# CS401

## DISTRIBUTED COMPUTING

1. **Distributed Systems** - Goal - Advantages over centralized systems - Organization of multiprocessor systems - Hardware/software concepts - Review of layered protocols.

2. **Client/Server Model** - Microkernel - RMI - Distributed algorithms - Time stamping - Circulating tokens - Diffusing computations.

3. **Mutual Exclusion Algorithm** - Election algorithm - Detecting loss of tokens and regeneration - Distributed deadlock detection algorithms - Distributed termination algorithms.

4. **File Replication** - Semantics of file sharing - Remote access methods - Fault tolerant issues - Introduction to distributed operating systems.

5. **Introduction to Distributed Operating Systems** - Motivations - Management systems - Levels of distribution transparency - Architecture - Introduction to concurrency control.

### TEXT:

- GEORGE COULOURIS, JEAN DOLLIMORE, TIM KINDBERG, "Distributed System Concepts and Design", 4th Edition, Addison Wesley, 2005
- A. S. TANENBAUM, "Distributed Operating Systems", Prentice Hall, 1995
- S. CERI, G.PELAGATTI, "Distributed Databases - Principles and Systems", McGraw Hill, 1985

# CS405

## PRINCIPLES OF COMPILER DESIGN

1. **Introduction** - Structure of a compiler - Different phases of a compiler - Finite automata and lexical analysis.

2. **Syntactic specification** - Context-free grammars - Derivation and parse trees - Basic parsing techniques.

3. **LR Parsers** - SLR, Canonical LR and LALR - Syntax-directed translation schemes - Various forms of intermediate code.

4. **Translation** of array references, procedure calls, declarations and case statements - Symbol tables - Run-time storage administration - Error detection and recovery.

5. **Code Optimization** - Loop optimization - DAG representation of basic blocks - Code generation from DAG's - Compiler compilers: YACC - Attributed parser generators.

### TEXT:

- A.V.AHO, R.SETHI, J.D.ULLMAN, "Compilers, Principles, Techniques and Tools", Pearson Education, 13th Indian Reprint, 2003
- J.P. TREMBLAY, P.G. SORRENSON, "The Theory and Practice of Compiler Writing", McGraw Hill, 1985

# CS407

## ADVANCED COMPUTER ARCHITECTURE

1. **Parallel computer models** - Flynn's classification - Parallel and vector computers - System, implicit and explicit parallelism - Multi-vector and SIMD computers - PRAM and VLSI models.

2. **Program and network properties** - Data and control dependence - Hardware and software parallelism - Partitioning and scheduling - Interconnection architectures.

3. **Performance laws** - Metrics and measures - Amdahl's law for fixed workload - Bounded speed-up model - Scalability analysis and approaches.

4. **Symbolic Processors** - CISC and RISC architectures - Super scalar processors and their features - Memory hierarchy.

5. **Linear Pipeline Processors** - Basic considerations - Basics of non-linear pipeline processors - Design of pipelined architecture - Recent trends and developments.

### TEXT:

- K.HWANG, "Advanced Computer Architecture, Parallelism, Scalability, Programmability", McGraw Hill, New York, 1993
- D.A.PATTERSON, J.L.HENNESSY, "Computer Architecture: A Quantitative Approach", Harcourt Asia, Morgan Kaufmann, 1999

# CS403

## WEB TECHNOLOGY

1. **Unit 1** Internet Principles - Basic web concepts - client/server model - Retrieving data from internet - Internet protocols and applications

2. **Unit 2** HTML-Forms - HTML, tags emulation - Links and addressing - HTML and Images

3. **Unit 3** Streaming - Network principles - Sockets for Clients - Sockets for Servers - Protocol Handlers - Content Handlers - Multicast Sockets - Remote method Invocation

4. **Unit 4** Javascript, VBScript, DHTML, XML, CGI, Servlets

5. **Unit 5** Java Server Pages, Active Server Pages, Simple applications - On-line databases - Monitoring user events - Plugins - Database connectivity

### TEXT:

- Eillotte Rusty Harold "Java Network Programming", O'Reilly Publications, 1997
- Harvey M. Deital and Paul.J.Deitel, "Internet & World Wide Web How to Program", 4th Edition, 2008

# CS413

## COMPILER DESIGN LABORATORY

- Design of lexical analyzers and parsers like recursive-descent parser for a block structured language with typical constructs
- Exercises using LEX and YACC
- Quadruples/Triples generation using LEX and YACC for a subset of a block structured language e.g. PASCAL

# CS415

## WEB TECHNOLOGY - LAB

- Designing a static web page using HTML
- Designing a dynamic webpage using DHTML using different style sheets
- Working with AWT and different layouts in Java
- Programs using Java Applets
- Programs for creating simple chat application using Datagram sockets and Datagram Packets
- Java socket programming to implement HTTP request, FTP, SMTP, POP3
- Programming using Java servlets to create three-tier applications