

CS – 701 AUTOMATA & COMPILER DESIGN

UNIT – I

Introduction: Alphabets, Strings and Languages, Automata and Grammars, Deterministic finite Automata (DFA)-Formal Definition, Simplified notation: State transition graph, Transition table, Language of DFA, Nondeterministic finite Automata (NFA), Equivalence of NFA and DFA, Minimization of Finite Automata, Regular Expressions, Arden's theorem.

UNIT – II

Compiler Structure: Compilers and Translators, Various Phases of Compiler, Pass Structure of Compiler, Bootstrapping of Compiler. Lexical Analysis: The role of Lexical Analyzer, A simple approach to the design of Lexical Analyzer, Implementation of Lexical Analyzer. The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers.

UNIT – III

Bottom-Up Parsers, Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR) Syntax Analyzer Generator: YACC, Intermediate Code Generation: Different Intermediate forms: three address code, Quadruples & Triples. Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postfix translation.

UNIT – IV

Run Time Memory Management: Static and Dynamic storage allocation, stack based memory allocation schemes, Symbol Table management Error Detection and Recovery: Lexical phase errors, Syntactic phase errors, Semantic errors.

UNIT – V

Code Optimization and Code Generation: Local optimization, Loop optimization, Peephole optimization, Basic blocks and flow graphs, DAG, Data flow analyzer, Machine Model, Order of evaluation, Register allocation and code selection

REFERENCES:

- 1.Principles of compiler design -A.V. Aho . J.D.Ullman; Pearson Education.
- 2.Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.
- 3.A. C. Holub. Compiler Design in C , Prentice-Hall Inc., 1993.
- 4.Raghavan, Compiler Design, TMH Pub.

List of Experiments:

1. Develop a lexical analyzer to recognize a few patterns.
2. Write a programme to parse using Brute force technique of Topdown parsing.
3. Develop LL (1) parser (Construct parse table also).
4. Develop an operator precedence parser (Construct parse table also)
5. Develop a recursive descent parser
6. Write a program for generating for various intermediate code forms i) Three address code ii) Polish notation
7. Write a program to simulate Heap storage allocation strategy
8. Generate Lexical analyzer using LEX
9. Generate YACC specification for a few syntactic categories.
10. Given any intermediate code form implement code optimization techniques

CS - 702-CLOUD COMPUTING

UNIT-I

Introduction, Cloud computing history, Cloud architecture, Characteristics of cloud computing as per NIST, Cloud services requirements, System Models for Distributed and Cloud Computing, NIST Cloud Computing Reference Architecture, Applications, ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis, Satellite Image Processing, CRM and ERP, Social networking.

UNIT-II

Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance, Design Challenges, Inter Cloud Resource Management, Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources, Cloud services (IaaS, PaaS & SaaS).

UNIT-III

Basics of Virtualization, Types of Virtualization, Implementation Levels of Virtualization, Virtualization Structures, Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices, Virtual Clusters and Resource management, Virtualization for Data-center Automation, Virtual LAN (VLAN) and Virtual SAN (VSAN) and their benefits.

UNIT-IV

Cloud Security:- Security Overview Infrastructure security, Data security and storage, Network security – I , Network security – II, Host security, Disaster recovery and management, Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Security Architecture.

UNIT-V

Cloud Solutions: - Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management Third Party Cloud Services, Market Based Management of Clouds. Case study: - Amazon cloud services, Amazon EC2, Amazon S3, Google cloud services, Google Map reduce, GFS, Sales Force, Windows Azure- EMC cloud services, IBM cloud services, Apache Hadoop.

REFERENCES:

1. Kenneth Hess, Amy New Man – Practical Virtualization Solutions – Prentice Hall, 2010
2. Shahed Latif, Tim Mather, Subra Kumara swamy – Cloud Security and Privacy: An Enterprise perspective on risks and compliance – O'Reilly Media Inc., 2009
3. Gautam Shroff – Enterprise Cloud Computing: Technology, Architecture, Applications – Cambridge Press, 2010

LIST OF EXPERIMENTS

1. Creating and working with a new document in Google docs.
2. Preparing a presentation of ten slides on using Google docs.
3. Setting up service for running hadoop daemons on windows 7
4. Create and Deploy a Cloud Service
5. Study of Eucalyptus
6. Installation of Eucalyptus Cloud
7. Study of Cloudsim.
8. CloudSim setup and installation
9. Working and installation of Google App Engine
10. Working in Cloud9 to demonstrate different language.

CS – 703 NETWORK & WEB SECURITY

UNIT-I

Symmetric Ciphers - Overview: Services, Mechanisms and Attacks, The OSI Security Architecture, A Model of Network Security. Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, Steganography. System Security- Intruders, Malicious Software, Viruses and Related Threats, Counter Measures, Firewalls and its Design Principles.

UNIT-II

Block Cipher and the Data Encryption Standard: Simplified DES, Block Cipher Principles, The DES, The Strength of DES, Differential and Linear Cryptanalysis. Symmetric Ciphers: Triple DES, Blowfish. Confidentiality using Conventional Encryption: Placement of Encryption Function, Traffic Confidentiality, Key Distribution, Random Number Generation

UNIT-III

Public Key Encryption, Digital Signatures - Number Theory, Prime Numbers, Fermat's and Euler's Theorems. Public Key Cryptography and RSA: Principles of Public Key Cryptosystems, The RSA Algorithms, Key Management, Diffie Hellman Key Exchange.

UNIT-IV

Authentication Protocols - Message Authentication:- Authentication Requirements, Authentication Functions, Message Authentication Codes, MD5 Message Digest Algorithms, Digital Signatures and Authentication Protocols: - Digital Signatures, Authentication Protocols, Digital Signature Standards.

UNIT-V

Network Security - Authentication Applications: Kerberos, X.509 Directory, Authentication Service. Electronic Mail Security: Pretty Good Privacy. IP Security: - Overview, IP Security Architecture, Authentication Header, Encapsulation Security Payload. Web Security: Web Security Requirements, Secure Sockets Layer and Transport Layer Security, Secure Electronic Transaction.

REFERENCES:

- 1.Charlie Kaufman, Radia Perlman, Mike Speciner, Network Security: Private Communication in Public World, 2nd Edition,2011, Pearson Education.
- 2.Atul Kahate, Cryptography and Network Security, TMH. (2003)
3. William Stallings, Cryptography and Network Security,4 Edition, Pearson Education/PHI. 2006

CS-704 SOFTWARE ENGINEERING

UNIT-I

System Analysis and Design:-Overview of System Analysis & Design , Business System Concept, System Development Life Cycle, Waterfall Model , Spiral Model, Feasibility Analysis, Technical Feasibility, Cost Benefit Analysis, COCOMO model.

UNIT-II

Design related issues:-System Requirement Specification –DFD, Data Dictionary, ER diagram, Process Organization & Interactions. System Design –Problem Partitioning, Top-Down And Bottom-Up design; Decision tree, decision table and structured English; Functional vs. Object Oriented approach.

UNIT-III

Coding & Documentation:-Coding & Documentation –Structured Programming, OO Programming, Information Hiding, Reuse, System Documentation. Testing –Levels of Testing, Integration Testing, Test case Specification, Reliability Assessment, Validation & Verification Metrics, Monitoring & Control.

UNIT IV

Coding standard and guidelines, programming style, code sharing, code review, software components, rapid prototyping, specialization, construction, class extensions, intelligent software agents, reuse performance improvement, debugging.

UNIT V

Software quality Assurance –Software quality factors –Quality assurance, quality metrics - Halstead's S/W Science. Software Testing, Techniques S/W testing fundamentals –White Box testing, Black box –testing, Validation Testing, system Testing, debugging, software maintenance maintainability –maintenance tasks –Reverse engineering and Re engineering.

REFERENCES:

- 1.Roger S. Pressman –“Software Engineering”, Mc.Graw Hill.
2. Rajiv mall: Software engineering”
3. Sommerville, ”Software Engineering”, Pearson Education.

ELECTIVE-I (CS – 705(A))- E-COMMERCE & GOVERNANCE

UNIT I

Introduction to e-commerce: History of e-commerce, e-business models B2B, B2C, C2C, C2B, legal; environment of e-commerce, ethical issues, electronic data interchange, value chain and supply chain, advantages and disadvantages of e-commerce.

UNIT II

Electronic Payment Systems: Credit cards, debit cards, smart cards, e-credit accounts, e-money, Marketing on the web, marketing strategies, advertising on the web, customer service and support, introduction to m-commerce, case study: e-commerce in passenger air transport.

UNIT III

E-Government, theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

UNIT IV

E-readiness, e-government readiness, E- Framework, step & issues, application of data warehousing and data mining in e-government, Case studies: NICNET-role of nationwide networking in e-governance, e-seva.

UNIT V

E-Government systems security: Challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers.

REFERENCES:-

1. Gary P. Schneider, “E-commerce”, Cengage Learning India.
2. C.S.R. Prabhu, “E-governance: concept and case study”, PHI Learning Private Limited.
3. V. Rajaraman, “Essentials of E-Commerce Technology”, PHI Learning Private Limited.
4. David Whiteley, “E-commerce study, technology and applications”, TMH.

ELECTIVE-I (CS – 705(B))- SIMULATION & MODELING

UNIT I

Modeling and simulation: Models types, principles used in modeling, Modeling and simulation methodology, system modeling , concept of simulation, continuous and discrete time simulation, steps in computer simulation, advantages and disadvantages of simulation, simulation study, classification of simulation languages.

UNIT II

Simulation of Queuing System AND Applications: Queuing system, Characteristics Poisson arrival patterns, birth- death system, equilibrium of queuing system, analysis of M/M/1 queues. Application of queuing theory in computer system like operating systems, computer networks etc.

UNIT III

Probability concepts in simulation: Basic concept of probability , discrete and continuous probability function, continuous and discrete random variables, distribution of random variables: discrete and continuous, Compartmental models: linear, nonlinear and stochastic models Discrete and Continuous probability functions, Continuous Uniformly Distributed Random Numbers, Generation of a Random numbers, Generating Discrete distributions, Non-Uniform Continuously Distributed Random Numbers, Rejection Method.

UNIT IV

System Dynamics & Probability concepts in Simulation: Exponential growth and decay models, logistic curves, Generalization of growth models, System dynamics diagrams, Multi segment models, Representation of Time Delays.

UNIT V

Verification and validation: Design of simulation experiments, validation of experimental models, testing and analysis. Simulation languages comparison and selection, study of Simulation sw -SIMULA, DYNAMO, STELLA, POWERSIM.

Reference:

1. Gordon G., System simulation, Printice Hall.
2. Payer T., Introduction to system simulation, McGraw Hill.
3. Seila, Applied Simulation Modeling, Cengage
4. Spriet, Computer Aided Modeling and Simulation, W.I.A.

ELECTIVE-I (CS – 705(C))- AD-HOC NETWORK

UNIT I

Introduction :Introduction-Fundamentals of Wireless Communication Technology, The Electromagnetic Spectrum, GSM, GPRS, PCS, WLAN and UMTS, Components of Packet Radios, Routing in PRNETs, Ad Hoc Wireless Networks, Wireless Sensor Networks, Traffic Profiles, Types of Ad Hoc Mobile Communications, Types of Mobile Host Movements, Challenges Facing Ad Hoc Mobile Networks.

UNIT II

Ad Hoc wireless MAC protocols- Introduction, Synchronous and asynchronous MAC protocols, Problem in Ad Hoc channel access, Receiver-initiated and sender-initiated MAC protocols, Existing Ad Hoc MAC protocols, Ad Hoc Routing Protocols- Introduction, Classifications of Routing Protocols: Table-Driven Routing Protocols – Destination Sequenced Distance Vector (DSDV), Wireless Routing Protocol (WRP), Source-Initiated On-Demand Approaches - Ad Hoc On-Demand Distance Vector Routing (AODV), Dynamic Source Routing (DSR), Temporally Ordered Routing Algorithm (TORA), Signal Stability Routing (SSR) Location Aided Routing (LAR).

UNIT III

Multicast routing In Ad Hoc Networks : Introduction, Issues in Designing a Multicast Routing Protocol, Operation of Multicast Routing Protocols, An Architecture Reference Model for Multicast Routing Protocols, Classifications of Multicast Routing Protocols, Tree-Based Multicast Routing Protocols, Mesh- Based Multicast Routing Protocols, Summary of Tree-and Mesh-Based Protocols - Energy-Efficient Multicasting.

UNIT IV

Transport Layer, Security Protocols : Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management.

UNIT V

QoS and Energy Management : Introduction, Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks, Classifications of QoS Solutions, MAC Layer Solutions, Network Layer Solutions, Energy Management in Ad Hoc Wireless Networks – Introduction, Need for Energy Management in Ad Hoc Wireless Networks, Classification of Energy Management Schemes.

REFERENCES BOOKS:-

1. C. Siva Ram Murthy and B.S. Manoj “Ad Hoc Wireless Networks: Architectures and Protocols”, Pearson Education.
2. C.K. Toh, “Ad Hoc Mobile Wireless Networks: Protocols and Systems”, Pearson Education.
3. George Aggelou, “Mobile Wireless Networks”, Tata McGraw- Hill.

CS 706- INDUSTRIAL TRAINING

SCHEME OF STUDIES

Duration: 2 weeks after the VI semester in the summer break, Assessment in VII semester.

SCHEME OF EXAMINATION

For the assessment of industrial training undertaken by the students, following components are considered with their weightage.

(a) Term work

In Industry Marks allotted

1. Attendance and General Discipline
2. Daily diary Maintenance
3. Initiative and participative attitude during training
4. Assessment of training by Industrial Supervisor

(b) Practical/Oral Examination (Viva-Voce) In Institution Marks allotted

1. Training Report
2. Seminar and cross questioning (defense)

Marks of various components in industry should be awarded to the students, in consultations with the Training and Faculty of Institute and I/c of training from Industry. During training students will prepare a first draft of training report in consultation with section in-charge. After training they will prepare final draft with the help of Faculty of the institute. Then they will present a seminar on their training and they will face viva-voce on training in the institute.

1.1 OBJECTIVE OF INDUSTRIAL TRAINING

The objective of undertaking industrial training is to provide work experience so that student's engineering knowledge is enhanced and employment prospects are improved. The student should take this course as a window to the real World of Work and should try to learn as much as possible from real life experiences by involving and interacting with industry staff. Industrial training also provides an opportunity to students to select an engineering problem and possibly an industry guide for their Major Project in final semester.

Industrial training of the students is essential to bridge the wide gap between the classroom and industrial environment. This will enrich their practical learning and they will be better equipped to integrate the practical experiences with the classroom learning process.

1.2 LEARNING THROUGH INDUSTRIAL TRAINING

During industrial training students must observe following to enrich their learning:

- Industrial environment and work culture.
- Organizational structure and inter personal communication.
- Machines/ equipment/ instruments - their working and specifications.
- Product development procedures and phases.
- Project planning, monitoring and control.
- Quality control and assurance.
- Maintenance system.
- Costing system.
- Stores and purchase systems.
- Layout of Computer/ EDP/MIS centres.
- Roles and responsibilities of different categories of personnel.
- Customer services.
- Problems related to various areas of Work etc.