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Faculty of Engineering
Scheme of Instruction and Syllabi

of

BE I - IV YEAR

OF
FOUR YEAR DEGREE COURSE

IN

COMPUTER SCIENCE & ENGINEERING

(With effect from the Academic Year 2013-2014)

July 2013
Osmania University
Hyderabad - 500 007.

6. A program using StringTokenizer.
7. A program using Linked list class.
8. A program using TreeSet class.
9. A program using HashSet and Iterator classes.
10. A program using map classes.
11. A program using Enumeration and Comparator interfaces.
12. A program to illustrate the usage of filter and Buffered I/O streams
13. A program to illustrate the usage of Serialization.
14. An application involving GUI with different controls, menus and ev handling.
15. A program to implement AWT/Swing.

WITH EFFECT FROM THE ACADEMIC YEAR 2011 - 20

CS 282

MICROPROCESSOR LAB

Instruction	3	Periods per we
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

PART A: 8085 PROGRAMMING USING MICROPROCESSO TRAINER KIT

1. Simple programming examples using 8085 instruction set. T understand the use of various instructions and addressing modes.
2. Interfacing and programming of 8255. (E.g. traffic light controller).
3. Interfacing and programming of 8254.
4. Interfacing and programming of 8279.

PART B: 8051 PROGRAMMING

1. Simple Programming examples using 8051 Micro Controller.
2. A/D and D/A converter interface.
3. Stepper motor interface.
4. Display interface.

SCHEME OF INSTRUCTION & EXAMINATION

B.E. IIIrd YEAR
(COMPUTER SCIENCE & ENGINEERING)

SEMESTER - I

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L	D/P		Univ. Exam	Sessi-onals
		THEORY					
1.	CS 301	Database Management Systems	4	-	3	75	25
2.	CS 302	Operating Systems	4	-	3	75	25
3.	CS 303	Automata, Languages and Computation	4	-	3	75	25
4.	CS 304	Software Engineering	4	-	3	75	25
5.	CM 371	Managerial Economics and Accountancy	4	-	3	75	25
6.	CS 305	Design & Analysis of Algorithms	4	-	3	75	25
		PRACTICALS					
1.	CS 331	DBMS Lab	-	3	3	50	25
2.	CS 332	OS Lab	-	3	3	50	25
3.	CS 333	Mini Project	-	3	-	-	25
		Total	**24**	**9**	**24**	**550**	**225**

CS 301

DATABASE MANAGEMENT SYSTEMS

Instruction	4	Periods per we
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Introduction : Database System Applications, Purpose of Datab Systems, View of Data, Database Languages, Relational Databas Database Design, Specialty Databases, Data Storage and Querying, D Mining and Information Retrieval, Database Architecture, Database Us and Administrators.

Database Design and E-R Model: Overview of the Design Proce The E-R Model, Constraints, E-R Diagrams, E-R Design Issues, Extend E-R Features, Reduction to Relation Schemas, Other Aspects of Databa Design.

UNIT-II

Relational Model: Structure of Relational Databases, Database Schem Keys, Relational Operations, Additional Relational Algebra Operatio Extended Relational Algebra Operations, Modification of the Databas

Structured Query Language: Overviews, Basic Structure of SQ Queries, Set Operations, Null Values, Additional Basic Operation Aggregate Functions, Nested Sub queries, Views, Join Expression.

UNIT-III

Advanced SQL: SQL Data Types , Integrity Constraints, Authorizatio Functions and Procedural Constructs, Recursive Queries , Trigger JDBC,ODBC, Embedded SQL.

Relational Database Design: Features of Good Relational Design Atomic Domains and First Normal form, Decomposition Using Function Dependencies, Functional Dependency Theory, Algorithm fo Decomposition, Decomposition using Multivalve Dependencies.

UNIT-IV

ndexing and Hashing: Basic Concepts, Ordered Indices, B+ Tree ndex Files, B Tree Index Files, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap ndices.

Transaction Management: Transaction Concept, Storage Structure Transaction Atomicity and Durability, Transaction Isolation and Atomicity, Serializability , Recoverability, Transaction Isolation Levels ,Implementation of Isolation Levels.

UNIT-V

Concurrency Control: Lock-Based Protocols, Timestamp-Based Protocols, Validation-Based Protocols, Multiple Granularity, Multiversion Schemes, Deadlock Handling, Insert or Delete Operations and Predicate Read , Concurrency in Index Structures.

Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Recovery Algorithms, Buffer Management, Failure with Loss of Nonvolatile Storage, ARIES, Remote Backup Systems.

Suggested Reading:

1. Abraham Silberschatz, Henry F Korth, S Sudarshan, " *Database System Concepts*", Sixth Edition, McGraw-Hill International Edition,2011
2. Date CJ, Kannan A, Swamynathan S, "*An Introduction to Database Systems*", Eight Edition, Pearson Education, 2006.
3. Raghu Ramakrishnan, Johnnes Gehrke, "*Database Management Systems*" , Third Edition, McGraw Hill,2003.
4. Ramez Elmasri, Durvasul VLN Somayazulu, Shamkant B Navathe, Shyam K Gupta, "*Fundamentals of Database Systems*", Fourth Edition, Pearson Education,2006.
5. Peter Rob, Carlos Coronel, "*Database Systems*", Thomson, 2007.

CS 302

OPERATING SYSTEMS

Instruction	4	Periods per we
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Introduction to operating systems: OS structure and strategies, Proc concept, Interprocess communication, Threads, Multithread programming.

Process scheduling: Scheduling criteria, Scheduling Algorithms, M Process scheduling, Thread Scheduling.

UNIT-II

Memory Management, swapping, contiguous allocation, paging, static a dynamic partition, demand paging, page replacement algorithms, thrashi segmentation with paging, Virtual memory.

File System Interface: File Concept, Access Methods, Directo Structure, File System Mounting, File sharing, protection.

File System implementation: File system structure, File syste implementations, Directory implementation, Allocation Methods, Fr space management, Efficiency and performance, recovery.

Case Studies: UNIX file system, Windows file system

UNIT-III

Process Synchronization: Critical section problem, semaphore, monitors.

Deadlocks: Necessary conditions, resource allocation graph, metho for handling deadlocks, preventions, avoidance, detection and recove protection, goals of protection, domain of protection, access matrix .

UNIT-IV

Device Management: Disk structure, Disk Attachment, Disk Schedulin Disk Management, RAID Structure, Stable storage implementation.

O System: I/O hardware, Application I/O interface, Kernel I/O ıbsystem, Transforming I/O request to hardware operation, STREAMS.

NIT-V

ase Studies:

INUX System: Design Principles, Kernel Modules, Process lanagement, Scheduling Memory Management, File Systems, Input and utput, Interprocess communication, Network Structure, Security.

/indows XP: Design Principles, Architecture, Environmental subsystem, lle Subsystem, Networking, Programming interface, Android OS

uggested Reading:

Abraham Silberchatz, Peter B.Galvin, Greg Gagne, *Operating System-Concepts*, Wiley India, 2006.

Andrew S.Tanenbaum, *Modern Operating Systems*, Third Edition, Pearson education, Asia-2008.

DhananjayM.Dhamdhere, *Operating System-concept based approach*, third edition, Tata McGraw Hill, Asia-2009.

Robert Love: *Linux kernel Development*, Pearson Education, 2004.

CS 303

AUTOMATA LANGUAGES AND COMPUTATION

Instruction	4	Periods per w
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Automata: Introduction to Finite Automata, Central Concepts of Autor Theory. Finite Automata: An Informal Picture of Finite Autom Deterministic Finite Automata, Non-deterministic Finite Automata, application, Finite Automata with Epsilon Transitions.

Regular expressions & Languages: Regular Expressions, Fi Automata and Regular Expressions, Applications of Regular Expressi Algebraic Laws for Regular Expressions.

UNIT-II

Properties of Regular Languages: Proving Languages not to be Regu Closure properties of Regular Languages, Decision Properties of Reg Languages, Decision Properties of Regular Language, Equivalence Minimization of Automata.

Context Free Grammars and Languages: Context free gramm Parses Trees, Applications, Ambiguity in Grammars and Languages.

UNIT-III

Pushdown Automata: Definition, Languages of PDA, Equivalence of PD and CFG's Deterministic Pushdown Automata.

Properties of Context Free Languages: Normal Forms for Cont Free Grammars, Pumping Lemma, closure properties, Decision Proper of CFL's.

UNIT-IV

Introduction to Turing Machines: Problems that Computers can Solve, The Turing machines, Programming Techniques for Turing Machin Extensions to the Turing 4 Machines Restricted Turing Machines, Tur machines and Computers.

IT-V

-decidability: A language that is not Recursively Enumerable, An decidable problem that is RE, Undecidable problems about Turing chines, Post's Correspondence Problem, Other Undecidable Problems.

tactable Problems: The Classes P and NP, an NP Complete Problem, Restricted Satisfiability problem.

ggested Reading :

John. E. Hopcroft, Rajeev Motwani, Jeffery, D. Ulman, *Introduction to Automata Theory, Languages and Computation,* 3nd edition, Pearson Education-2007.

John C.Martin, *Introduction to Languages and the Theory of Computation,* 3rd edition Tata McGraw Hill, 2003.

Bernard M.Moret, *The Theory of Computation,* Pearson Education, 2002.

CS 304

SOFTWARE ENGINEERING

Instruction	4	Periods per w
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT -I

Introduction to Software Engineering:

Generic view of Process: Software Engineering, Process Framew CMM, Process Patterns, Process Assessment, Personal and Te Process, Process Technology, Product and process.

Process Models: Perspective Models, Waterfall Model, Incremen Process Models, Evolutionary Process Models, Specialized Proc Models, The Unified Process.

An Agile View of Process: What is Agility, Agile Process, and Ag Process Models.

UNIT-II

Planning and Managing the Project: Tracking Progress, Proj Personnel, Effort Estimation, Risk Management, the Project Plan, Proc Models and Project Management, Information Systems Example, Re time Example.

Requirement Engineering: A bridge to design and constructi Requirement Engineering tasks, Initiating Requirement Engineering Proce Eliciting Requirement, Developing Uses cases, Building the Analysis Mod Negotiating Requirements, Validating Requirements.

UNIT-III

Building the Analysis Model: Requirements Analysis Modeli approaches, Data modeling concepts, Object oriented analysis , Scena based modeling, Flow oriented modeling, Class-based modeling, Creati a Behavioral Modeling.

esign Engineering: Design with in the context of SE, Design Process nd Design quality, Design concepts, The Design Model, Pattern-based oftware Design.

NIT-IV

reating Architectural Design: Software architecture, Data design, rchitectural Styles and Patterns, Architectural Design, Assessing alternative rchitectural Designs, Mapping data flow into software Architecture.

odeling Component-Level Design: What is a Component, Designing lass-Based components, Conducting Component–level Design, Object onstraint Language, Designing Conventional Components.

erforming User Interface Design: The Golden Rules, User Interface nalysis and Design, Interface Analysis, Interface Design Steps, Design valuation.

NIT-V

esting Strategies: A Strategic approach to software testing, strategic ssues, test strategies for O-O software, validation testing, system testing, rt of debugging.

esting Tactics: Software Testing Fundamentals, Black-Box and white ox Testing, basis path testing, Control Structure Testing, O-O Testing nethods, Testing Methods applicable on the class level, inter class Test ase design, Testing for Specialized environments, architectures and pplications, Testing Patterns.

roduct Metrics: Software quality, A framework for product metrics, letrics for the analysis model, metrics for the Design model, metrics for ource code, Metrics for Testing, Metrics for maintenance.

uggested Reading:

1. Roger S. Pressman, *"Software Engineering –A Practitioners Approach"*, 6th Edition, Pearson Education, India, 2005.
2. Shari Lawrence Pfleeger, *"Software Engineering Theory and Practices"* 4th Edition - Pearson Education, India, 2011.
3. Pankaj Jalote, *"An Integrated Approach to Software Engineering"*, 3rd Edition, Springer Link Edition, India, 2005.

CM 371

MANAGERIAL ECONOMICS AND ACCOUNTANCY

Instruction	4	Periods per wee
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Meaning and Nature of Managerial Economics: Manager Economics its usefulness to Engineers, Fundamental Concepts Managerial Economics, Scarcity, Marginalism, Equi-marginalis Opportunity costs, Discounting, Time Perspective, Risk and Uncertain Profits, Case study method.

UNIT-II

Consumer Behaviour: Law of Demand, Determinants, Kinds; Elastici of Demand (Price, Income and Cross-Elasticity); Demand Forecastin Law of Supply, Concept of Equilibrium. (Theory questions and sm numerical problems can be asked).

UNIT-III

Theory of Production and Markets: Production Function, Law Variable Proportion, ISO quants, Economics of Scale, Cost of Producti (Types and their measurement), Concept of Opportunity Cost, Conce of Revenue, Cost-Output relationship, Break-Even Analysis, Price – Outp determination under Perfect Competition and Monopoly (theory a problems can be asked).

UNIT-IV

Capital Management: Its significance, determination and estimation fixed and working capital requirements, sources of capital, Introducti to capital budgeting, methods of payback and discounted cash flo methods with problems. (Theory questions are numerical problems estimating working capital requirements and evaluation of capital budgeti opportunities can be asked).

UNIT-V

Book-keeping: Principles and significance of double entry book keepin Journal, Subsidiary books, Ledger accounts Trial Balance, concept an

reparation of Final Accounts with simple adjustments, Analysis and nterpretation of Financial Statements through Ratios.

Theory questions and numerical problems on preparation of final accounts, ash book, petty cash book, bank reconciliation statement, calculation of ome ratios).

uggested Reading:

. Mehta P.L., "*Managerial Economics – Analysis, Problems and Cases*", Sulthan Chand & Son's Educational publishers, 2011.

2. Maheswari S.N. "*Introduction to Accountancy*", Vikas Publishing House, 2005.

3. Panday I.M. "*Financial Management*", Vikas Publishing House, 2009.

CS 305

DESIGN AND ANALYSIS OF ALGORITHMS

Instruction	4	Periods per w
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Introduction, Algorithm_Specification, Performance analysis, Sp Complexity, Time Complexity, Asymptotic Notation(O,Omega,The Practical Complexities, Performance Measurement, Review of elemen data structure- Heap and Heap Sort, Hashing, Set representation. UNI FIND.

UNIT-II

Divide-and Conquer: The general method, finding maximum minim Merge sort quick sort and selection.

Greedy Method: Knapsack problem, Optimal Storage on tapes, sequencing with deadlines, Optimal merge patterns, Minimum Spann Trees.

UNIT-III

Dynamic Programming And Traversal Technique: Multistage gra All Pair Shortest Path, Optimal Binary Search trees,0/1 Knapsa Reliability Design, Traveling Salesman Problem, Bi connected Compone and Depth First Search.

UNIT-IV

Backtracking and Branch and Bounds: 8-Queens Problem, Gra Coloring Hamilton cycle, Knapsack Problem, 0/1 Knapsack Proble Traveling salesperson problem, Lower-Bound Theory.

UNIT-V

NP-Hard and NP-Completeness: Basic concepts, cook's theorem, N hard graph problems and scheduling problem, NP-hard code generati

roblems, Clique Decision problem, Node covering decision, Scheduling roblem, NP hard code generation problem.

uggested Reading:

. Horowitz E. Sahani S: *"Fundamentals of Computer Algorithm"*, Galgotia Publications.

. Anany Levitin, *"Introduction to the Design & Analysis. of Algorithms"*, Pearson Education, 2000.

. Aho, Hopcroft, Ulman, *"The Design and Analysis of Computer Algorithm"*, Pearson Education, 2000.

. Parag H. Dave, Himanshu B. Dave *"Design and Analysis of Algorithms"* Pearson Education, 2008.

CS 331

DATABASE MANAGEMENT SYSTEMS LAB

Instruction	3	Periods per w
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

1..SQL

a. Creating Database (Exercising commands like DDL,DML,D and TCL)

b. Exercising all types of Joins

c. Creating tables in I Normal ,II Normal , III Normal and B Form.

d. Creating table using combination of constraints.

e. Exercising Simple to Complex Queries

f. Usage of Stored Functions.

g. Creating Password and Security features for an Applicatio

h. Usage of File locking, Table locking facilities in an Applicati

2. PL/SQL

a. Demonstration of Blocks, Cursors, Procedures, Functions Packages.

b. Demonstrate Exception Handling .

c. Usage of Triggers to perform operation on Single and Multi Tables.

d. PL/SQL Procedures for data validation

3.FORMS

Creation of forms for College Information System, Library Information System and Recruitment Cell.

4. REPORTS

a. Creation of Reports based on different queries .

b. Creation of small full fledged Database Application spread o 3 sessions.

ote : The creation of sample database for the purpose of the experiments is Expected to be pre-decided by the instructor.

uggested Reading :

. Nilesh Shah, *"Database Systems Using Oracle"*, PHI,2007.

. Rick F Van der Lans, *"Introduction to SQL"*, Fourth Edition, Pearson Education, 2007.

. Benjamin Rosenzweig, Elena Silvestrova, *"Oracle PL/SQL by Example"*, Third Edition, Pearson Education,2004.

. Albert Lulushi, *"Oracle Forms Developer's Handbook"*, Pearson Education, 2006.

S 332

OPERATING SYSTEMS LAB

istruction	3	Periods per week
uration of University Examination	3	Hours
niversity Examination	50	Marks
essional	25	Marks

. Printing file flags for specified descriptor.

. Print type of file for each command line arguments

. Recursively descend a directory hierarchy counting file types

. Program using process related system calls

. Program s to create threads

. Implement CPU scheduling algorithms (a) Round Robin (b) SJF (c) FCFS

. Implement page replacement algorithms (a) FiFo (b) LRU

. Echo server using pipes

. Echo server using messages

0. Producer- Consumer problem using shared memory.

1. Readers – Writers problem using message passing

2. Dinning philosopher problem using semaphore

3. Bankers algorithm for Deadlock detection and avoidance

4. Program using file locking

5. Programs using LINUX shell scripts.

6. Case study of android OS

CS 333

MINI PROJECT

Instruction 3 Periods per we

Sessional 25 Marks

The students are required to carry out mini projects in any c areas such as Data Structures, Microprocessors and Interfacing, Data Management Systems, Operating Systems, Design and Analys Algorithms, and Software Engineering.

Students are required to submit a report on the mini proje the end of the semester.

SCHEME OF INSTRUCTION & EXAMINATION

B.E. IIIrd YEAR
(COMPUTER SCIENCE & ENGINEERING)

MESTER-II

Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
		Periods per week		Duration In Hours	Maximum Marks	
		L	D/P		Univ. Exam	Sessi-onals
	THEORY					
CS 351	Web Programming & Services	4	-	3	75	25
CS 352	Compiler Construction	4	-	3	75	25
CS 353	Principles of Programming Languages	4	-	3	75	25
CS 354	Object Oriented System Development	4	-	3	75	25
CS 355	Computer Networks	4	-	3	75	25
	PRACTICALS					
CS 381	WPS & CN Lab	-	3	3	50	25
CS 382	OOSD Lab	-	3	3	50	25
CS 383	Compiler Construction Lab	-	3	3	50	25
CS 384	Mini Project	-	3	-	-	25
	Total	**20**	**12**	**24**	**525**	**225**

CS 351

WEB PROGRAMMING & SERVICES

Instruction	4	Periods per
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Web basics and overview: introduction to Internet, World Wide Web Browsers, URL, MIME, HTTP, Web programmer's to Introduction to XHTML. Basics of Java script.

Introduction to XML, XML Document structure, DTD, namesp Schemas, XSLT style sheets, XML Processors

UNIT-II

The J2EE Platform: Enterprise Architecture styles, J2EE Archite – Containers, J2EE Technologies, Deploying J2EE applica Introduction to Web containers

Servlet Programming: Overview of Java Servlet API, Se implementation, Servlet Configuration, Servlet Exceptions, Servlet cycle, Request and Responses.

Servlet Sessions, Context, and collaboration: Approaches to Se tracking, Session Tracking with Java Servlet API, Servlet Context, Se Collaboration

UNIT-III

Filters for Web applications: What is a Filter, Sample Filter, Filter Deployment Descriptor for Filters, Chat Application with Filters.

Web Deployment, Authentication, and Packaging: Web applica structure, Mapping requests to applications and servlets, Securing applications, Deploying configuration.

JSP Basics and architecture: Introduction to JSP, Jsp Directi Scripting Elements, Standard Objects, JSP Design strategies.

SP Tag extensions: Tag extensions, A simple Tag Anatomy of a Tag xtension, Writing Tag extensions, Application life cycle events

NIT-IV

ava Mail: Mail protocols, Java Mail Overview, Installation and onfiguration, Jaya mail API, working with Mail, Java mail resources

atabase Programming with JDBC: Database Drivers

java.sql package: JDBC Process, Different types of statements, etrieving meta information from Database and ResultSet

avax.sql package: JDBC Data sources, Connection pooling, Distributed ransactions, RowSet objects

UNIT-V

NET Platform: Introduction to .NET Framework, Common type systems, Common Language Runtime.

Introduction to C#, Types and Objects, Program structure.

Introduction to ASP.NET: The basics, ASP.NET documents, Code behind files

ASP.NET controls- HTML controls, Life cycle, page level events, control events, web controls, creating controls with in code, Response output for controls, validation controls

.NET Remoting, Database Connectivity with ADO.NET

Suggested Reading:

1. Subramnyam Allamraju, *Professional java server programming J2EE* 1.3 Edition, Cedit Buest. Apress Publications
2. Robert W Sebesta, *Programming the World Wide Web*, Pearson Education
3. Joe Duffy, *Professional .NET Framework 2.0*, Wiley India 2007.

CS 352

COMPILER CONSTRUCTION

Instruction	4	Periods per w
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Introduction – Programs related to compilers. Translation process. M data structures. Other issues in compiler structure. Boot strapping porting.

Lexical analysis – The role of Lexical Analyzer. Input Bufferi Specification of Tokens. Recognition of Tokens. The Lexical-Analy Generator Lex.

UNIT-II

Syntax Analysis – Introduction. Top-Down parsing, Brute Forci Recursive Descent, Predicative LL(1), Bottom-Up parsing : Introducti to LR Parsing, Powerful LR parsers SLR, CALR, LALR, Usi Ambiguous Grammars, Parser Generators - Yacc.

UNIT-III

Syntax Directed Translation – Syntax Directed Definitions. Evaluati Orders for SDDs. Applications of Syntax Directed Translation.

Symbol Table Organization - Structure of Symbol table, Symbol Tab organization for Block Structured and non block Structure languages, Da Structures of symbol Table.

UNIT-IV

Intermediate code generation : Variants of syntax trees. Three-Addre Code, Types and Declarations. Translation of Expressions. Type Checkin Control Flow.

Storage Organization. Stack Allocation of Space. Access to Non loc Data on the Stack. Heap Management. Introduction to Garbag Collection.

NIT-V

ode Generation – Issues in the Design of a Code Generator. The arget Language. Addresses in the Target Code Basic Blocks and Flow raphs. Optimization of Basic Blocks. Peephole Optimization. Register llocation and Assignment. Machine Independent Optimizations – The rincipal Sources of Optimizations, Introduction to data flow analysis, oundation of data flow analysis.

rror Recovery : Introduction, Error detecting and Reporting in various hases, Lexical Errors, Syntax Errors handling, and error Recovery in arious Phases.

uggested Reading:

- Alfred V Aho, Monica S Lam, Ravi Sethi, Jeffrey D Ullman – *Compilers: Principles, Techniques & Tools,* Pearson Education 2nd Edition 2007.
- Keith D Cooper & Linda Tarezon, *Engineering a Compiler,* Morgan Kafman, Second edition.
- Lex & Yacc, John R Levine, Tony Mason, Doug Brown, Shroff Publishers.
- Kenneth C Louden, *Compiler Construction: Principles and Practice*, Cengage Learning.
- Lex & Yacc, John R Levine, Oreilly Publishers.

CS 353

PRINCIPLES OF PROGRAMMING LANGUAGES

Instruction	4	Periods per we
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Introduction:

The Art of Language Design, Programming Language Spectrum, W
Study Programming Languages? Compilation and Interpretati
Programming Environments, Overview of Compilation.

Programming Language Syntax:

Specifying Syntax: Regular Expressions and Context-Free Gramm
Scanning, Parsing,

UNIT-II

Names, Scopes, and Bindings:

The Notion of Binding Time, Object Lifetime and Storage Managem
Scope Rules, Implementing Scope, The Meaning of Names withi
Scope, The Binding of Referencing Environments, Macro Expansi
Separate Compilation

Control Flow:

Expression Evalu n, Structured and Unstructured Flow, Sequenci
Selection, Iteration. .ecursion, Non determinacy

UNIT-III

Data Types:

Type Systems, Type Checking, Records (Structures) and Variants (Unio
Arrays, Strings, Sets, Pointers and Recursive Types, Lists, Files and In
Output, Equality Testing and Assignment.

Subroutines and Control Abstraction:

Review of Stack Layout, Calling Sequences, Parameter Passing, Gene
Subroutines and Modules, Exception Handling, Events

UNIT-IV

Data Abstraction and Object Orientation:

Object-Oriented Programming, Encapsulation and Inheritance, Initialization and Finalization, Dynamic Method Binding, Multiple Inheritance.

Concurrency:

Concurrent Programming Fundamentals, Implementing Synchronization, Language-Level Mechanisms, Message Passing

UNIT-V

Run-time Program Management:

Late Binding of Machine Code, Inspection/Introspection

Functional Languages:

Functional Programming Concepts, A Review/Overview of Scheme, Evaluation Order Revisited, Higher-Order Functions, Theoretical Foundations, Functional Programming in Perspective

Logic Languages :

Logic Programming Concepts, Prolog, Theoretical Foundations, Logic Programming in Perspective

Suggested Reading:

1. *Programming Language Pragmatics,* 3/ e, Michael Scott, Elsevier, Morgan Kaufmann, 2009.
2. *Concepts of Programming languages,* Sebesta, 8/ e, Pearson.
3. *Programming Languages Design and Implementation ,* 4/e Pratt ,Zelkowitz, PHI
4. *Programming Languages*, Louden, 2 /e, Cengage, 2003

CS 354

OBJECT ORIENTED SYSTEM DEVELOPMENT

Instruction	4	Periods per we
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

UML Introduction : Necessity of a Model, Introducing the UML, Hello World.

Basic Structural Modeling: Classes, Relationships, Common Mechanism Diagrams, Class Diagrams.

Advanced Structural Modeling: Advanced Classes, Advanced Relationshi Interfaces, Types and Roles, Packages, Instances, Object Diagrams, Components.

UNIT-II

Basic Behavioral Modeling: Interactions, Use Cases, Use Case Diagrams, Interacti diagrams, Activity diagrams.

Advanced Behavioral Modeling: Events and Signals, State Machines, Process and Threads, Time and space, State Chart Diagrams.

UNIT-III

Architectural Modeling: Artifacts, Deployment Collaborations, Patterns and Fram works, Artifact diagrams, Deployment diagrams, Systems and models.

UNIT-IV

Unified Software Development Process: The Unified Process, The Four Ps, Use-Case-Driven Process, An Architecture-Centric Processes, An Iterative a Incremental Process.

UNIT-V

Core Workflows: Requirements Capture, Capturing Requirements as Use Cas Analysis, Design, Implementation, Test.

Suggested Reading:

1. Grady Booch, James Rumbaugh, Ivor Jacobson, *"The Unified Modeling Languag User Guide"* (Covering UML 2.0), 2nd Edition, Pearson Education, India, 2007.
2. Ivor Jacobson, Grady Booch, James Rumbaugh: *"The Unified Softwar Development, Process"* Pearson Education, India, 2008.

CS 355

COMPUTER NETWORKS

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNI T-I

Introduction: Uses of Computer Networks, Network Hardware, Network Software: Reference Models (ISO - OSI, TCP/IP).

Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control
Algorithms, Quality of Service

UNI T-II

Internetworking: Concatenated virtual circuits, connectionless internetworking, tunneling, Internetwork routing, fragmentation.

Network layer in the Internet: IP protocol, IP addresses, Internet control protocols, OSPF, BGP, internet multicasting, mobile IP, Ipv6.

Transport Layer: The Transport Service, Elements of Transport Protocols, The Internet Transport Protocols: UDP, Internet Transport Protocols: TCP.

UNIT-III

Network Programming

Socket Interface: Sockets, Socket Address, Elementary Sockets, Advanced Sockets, Socket Options, Asynchronous I/O, Input / Output Multiplexing, Out of Band Data, a n d Internet Super Server.

Remote Procedure Calls: Introduction, Transparency Issues and Sun RPC.

UNI T-IV

Application Layer:

Domain Name System: DNS Name Space, Resource Records, Name Servers.

Electronic Mail: Architecture and Services, User Agent, Message Formats, Message transfer and Final Delivery.

World Wide Web: Architectural Overview, Static Web Docume dynamic Web documents, HTTP, Wireless Web.

Multimedia: Digital Audio, Streaming Audio, Voice over IP, Video on Demand.

UNI T-V

Network Security: Cryptography, symmetric key algorithms, Pub key Algorithms, Digital Signatures, Management of Public Ke Communication Security, Authentication protocols, E-mail security, security.

Suggested Reading:

1. Andrew S. Tanenbaurn, *"Computer Nerworks"*, 4th Editi Pearson Education.
2. W. Richard Stevens, *"Unix Network Programming"*, Pear Education 2006.
3. James F. Kurose, Keith W, Ross, *"Computer Networking, At Down Approach Featuring the Internet"*, 2nd Edition, 2003.
4. William Stallings: *"Computer Networking with Internet Protoc and Technology"*, Pearson Education, 2004.

WITH EFFECT FROM THE ACADEMIC YEAR 2012 - 2

CS 381

WEB PROGRAMMING AND NETWORKING LAB

Instruction	3	Periods per wee
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

Web Programming Experiments:

1. Creation of static web site using XHTML.
2. Demonstration of XML, XSLT.
3. Validation of static web page using Java script.
4. Creation of dynamic content in web application using servlets.
5. Handling Sessions in web applications.
6. Usage of Filters in web applications.
7. Creation of dynamic content in web application using JSP.
8. Creation of dynamic content in web application using ASP.NET

Providing data store support for web site using JDBC

etwork Programming Experiments:

). Understanding and using the following commands. Ifconfig, netstat, ping, arp, telnet, tftp, ftp.

Implementation of concurrent and iterative Echo server using both connection oriented and connectionless Socket System Calls.

Implementation of time of the day service as Connection Oriented Concurrent Server using Socket System Calls.

Build a concurrent Multithreaded File Transfer Server. Use separate Threads to allow the server to handle multiple clients concurrently.

Implementation of Remote Program execution using Socket system calls. Programs to demonstrate the usage of Advanced Socket System calls Like Getsockopt(), Setsockopt(), Select(), Readv(), getpeernanel(), Getsockname()

Implement a Concurrent Chat Server that allows currently logged in users to communicate with one another. Use Socket System calls

Implementation of Remote files Access using RPC.

WITH EFFECT FROM THE ACADEMIC YEAR 2012 - 2013

S 382

OOSD LAB

struction	3	Periods per week
uration of University Examination	3	Hours
niversity Examination	50	Marks
essional	25	Marks

elect one large Information System/Approach and device the following sing CASE TOOL.

Data Flow diagram. 2. E-R diagram.

Dynamic Model and Using Finite State Automata.

Software Requirement Specification Document (SRS)

Functional Decomposition and Structure.

Data Dictionary. 7. Module Specifications.

Test Data Generation. 9. Cost and Resource Estimates.

0. Verification

1. User Manual

2 Study of Software Maintenance Tools (SCCS, Debug Tools).

3. A case study using Case Tool supporting UML.

CS 383

COMPILER CONSTRUCTION LAB

Instruction	3 Periods per w
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

1. Scanner programs using C
2. Scanner programs using LEX
3. Finding first set and follow set of productions
4. Top down parsers (Recursive decent parser, LL(1) parser, etc.)
5. Bottom up parsers (LR, SLR etc.)
6. Parser programs using YACC
7. Intermediate code generation
8. Code optimization

CS 384

MINI PROJECT

Instruction	3 Periods per wee
Sessional	25 Marks

The students are required to carry out mini projects in any of the areas such Data Communications, Web Programming & Services, Computer Networks, Compil Construction, and Object Oriented System Development.

Students are required to submit a report on the mini project at th end of the semester.

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SCHEME OF INSTRUCTION & EXAMINATION

B.E. IV - YEAR
(COMPUTER SCIENCE & ENGINEERING)

SEMESTER - I

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L	D/P		Univ. Exam	Sessi-onals
		THEORY					
1	CS 401	Distributed Systems	4	-	3	75	25
2	CS 402	Artificial Intelligence	4	-	3	75	25
3	CS 403	Information Security	4	-	3	75	25
4	CS 404	Principles & Applications of Embedded Systems	4	-	3	75	25
5		ELECTIVE-I	4	-	3	75	25
		PRACTICALS					
1	CS 431	Distributed Systems Lab.	-	3	3	50	25
2	CS 432	Embedded Systems Lab.	-	3	3	50	25
3	CS 433	Project Seminar	-	3	3	-	25
		Total	**20**	**9**	—	**475**	**200**

ELECTIVE-I

CS 411	Software Project Management
CS 412	Computer Graphics
CS 413	Image Processing
CS 414	Adhoc and Sensor Networks
CS 415	Soft Computing
CS 416	Mobile Computing
CS 417	Real Time Systems