

BTCSE501: DATA COMMUNICATIONS

Theory: 4 Hrs
Int Marks : 25

Credits : 4
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 Ethernet

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

BTCSE502: PRINCIPLES OF PROGRAMMING LANGUAGES

Theory	: 4 Hrs/week	Credits	: 4
Int Marks	: 25	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, AComparision Of Functional and Imperative Languages

Logic Programming Languages:A Brief Introduction to Predicate Calculus, Predicate Calculus And Proving Theorms, An Overview of Logic Programming, The Origins of Prolog, The Basic Elements of Prolog, The DeficienciesofProlog, 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,ProgrammingLangugaes, Principles & Paradigms, 2ed, TMH

BTCSE503: 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. Louden, Vikas Pub.House.
2. Compiler Design, A.A. Pentabekar, TechnicalPublications
3. Modern Compiler Design, Grune.D, VanReeuwijk K, Bal H.E, Jacobs C J H, Langendoen K Springer.

BTCSE504: ARTIFICIAL INTELLIGENCE& EXPERT SYSTEMS

Theory: 4 Periods/week
Int: 25 Marks

Credits: 4
Ext: 75 Marks

UNIT- I

Problems and Search:What is Artificial Intelligence, The AI Problems, and Underlying Assumption, what is an AI Technique.

Problems,Problems Spaces, and Search: Defining the problem as a state space search, production systems, problems characteristics, issues in the design of search programs.

UNIT- II

Heuristic Search Techniques: Generate-and-test, Hill Climbing, Best-First Search, Problem Reduction, Constraint Satisfaction, Means-Ends Analysis,

Knowledge Representation Issues: Representations and Mapping, Approaches to Knowledge Representation, The frame problem.

UNIT- III

Representing Knowledge using Rules: Procedural Vs Declarative knowledge, Logic Programming, Forward Vs Backward Reasoning, Matching, Control Knowledge

Symbolic Reasoning under Uncertainty: Introduction to Nonmonotonic Reasoning, Logics for Non-monotonic Reasoning, Implementation issues, Augmenting a Problem solver, implementation: DFS, BFS.

Statistical Reasoning: Probability and Bayes Theorem, Certainty Factors and Rule-Based Systems. Bayesian Networks, Dempster-Shafer Theory, Fuzzy Logic.

UNIT- IV

Expert System, Concepts and Characteristics, Applications and Domains of Expert System, Elements of an Expert System, Stages in the Development of an Expert System, Semantic Nets, Frames.

Speech Recognition, Forms of Learning, Inductive learning, Learning Decision Trees, Single Layer Feed Forward, Multi-Layer Feed Forward Neural Networks.

TEXT BOOKS

- Artificial Intelligence, Second Edition, Elaine Rich, Kevin Knight, Tata McGraw-Hill Edition. (1, 2, 3 Units)
- Artificial Intelligence: A Modern Approach, Stuart Russell, Peter Norvig, Pearson Education 2nd Edition. (4th Unit)

Reference Books:

1. Expert Systems: Principles and Programming, Joseph C Giarratano, Gary D Riley Thomson Publication, 4th Edition.

BTCSE 505: JAVA PROGRAMMING

Theory : 4 Hrs

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 worldwide 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 book:

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

Reference: java Complete Reference, Tata Mc Graw Hill Publications.

BTCSE506: MICRO PROCESSORS AND MICRO CONTROLLERS

Theory	: 4 Hrs	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.

BTCSE 507: JAVA PROGRAMMING LAB

Lab: 3 Hrs

Credits : 2

Int Marks :50

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

BTCSE 508:MICROPROCESSORS AND MICROCONTROLLERS LAB

Lab: 3 Hrs

Credits: 2

Int Marks :50

Ext Marks: 50

Objective:The students are required to develop the necessary Algorithm, Flowchart and Assembly Language Program Source Code for executing the following functions using MASM/TASM software and to verify the results with necessary Hardware Kits.

PART-I: MICROPROCESSOR 8086

1. Introduction to MASM/TASM.
2. Arithmetic operation- Multi byte Addition and Subtraction, Multiplication and Division- Signed and unsigned Arithmetic operation, ASCII- Arithmetic operation.
3. Logic operations-Shift and rotate- Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) - Display characters, Strings.

PART-II: INTERFACING WITH MICROPROCESSOR

1. 8259 – Interrupt Controller-Generate an interrupt using 8259 timer.
2. 8279 – Keyboard Display- Write a program to display a string of characters.
3. 8255 – PPI-Write ALP to generate sinusoidal wave using PPI.
4. 8251 – USART-Write a program in ALP to establish Communication between two processors.

PART-III: MICROCONTROLLER 8051

1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

PART-IV: INTERFACING WITH MICROCONTROLLER

Write C programs to interface 8051 chip to Interfacing modules to Develop single chip solutions.

1. Simple Calculator using 6 digit seven segment display and Hex Keyboard interface to 8051.
2. Alphanumeric LCD panel and Hex keypad input interface to 8051.
3. External ADC and Temperature control interface to 8051.
4. Generate different waveforms Sine, Square, Triangular, and Ramp etc. Using DAC interface to 8051; change the frequency and Amplitude.