentals of object oriented programming: Introduction, Object oriented paradigm, Basic concepts of oop: Objects and classes, Data Abstraction and encapsulation, Inheritance, Polymorphism, Dynamic binding, Message communication.

Java evolution: Java History, Java Features, How java differs from C and C++, Java and Internet, Java and world wide web, web browsers, Hardware and Software requirements, java support systems, java Environment,

Overview of java language: Introduction, Simple java program, More of java, An Application with two classes, java Program structure, java tokens, java statements, Implementing a java program, java virtual machines, command line arguments, programming style.

Constants variables and data types: Introduction, Constants, Variables, Data Types, Declaration of variables, Giving values to variables, Scope of variables, Symbolic constants, Type casting.

UNIT-II

Operators and expressions : Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation Of Expressions, Precedence of Arithmetic Operators, Type conversions in Expressions, Operator Precedence And Associativity, Mathematical Functions.

Decision making and branching: Introduction, Decision Making With IF Statement, Simple IF Statement, The IF...ELSE Statement, Nesting Of IF...ELSE Statements, The ELSE...IF Ladder, The Switch Statement, The?: Statement.

Decision making and looping: Introduction, The While Statement, The DO Statement, The For Statement, Jumps In Loops, Labelled Loops.

Classes objects and methods: Introduction, Defining a Class, Adding Variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting Of Methods, Inheritance: Extending A Class, Overriding Methods, Final Variables And Methods, Final Classes, Finalizer methods, Abstract Methods and Classes, Visibility Control.

UNIT-III

Arrays, Strings and Vectors : Arrays, One Dimensional Array, Creating an Array, Two Dimensional Arrays, Strings, Vectors, Wrapper classes.

Interfaces: Multiple Inheritance: Introduction, Defining Interfaces, Extending Interfaces, Implementing interfaces, Accessing Interface Variables.

Packages: putting classes together: Introduction, Java API packages, Using System Packages, Naming Conventions, Creating Packages, Accessing a Package, Using a Package, Adding a class to a Package, Hiding Classes.

Multithreaded Programming: Introduction, creating Threads, Extending the Thread classes, Stopping and Blocking a thread, Life cycle of a thread, Using Thread methods, Thread Exceptions, Thread priority, Synchronization, Implementing the Runnable Interface

UNIT-IV

Managing errors and Exceptions: Introduction, Types Of Errors, Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, Using Finally Statement, Throwing our Exceptions, Using exceptions For Debugging.

Applet Programming: Introduction, How Applets Differ from Applications, Preparing To write Applets, Building Applet Code, Applet Life Cycle, Creating an Executable Life Cycle, Designing A Web Page, Applet Tag, Adding Applet to HTML Files, Running The Applet, More About The Applet Tag, Passing Parameters to Applets, Aligning The display, More About The HTML Tags, Displaying Numerical values, Getting Input From The User.

Graphics Programming: Introduction, the Graphics Class, Lines And Rectangles, Circles and Ellipses, Drawing Arcs, Drawing Polygons, Line Graphs, Using Control Loops in Applets, Drawing Bar Charts.

Managing input/output files in java: Introduction, Concept of Streams, Stream classes, Byte Stream Classes, Character Stream Classes, Using Streams , Other Useful I/O Classes, Using The File Class, Input/output Exceptions , Creation of Files, Reading/Writing Characters, Reading/Writing Bytes, Handling Primitive Data Types , Concatenating And buffering Files , Random Access Files , Interactive Input/output , Other Stream Classes

TEXT BOOKS:

Programming with java –E Balaguruswamy, Tata Mc Graw hill publications

REFERENCE BOOKS:

Java Complete Reference, Tata Mc Graw Hill Publications.

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BTINF506: MICRO PROCESSORS & MICRO CONTROLLERS

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

UNIT-I

8086/8088 MICROPROCESSORS

Register organization of 8086, Architecture, signal description of 8086, physical memory organization, general bus operation, I/O addressing capability, special purpose activities, Minimum mode, maximum mode of 8086 system and timings, the processor 8088, machine language instruction formats, addressing mode of 8086, instruction set of 8086, assembler directives and operators.

UNIT-II

PROGRAMMING WITH 8086 MICROPROCESSOR

Machine level programs, programming with an assembler, Assembly language programs, introduction to stack, stack structure of 8086/8088, interrupts and interrupt service routines, interrupt cycle of 8086, non-maskable interrupt and maskable interrupts, interrupt programming.

UNIT-III

BASIC AND SPECIAL PURPOSE PROGRAMMABLE PERIPHERALS AND THEIR INTERFACING WITH 8086/88

Semiconductor memory interfacing, dynamic RAM interfacing, interfacing i/o ports, PIO 8255 modes of operation of 8255, interfacing to D/A and A/D converters, stepper motor interfacing, control of high power devices using 8255. Programmable interrupt controller 8259A, the keyboard / display controller 8279, programmable communication interface 8251 USART, DMA Controller 8257.

UNIT-IV

8051 MICROCONTROLLER

Introduction to microcontrollers, 8051 Microcontrollers, 8051 pin description, connections, I/O ports and memory organization, MCS51 addressing modes and instructions, assembly language programming tools.

Overview and features, PIC16Cx/7X instructions, interrupts in PIC 16C61/71, PIC 16F8XX Flash controllers, I/O ports and timers.

Introduction To 16/32 Bit processors, ARM architecture and organization, ARM / Thumb programming model, ARM / Thumb instruction set.

TEXT BOOKS:

1. A.K.Ray, K.M.Bhurchandi ,”Advanced Microprocessors and Peripherals”, Tata McGraw Hill Publications, 2000.
2. N.Sentil Kumar, M.Saravanan, S.Jeevananthan, “Microprocessors and Microcontrollers”, Oxford University Press, 2010.

REFERENCES:

1. Ajay V Deshmukh, “Microcontrollers”, TATA McGraw Hill publications, 2012.
2. Krishna Kant, “Microprocessors and Microcontrollers”, PHI Publications, 2010.

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BTINF 507: JAVA PROGRAMMING LAB

Lab: 3 Hrs /week
Int Marks :50

Credits : 2
Ext Marks : 50

1. A Simple Java Program demonstrating methods of Exception class
2. How to use Array list in Java with Examples ?
3. How to create and run a Thread using Runnable Interface ?
4. How to create simple Hello world Servlet application in Java ?
5. How to connect MySQL Database using JDBC API in Java ?
6. A Simple Java Program to read and download a web page in HTML file ?
7. How to connect to a remote server through a Java program ?
8. How to run a simple Applet in Java ?
9. Program to demonstrate how to implement Object Oriented Programming Encapsulation feature in Java Programming language
10. How to demonstrate Polymorphism through a simple Java Program?

TEXT BOOKS:

Java Complete reference, 10th Edition by Herbert Schildt, publisher :Oracle press

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BT INF 508: OOAD LAB

Lab: 3 Hrs/week

Credits : 2

Int Marks :50

Ext Marks: 50

OBJECTIVES:

- Construct UML diagrams for static view and dynamic view of the system.
- Generate creational patterns by applicable patterns for given context.
- Create refined model for given Scenario using structural patterns.
- Construct behavioural patterns for given applications.

Document the Software Project Management and Software Engineering activities for any SIX of the following projects. Any other project of interest also can be chosen.

1. Student Management System
2. Library Management System
3. Employee Management System
4. Railway Reservation System
5. Automatic Teller Machine
6. Hostel Management System
7. Hospital Management System
8. Online Shopping System
9. Blood Bank Management System
10. Restaurant Management System
11. Journal Publication System

Software Project Management and Software Engineering activities specified below can be customized according to the features of the project.

- Problem Statement
- Feasibility Study
- Software Requirements Specification Document
- Estimation of Project Metrics
- Entity Relationship Diagram
- Use Case Diagrams
- Class Diagram
- Sequence Diagrams
- Activity Diagrams
- State Chart Diagrams
- Test coverage

REFERENCE BOOKS:

1. The Unified Modeling Language User Guide. Grady Booch, James Rumbaugh and Ivar Jacobson. Addison-Wesley.
2. Object Oriented Software Engineering: Practical Software Development using UML and Java. Timothy C Lethbridge & Robert, Langaneire, Mc Graw Hill.

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BTINF 509: SOFT SKILLS LAB

Theory : 3 Hrs/week

Credits :2

Int Marks : 50

Ext Marks : 00

PART-I: TECHNICAL ABILITY

According to CSE Syllabus

PART-II: SOFT SKILLS

- Self Introduction
- SWOT and SWOC Analysis
- Presentation Skills
- JAM Session
- Group Discussion
- Debate

PART-III: ACADEMIC/ SCIENTIFIC WRITING

- ABC of Technical Communication
- Style and Objectivity
- Report Writing
- Referencing

PART-IV: CV/ RESUME & COVER LETTER PREPARATION

1. Types of Resumes
2. Writing Resume
3. Job application letter
4. Joining Report writing

PART-V: INTERVIEW SKILLS

5. Pre-interview preparation
6. Types of interview questions
7. Body Language and Dress Code
8. Technical Interview

PART-VI: QUANTITATIVE APTITUDE

1. Problem Solving (Mathematics)
2. Language Skills

REFERENCES BOOKS:

1. Effective technical communication, M Arshraf Rizvi
2. Technical Communication, Raman & Sharma
3. Computer organization:
4. Compiler design:
5. Operating systems: Tenan Baum
6. Software engineering: Pressman
7. Theory of computation:
8. DBMS: Elma Sri
9. C&DS : Kernigan and Ritchie
10. OOPs: Dietel and Dietel
11. Computer networks: Tenan Baum,

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