Shiv Chhatrapati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya, Latur (Autonomous)

Curriculum

2018-2019

B.Sc. C.S.

(CC/AECC/SEC/GE)

UG Third Year Semester V & VI

Under Non CBCS

Three Year Degree Programme in B.Sc.C.S.

(Six Semester Course)

Syllabi approved by the Board of Studies in

B.Sc.C.S. with effect from June, 2015

Rajarshi Shahu Mahavidyalaya (Autonomous), Latur
Department of Information Technology
Syllabus outline of B.Sc.C.S. Third Year
Under Non CBCS Pattern

Semester : V

Course Code	Course Title	Maximum Marks		Total Marks	Credits
		Internal	End Semester		
U-APR-587	Aptitude and Reasoning	20	30	50	2
U-LOS-588	Linux Operating System	20	30	50	2
U-COJ-589	Core Java	20	30	50	2
U-DIP-590	Digital Image Processing	20	30	50	2
U-ORA-591	Oracle 10g DBA	20	30	50	2
U-LAC-592	Lab Course (Linux OS)	20	30	50	2
U-LAC-593	Lab Course (Core Java)	20	30	50	2
U-LAC-594	Lab Course(DIP)	20	30	50	2
U-LAC-595	Lab Course (DBA)	20	30	50	2
U-PRO-617	Mini Project	--	50	50	2
	Seminar	--	50	50	2
	Environmental Studies (**NCBC**)	20	30	50	--
	Total(V)			**550**	**22**

Semester : VI

Course Code	Course Title	Maximum Marks		Total Marks	Credits
		Internal	End Semester		
U-PCD-687	Principles of Compiler Design	20	30	50	2
U-WPU-688	Web Programming using PhP	20	30	50	2
U-COG-689	Computer Graphics	20	30	50	2
U-ADJ-690	Advance Java	20	30	50	2
U-TCI-691	TCP/IP	20	30	50	2
U-LAC-692	Lab Course(CD)	20	30	50	2
U-LAC-693	Lab Course (PHP)	20	30	50	2
U-LAC-694	LAB Course(CG)	20	30	50	2
U-LAC-695	Lab Course(Adv. Java)	20	30	50	2
U-PRO-	Major Project	--	--	100	4
	Total(VI)			**550**	**22**
	Total (Semester V+ VI)			**1100**	**44**

Semester -V

Total Lectures: 5   **Total Marks: 50**
                                                                  Credits: 2

Learning Objectives
This course is designed to suit the need of the outgoing students and to acquaint them with frequently asked patterns in quantitative aptitude and logical reasoning during various examinations and campus interviews.

Course Outcomes
On successful completion of the course the students will be able to:
- Understand the basic concepts of quantitative ability
- Understand the basic concepts of logical reasoning Skills
- Acquire satisfactory competency in use of reasoning
- Solve campus placements aptitude papers covering Quantitative Ability, Logical Reasoning Ability
- Compete in various competitive exams like CAT, CMAT, GATE, GRE, GATE, UPSC, GPSC etc.

Syllabus
UNIT - I
1. Quantitative Ability – 1
  1.1. Number Systems
  1.2. LCM and HCF
  1.3. Percentages
  1.4. Profit, Loss and Discount
  1.5. Interest (Simple and Compound)
  1.6. Speed, Time and Distance
  1.7. Time and Work
  1.8. Averages
  1.9. Ratio and Proportion
  1.10. Linear Equations
  1.11. Quadratic Equations
  1.12. Complex Numbers

UNIT - II
2. Quantitative Ability – 2
  2.1. Logarithm
  2.2. Progressions (Sequences & Series)
  2.3. Binomial Theorem
  2.4. Surds and Indices
  2.5. Inequalities
  2.6. Permutation and Combination
  2.7. Probability
  2.8. Functions
  2.9. Set Theory

2.10. Geometry
2.11. Co-ordinate Geometry
2.12. Trigonometry
2.13. Mensuration

3. UNIT – III Data Interpretation
3.1. Data Interpretation
3.2. Tables
3.3. Column Graphs
3.4. Bar Graphs
3.5. Line Charts
3.6. Pie Chart
3.7. Venn Diagrams

4. UNIT – III Logical Reasoning
4.1. Logical Reasoning
4.2. Number and Letter Series
4.3. Calendars
4.4. Clocks
4.5. Cubes
4.6. Venn Diagrams
4.7. Binary Logic
4.8. Seating Arrangement
4.9. Logical Sequence
4.10. Logical Matching
4.11. Logical Connectives
4.12. Syllogism
4.13. Blood Relations

Reference books:
1. Analytical and Logical reasoning By Sijwali B S
2. Analytical and Logical reasoning for CAT and other management entrance test By Sijwali B S
3. How to prepare for the interpretation and logical reasoning for the CAT By Sharma Arun
4. Quantitative aptitude (Numerical Ability) by Agrawal Chandresh
5. Quantitative aptitude for Competitive examination By R S A

Total Lectures: 50   **Total Marks: 50**
                                                                                              Credits: 2

Learning Objectives
- Understand basics of Linux Operating System along with its file system structure
- Understand ownership and permissions of the files and directories.
- How to set permissions files/directories
- How to manipulate files/directories – list files, create, delete, and move
- Understand basics of vi - a standard Unix text editor

Course Outcomes
- Be familiar with different Linux commands used for different purposes.
- Be familiar with various types of operating systems including Unix.
- Student should be able to general purpose related commands.
- Student should be able to execute the file, directory and he also should be also to able to assign the permissions to file or directory.
- Student should be able to create, modify and delete the user.
- Student should be able to compress and decompress the file.
- Student should execute the programs in vi - editor.

SYLLABUS

UNIT I: Introduction to LOS & File system and Devices

1. Introduction
1.1. History of Linux
1.2. Directory structure of Linux
1.3. Comparison of various operating systems
1.4 Study of various storage devices
1.5 Advantages of Linux, Flavors of Linux, Installation notes, Linux Loader,Linux kernel, linux filesystem

2. File System and Devices
2.1. File System concept ext3, ext2.
2.2. File systems: - mount, fsconf and other related commands

UNIT II: Linux commands & File permissions
3. Linux commands
3.1. General Purpose Utilities – - Man, who, login, logout, shutdown, passwd.
3.2. File management commands – cat, cp, rm, mv, wc,
3.3. Filter related commands – grep, wc, head, tail, sort
3.4. Directory management commands – pwd, cd, mkdir, rmdir, ls
3.5. Checking directories and permissions – pwd, chmod, cd, ls
3.6. Compression commands- zip, unzip, gzip, gunzip,
3.7. printer related commands- lpc, lpr, lpq. lprm

4. Working with permissions
4.1. Assigning file permissions
4.2. Directory Permission
4.3. Using text editors
4.4. Working with vi & emacs
4.5. System services and run levels
4.6. Controlling services at boot with administration tools (chkconfig & using GUI based services)

UNIT III: System Administration

5. System Administration
5.1. Performing system maintenance
5.2. Communication commands: write, wall, talk, mesg, motd
5.3. Pre-login Message
5.4. Managing software with RPM: Installing, Uninstalling, Upgrading
5.5. Managing users and managing Groups and managing passwords.

UNIT IV: Backup Strategies and Network Configuration

6. Backup strategies
6.1. Choosing Backup Strategies and Operations
6.2. Choosing Backup hardware and media.
6.3. Using backup software and commands

7. Network Configuration for Linux
7.1. Network configuration tools
7.2. Dynamic host configuration protocol.
7.3. Network files system.
7.4. Introduction to samba
7.5. Introduction to DNS & Apache web server

Reference Books:
1 Bill Ball, David Pitts, "Red Hat Linux 7 Unleashed", Techmedia SAMS Publication
2 Evi Nemeth, Garth Snyder, Scott Seebass, Trent R. Hein, "UNIX System Administration
3 Handbook" Person Education Asia (LPE) (3rd Edition)
4 Red hat Linux & fedora unlashed Authors Bill Ball & Hoyt Dust.

Course Title: Core Java
Course Code: U-COJ- 589

Total Lectures: 50
Total Marks: 50
Credits: 2

Learning Objective
- Implement Object Oriented Programming Concepts.
- Use and create packages and interfaces in a Java program,
- Implement multithreading concept.
- Learn how to build desktop application.

Course Outcomes
- Implement Object Oriented Programming Concepts.
- Use and create packages and interfaces in a Java program.
- Implement collection framework classes.
- Create final year project with database connectivity.

Syllabus

Unit I Introduction to Java programming

1. An Introduction to Java
A Short History of Java, Features of Java, Comparison of Java and C++, Java virtual machine, Command Line Arguments, Java program structure, Creating and Running Java Programs, Command Line Arguments

2. Classes and Objects
Introduction, Defining a class, Adding variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors. Method Overloading, Static Members.

Unit II Implementing and Learning Object Oriented Concepts

3. Inheritance
Extending a class, Overriding Method, using super, Final variable and Methods, this keyword.

4. Arrays, Strings and Vectors
Introduction, One-dimensional and Two-dimensional Arrays, String Arrays, String Method, Creating and using vector.

Unit III   Thread, Interface & Package

5. Packages and Interface
Java API package, Using system packages, Creating Packages & Using a Package, Interface Introduction, creating and using interfaces.

6. Multithreaded Programming
Introduction, Life Cycle of a Thread, Creating Threads, Extending the Thread Class, Stopping and Blocking a Thread, Thread Priorities, Synchronization

Unit IV Collection Framework

7. Working with Collections
Introduction to the Collection framework, collection classes: Set, Lists, Queue, HashSet, TreeSet, Iterator, hashtables and hashmap.

Reference Books :
1) Complete reference Java by Herbert Schildt(5th edition)
2) Programming with Java , A primer ,Forth edition , By E. Balagurusamy
3) Core Java Volume-I- Fundamentals, Eighth Edition, Cay S. Horstmann, Gary Cornell, Prentice Hall, Sun Microsystems Press.

Website References
- http://tutorialpoint.com
- **https://www.w3schools.in**

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Course Title: Digital Image Processing
Course Code: U-DIP-590

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Total Lectures: 50   **Total Marks: 50**
                                                                                                Credits: 2

Learning Objectives:
- To study image processing concepts
- To study mathematics and algorithms for image processing
- To study applications in image processing
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Course Outcome:
- Describe fundamental steps used in digital image processing
- Understand applications of digital image processing
- Perform survey on image processing techniques
- Designand implement image processing programs with applying algorithms
- Solve Image Processing problems
- Describe different modalities and current techniques in image processing (overview)
- Describe how digital images are represented and stored efficiently depending on the desired quality, color depth
- Use the mathematical principles of digital image enhancement (contrast, noise)
- Describe and apply the concepts of filtering techniques
- Analyze the algorithms used in image processing to perform designated tasks using MATLAB
- Apply the knowledge primarily obtained by studying examples and cases in the field of biomedical imaging to other engineering disciplines.

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Syllabus

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UNIT- I   Introduction to DIP
What is digital image processing? Example fields of digital image processing, Fundamental steps in digital image processing, Components of image processing system, Elements of visual perception, Lights and electromagnetic spectrum, Image sensing and acquisition, Image sampling and quantization, Some basic relationship between pixels.

Unit –II   Digital Image Representation using Matlab
Digital Image Representation: Coordinate Conventions, Images as Matrices, Reading Images, Displaying Images, Writing Images, Data Classes, Image Types: Intensity Images, Binary Images, Converting between Data Classes and Image Types: Converting between Data Classes, Converting between Image Classes and Types, Array Indexing: Vector Indexing, Matrix Indexing, Selecting Array Dimensions, Some Important Standard Arrays. Introduction to M-Function Programming: M-Files, Operators, Flow Control, Code Optimization, Interactive I/O

Unit- III   Intensity transformation using Matlab
Intensity Transformation Functions: Function imadjust, Logarithmic and Contrast-Stretching Transformations, Some Utility M-Functions for Intensity Transformations, Histogram Processing and Function Plotting: Generating and Plotting Image Histograms, Histogram Equalization, Histogram Matching (Specification), Spatial Filtering: Linear Spatial Filtering, Nonlinear Spatial Filtering

Unit –IV   Frequency Domain Processing and Histogram Processing

Frequency Domain Processing: The 2-D Discrete Fourier Transform, Computing and Visualizing the 2D-DFT in MATLAB, Filtering in the Frequency Domain: Fundamental Concepts, Basic Steps in DFT Filtering, A Model of the Image Degradation/Restoration Process, Color Image Representation in MATLAB: RGB Images, Indexed Images IPT Functions for Manipulating RGB and Indexed Images.

Reference Books:

1. Digital Image Processing Using MATLAB by Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins
2. Digital Image Processing by Rafael C. Gonzalez, Richard E. Woods

Total Lectures: 50

Total Marks: 50
Credits: 2

Learning Objectives

The purpose of database administration is to provide reliable, consistent, secure, and available corporate-wide data. This course provides detailed information about the roles performed by database administrator, distinguishes database administration and data administration, and describes several database operation and maintenance issues.

Course Outcomes

After successful completion of this course student will be able to:

-Maintain all aspects of a database and make sure that data is consistent in the database and clearly defined

-Work in a variety of industries as a DBA

-Ensure databases are secure and solves troubleshoot problems

-Monitor user access, determine user needs, design databases, perform tests and ensure standards

-Get important skills include technical, communication, analytical and problem-solving skills.

Syllabus

Unit I DBA Basics and Tablespaces

1. Basics of DBA

Functions of DBA, Oracle Instance- Starting and Stopping Instance, Memory Architecture-Oracle 10G Memory structure, Background Process, Physical Database Structure -Control file , Data file , Online Redo log file, Archive file, trace file, alert log file, parameter file SP file password file, Manual Database creation

2. Tablespaces

Introduction to tablespaces - Types of tablespaces - SYSTEM, SYSAUX, Big file, Undo, default, temporary, online, offline tablespaces, read only tablespaces, Working with tablespaces, Creating tablespaces, altering tablespaces, modifying tablespaces, Management of tablespaces

Unit II Database Layouts, Backup and Recovery

3. Physical Database Layouts and Storage Management.

Traditional disk space storage, Resizing tablespaces and database, Moving datafile, Moving online redo log file, Moving control files, Undo basics - roll back, read consistency, database recovery, flash back operations

4. RAC Database, Backup and Recovery Options

Overview of Real Application Clusters, RAC database characteristics, Logical Backup - data pump export/import process, Physical backup - Offline online backup, Flash Recovery area

Unit III RMAN and Database Tuning

5. Using Recovery Manager RMAN
RMAN features & components, RMAN vs Traditional backup method, Overview of RMAN commands & options

6. Database Tuning
Tuning - application design, effective table design, Distribution of CPU requirements, Effective application design, Tuning SQL, Impact of order of load rates, Additional Indexing options, Generating explain plan.

Unit IV Database Security and Auditing

7. Database Security & Auditing
Non database security, database authentication methods, databsse authentication, DBA authentication, user accounts, database authorization methods, auditing.

Reference Books
1. Oracle database 10G DBA handbook by Kevin Loney, Bob Bryla Oracle Press
2. OCP oracle database 10G New features for admininstrators exam guide By SAM R Alapati

Total Marks: 50   **Credits:2**

Learning Objectives:
- Teach Basics of Linux Operating System
- Teach ownership and permissions of the files and directories.
- Explain why these issues exist.
- How to set permissions files/directories
- How to manipulate files/directories – list files, create, delete, and move just about anything on the file system
- Mention vi - a standard Unix text editor

Course Outcomes:
- Master functions, structures and history of operating systems
- Master understanding of design issues associated with operating systems
- Master various process management concepts including scheduling, synchronization, deadlocks
- Master concepts of memory management including virtual memory
- Master system resources sharing among the users
- Master issues related to file system interface and implementation, disk management
- Be familiar with different Linux commands used for different purposes.
- He also should be also to able to assign the permissions to file or directory.
- Student must be able to create ,modify and delete the user.
- Student should be able to compress and decompress the file. Student should be able to compress and decompress the file.

Proposed Practical List:
1) Installation of Linux O.S.
2) Study of General Purpose related commands.
3) Study of File related commands.
4) Study of Directory related commands.
5) Study of Filter related commands.
6) Study of Compression related commands.
7) Study of Printer related commands.
8) Study of Communication commands.
9) Study of chmod and ls command.
10) Study of Vi editor.
11) Program to display your own information.
12) Program to perform arithmetic operation.
13) Program to perform for IF-ELSE Stmt.
14) Program for DO WHILE Loop.
15) Program for FOR loop.

Course Title: Lab Course (Java)
Course Code: U-LAC-593

Total Marks: 50   **Credits:2**

Learning Objective
Implement Object Oriented Programming Concepts .Use and create packages and interfaces in a Java program, implement multithreading. Learn how to build desktop application.

Course Outcomes
Implement Object Oriented Programming Concepts. Use and create packages and interfaces in a Java program .Create final year project with database connectivity.

- Implement Object Oriented Programming Concepts.
- Use and create packages and interfaces in a Java program.
- Implement collection framework classes.
- Create final year project with database connectivity.

Proposed Practical List:

1. Program to demonstrate simple java program
2. Program to demonstrate class and object
3. Program to demonstrate Static member function
4. Program to demonstrate method overloading
5. Program to demonstrate this and super keyword
6. Program to demonstrate method overriding.
7. Program to demonstrate use of String functions
8. Program to demonstrate creating and using packages
9. Program to demonstrate simple applet program
10. Program to demonstrate reading data from keyboard
11. Program to demonstrate HashTable and HashMap class
12. Program to demonstrate simple multithreading application
13. Program to demonstrate Inheritance using interface

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Course Title: Lab Course (DIP)
Course Code: U-LAC-594

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Total Marks: 50   **Credits: 2**

Learning Objectives
- To study image processing concepts
- To study mathematics and algorithms for image processing
- To study applications in image processing
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Course Outcome
- Describe fundamental steps used in digital image processing
- Understand applications of digital image processing
- Perform survey on image processing techniques
- Design and implement image processing programs with applying algorithms
- Solve Image Processing problems
- Describe different modalities and current techniques in image processing (overview)
- Describe how digital images are represented and stored efficiently depending on the desired quality, color depth
- Use the mathematical principles of digital image enhancement (contrast, noise)
- Describe and apply the concepts of filtering techniques
- Analyze the algorithms used in image processing to perform designated tasks using MATLAB
- Apply the knowledge primarily obtained by studying examples and cases in the field of biomedical imaging to other engineering disciplines

Proposed Practical List:
1. Study of MATLAB environment
2. Study of reading, writing and showing images
3. Study of image type conversions
4. Working on vectors and matrices
5. Study of M-file and control statements
6. Study of Histogram processing and equalization
7. Study of intensity transformation
8. Study of spatial filtering techniques
9. Study of Image restoration process
10. Write a program for color image processing

Course Title: Lab Course (Oracle 10G DBA)
Course Code: U-LAC-595

Total Marks: 50   **Credits: 2**

Learning Objectives

The purpose of database administration is to provide reliable, consistent, secure, and available corporate-wide data. This course provides detailed information about the roles performed by database administrator, distinguishes database administration and data administration, and describes several database operation and maintenance issues.

Course Outcomes

After successful completion of this course student will be able to:

-Maintain all aspects of a database and make sure that data is consistent in the database and clearly defined

-Work in a variety of industries as a DBA

-Ensure databases are secure and solves troubleshoot problems

-Monitor user access, determine user needs, design databases, perform tests and ensure standards

-Get important skills include technical, communication, analytical and problem-solving skills.

Proposed Practical List:

1. Study of Administrative Tools

2. Creating a Database and Database Startup

3. Generating the Production Database

4. Administering your Database

5. Administering the Control Files and Redo Logs

6. Managing Tablespaces and Data Files

7. Study of Storage Structures

8. Study of Tables, Indexes and Constraints

9. Study of Rollback Segments

10. Study of Managing Users

11. Study of Monitoring the Database

12. Study of Tuning the Database

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Course title: Mini Project
Course code: U-PRW-617

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Total Marks: 50   **Credits: 2**

Learning objectives

The student will be able to:

- Discover potential research areas in the field of IT
- Identify real world problems and challenges that need IT based solutions
- Demonstrate an ability to work in teams
- Improve the team building, communication and management skills of the students.
- Conduct a survey of several available literature in the preferred field of study
- Use all concepts of IT in creating a solution for a problem
- Formulate and propose a plan for creating a solution for the research plan identified
- Report and present the findings of the study conducted in the preferred domain

Course outcomes

After completing this course, the students will be able to have hands-on to carry out the Project Work using various platforms and project tools which will provide practical experience. Also,

- Implement what is learnt during course
- Get real-life experience by working in real systems
- Understand the problems faced during project implementation.
- Enhance the problem solving ability by solving the real-time problems.
- Learn team work and appreciate role of each of the team members.

Mini project Description:

• A team of maximum 3 students can be formed for this project and work together to learn working collaboratively.

• The team can choose the project area from the following:
  - Java based project
  - .Net based project
  - A project consisting analysis of an existing emerging technology based system
  - Network based project
  - Any other project based on IT field

• The team will be assigned an internal guide for the project, who will mentor the team during the project execution.

• The team has to take prior permission from the guide for any project that they have chosen.

• The team needs to report to the guide periodically and inform about the project progress. The timings for the reporting time will be informed at the beginning of the semester.

Mini project documentation format:

Acknowledgement

 Preface

Index:

1. Project definition
2. Objective and scope of the project
3. Existing system
    a. Introduction
    b. Problem analysis
        i. Study operating problems
        ii. Study informational problems
        iii. Feasibility study
    c. Present system model (Use any design tools / technique)
    d. What's new in the proposed system (if applicable)
4. Proposed system
    a. Functional requirements
    b. Non-functional requirements
    c. Project plan
5. Software requirement analysis and specification
    a. General description
    b. Specific functional and non-functional requirements
6. System design
    a. Proposed system model (Use any design tools / technique)

Development based projects:

7. Development
    a. Source code (for major processes)
 8. Implementation
    a. Implementation of the project
     b. Screenshots of the interface
     c. Post-implementation and software maintenance   OR

Analysis based projects:

9. Working outcomes of the existing system
 10. Working outcomes of the proposed system
    a. Predicted working outcomes of the proposed system
    b. Comparison of working of proposed system and existing system
11. Technical and managerial lessons learnt
12. Future enhancement
13. References

Semester-VI

<center>**Course Title: Principles of Compiler Design**
Course Code: U-PCD-687</center>

Total Marks: 50   **Credits: 2**

Learning Objectives
This course will enable a student to:
- Understand the major concept areas of language translation and compiler design
- Develop an awareness of functions and complexity of modern compilers
- Understand various phases of compiler

Course Outcomes
 On successful completion of the course the students will be able to:
- Understand the concrete view on the theoretical and practical aspects of compiler design
- Understand the compilation process
- Describe the notion of DFA's, NFA's, regular expressions and context free grammar
- Understand and Create lexical rules and grammars for a programming language
- Apply the knowledge primarily obtained by studying structure and context free grammar in the field of designing a compiler for a concise programming language

<center>**SYLLABUS**</center>

UNIT – I   Programming Languages and Compilers
Introduction to Compilers ,Compilers and translators, the structure of compiler, Compiler writing tools, High level programming languages, Definitions of programming languages, A lexical and syntactic structure of a language Data structures, Operators, Statements

UNIT – II   Lexical Analysis
Lexical analysis, Role of a Lexical analyzer, A simple approach to the design of lexical analyzer, Regular expressions, Finite automata, Minimizing number of states of a DFA, Implementation of a lexical analyzer

UNIT – III   Basic Parsing Techniques and Syntax Directed Translation
Context free grammars, Introduction to parsers, Shift reduce parsing, Top-down parsing, Operator Precedence parsing, Predictive parsers, Introduction Syntax Directed Translation, Syntax directed Schemes, Implementation of Syntax directed translators Intermediate code, Postfix notation and evaluation of postfix expressions, Parse trees and syntax trees

UNIT – IV   Symbol Tables, Errors and Code Optimization
 The contents of a symbol table, Data structures for a symbol table, Errors: Lexical-phase errors, Syntactic phase errors, Semantic errors, Introduction Code Optimization, Sources of optimization

Reference books

1. Principles of Compiler Design- By Alfred V. Aho, Jeffrey D. Ullman. Narosa Publishing House ISBN-81-85015-61-9

2. Compilers, Principles, Techniques and Tools - A.V. Aho, Ravi Sethi and J.D. Ullman. ISBN817-808-046-x

3. Introduction to system software By D. M. Dhamdhere

Course Title: Web Programming Using PHP
Course Code: U-WPU-688

Total Lectures: 50   **Total Marks: 50**
                                                           Credits: 2

Learning Objective :- Learn Designing of Web Pages, writing PHP code, JoinHTML with PHP, testing application on Browsers, object oriented programming with php, MySql connectivity etc.

Course Outcome:- Student should design Web Pages, Writing HTML page with PHP Code, run web page on various browsers, create php classes, works with different phpclasses, perform database connectivity with Mysql

Students can get job as a PHP Web developer or Web Designer

Syllabus

UNIT- I: PHP Basic

1. Introduction
HTTP basics, Introduction to Web server and Web browser, Introduction to PHP, advantages of PHP.

2. Programming Constructs
PHP syntax, Variables, Constants, Data types, Operators and Expressions, Conditional and Loop statement, Switch statement, Break and Continue.

UNIT- II: Function & Arrays

3. Function and String
Defining and calling a function, Default parameters, Variable parameters, Variable function, Types of strings in PHP, Printing functions, Encoding and escaping, Comparing strings, Manipulating and searching strings, Regular expressions.

4. Arrays and array function
Indexed Vs Associative arrays, Multidimensional arrays, Converting between arrays and variables, Traversing arrays, Using arrays, Functions: count, list, in array, current, next, previous, end, each, sort, rsort, assort, array_merge, array_reverse.

UNIT- III: OOPs and Forms

5. Introduction to Object Oriented Programming
Classes, Objects, Serialization, Inheritance, Interfaces, Encapsulation.

6. Working With Data
FORM element, INPUT elements, Validating user input, Passing variables between pages, Passing variables through a GET, Passing variables through a POST, Passing variables through a REQUEST, MVC Architecture.

UNIT- IV: State Management & MySQL

7. Cookies ad Sessions
Anatomy of a cookie, Setting a cookie with PHP, Deleting a cookie, Creating session cookie, Sessions: Starting a session, Working with session variables, Destroying a session, Encoding and Decoding session variables.

8. Introduction to MySQL
Introduction to MySql , Benefits of MySql, reserve words, keywords, variables, data types, Types of commands : Data Definition Commands, Data Manipulation Commands, Data Control Commands Clauses : where, order by, group by , having, like, between, Connectivity with PHP.

Reference Books:
1. Programming PHP Rasmus Lerdorf and Kevin Tatroe O'Reilly publication
2. Beginning PHP 5 Wrox publication
3. PHP and MYSQL O'Reilly publication

Web References:
1. www.php.net.in
2. www.W3schools.com
3. www.wrox.com

Total Lectures: 50   **Total Marks: 50**
                                                               Credits: 2

Learning Objectives:
- Understand computer graphics concepts
- Be able to explain co-ordinate systems and different types of printers
- Be able to explain line drawing and clipping algorithms
- Be able to create the graphics programs
- Be able to explain 2D and 3D transformations

Course Outcomes:
- Critical understanding of the theory of 2D and 3D transformations, projection and viewing
- Ability to create graphics designs
- Detailed knowledge of the graphics devices
- Detailed knowledge clipping and windowing algorithms.
- Ability to understand, design and implement scene graphs
- Practical skills in graphics programming including scene graph

Syllabus

Unit I: Overview of Computer Graphics and Line Drawing Algorithm

1. Introduction to Computer Graphics
Introduction
Advantages of computer graphics
Applications of computer graphics
Co-ordinate system: Cartesian and Polar
Display devices: Cathode Ray Tubes, Color CRT monitors
Direct View Storage Tube, Plotter, Light pen, Joystick

2. Raster Scan Graphics
Line segment and line drawing algorithm
Digital differential Algorithm
Bresenham's line algorithm

Unit – II : Transformations and segmented display file

3. Transformation
Two dimensional transformation
Matrix representation
Translation, Rotation, Scaling, Reflection, Shear

4. Segmented Display Files
Segment table, Functions for segmenting display file

Posting & unposting segments
Segment naming scheme
Default error conditions
Appending to segments

Unit – III: Clipping, Windowing and Display File

5. Clipping & Windowing
Viewing transformation
2-D clipping
End point codes
 Midpoint subdivision algorithm
Polygon clipping algorithm(Sutherland-Hodgman algorithm)
Windowing transformation

6. Display File Compilation
Refresh concurrent with reconstruction,
Free storage allocation,
Display file structure

Unit IV : Geometric Models and Simple graphics Package

7. Geometric Models.
Simple modeling example
Geometric modeling
Symbols & instances
Implementation of Instance transformation

8. Simple Graphics Package
Ground rules for graphics s/w design
Function domains
Graphics primitives
Windowing function
The transformation processor
The display code generator

Reference Books:
1. Principle of Interactive Computer Graphics -Willam Newman& Robert Sproull (TMH)
2. Prodedural Elements for Computer Graphics -David F. Rogers (TMH)
3. Computer graphics - A. P. Godse

Course Title: Advance Java
Course Code: U-ADJ-690

Total Lectures: 55   **Max. Marks: 50**
                                                                                         Credit: 2

Learning Objectives:
- Learn the basic concepts of Object-Orientation and how they are handled in Java
- Covers techniques for better class construction
- Understand Exceptions. How and when they should be handled
- An overview of database access and details for managing information using the JDBC API
- Examines the use of Object Serialization
- Learn how to use Servlet and JSP and XML with JSP
- Be able to create and use custom JSP tags
- A presentation of Enterprise JavaBeans and how to use it

Course Outcomes:
 After Completion of this course students are able to :
- Use the methods of the Applet and Component classes required for a basic applet
- Describe the classes in the AWT package that relate to the Applet class
- Describe the AWT graphics explain controls and how to apply them in the container
- Develop programs using Event class and Event Listener Interface
- Develop a program for steps to connect a database
- Describe the use of JDBC
- Develop program to use JDBC to query a database and modify
- Describe life cycle of servlet
- Develop program using javax.servlet package
- Explain JSP Architecture and its Life cycle

Syllabus

Unit I
1. Introduction to AWT: Working with windows, Graphics Text
1.1 AWT Classes
1.2 Windows Fundamentals
1.3 Working with Frame window
1.4 Working with Graphics
1.5 Working with Colors & Fonts

2. Swing Components
2.1 Icons & Labels Button & Label, TextField & Buttons,
2.2 CheckBoxes, Radio buttons
2.3 Combo Box & Lists
2.4 Scroll panes
2.5 Trees
2.6 Tables
2.7 Menu Bars & Menus

Unit-II
3. Networking
3.1 The java.net package
3.2 Connection oriented transmission – Stream Socket Class
3.3 Creating a Socket to a remote host on a port (creating TCP client and server)
3.4 Simple Socket Program Example
3.5 Programs on chatting 1-1

4. JDBC
4.1 The design of JDBC
4.2 Basic JDBC Concept
4.3 Drivers
4.4 Making the Connection, Statement
4.5 Executing SQL commands
4.6 Executing queries
4.7 Scrollable and updatable result sets
4.8 Metadata, transactions

Unit-III
5. Servlet
5.1 Introduction
5.2 Life cycle of servlet
5.3 Handling HTTP Get Request
5.4 Handling HTTP Post Request

6. Introduction to JSP
6.1 Getting Familiar with JSP Server
6.2 First JSP
6.3 Adding Dynamic contents via expressions
6.4 Scriptlets, Mixing Scriptlets and HTML
6.5 Directives, Declaration, Tags and Session

Unit-IV
7. Introduction to Java Beans & Hibernate
7.1 What is bean?
7.2 Advantages
7.3 The bean-writing process
7.4 Introduction to jar and manifest files
7.5 The java beans API
7.6 Overview Of hibernate
7.7 Hibernate Architecture

Reference Books:
1) Complete reference Java by Herbert Schildt(5th edition)
2) Java 2 programming black books, Steven Horlzner
3) Programming with Java , A primer ,Forth edition , By E. Balagurusamy
4) Java servlet Programming by Jason Hunter, O'Reilly
5) Core Java Volume-II-Fundamentals, Eighth Edition, Cay S. Horstmann, Gary Cornell,Prentice Hall, Sun Microsystems Press.

Total Lectures: 50   **Total Marks: 50**
                                                                                       Credits: 2

Course Objectives:
1. Build an understanding of the fundamental concepts of computer networking.
2. Familiarize the student with the basic taxonomy and terminology of the computer networking area.
3. Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
4. Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

Learning Outcomes:
After completing this course the student must demonstrate the knowledge and ability to:
1. Independently understand basic computer network technology.
2. Understand and explain Data Communications System and its components.
3. Identify the different types of network topologies and protocols.
4. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5. Identify the different types of network devices and their functions within a network
6. Understand and building the skills of subnetting and routing mechanisms.
7. Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation

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SYLLABUS

UNIT I
1. Introduction
- Internet & Internet services
- Ethernet technology
- Internetworking concepts and architectural model
- CIDR − Subnetting and super netting − ARP − IP −IP routing − ICMP −IPV6.

2. Internetworking Concepts & Architectural Model
- Application& Network layer interconnection
- Properties of Internet & Internet architecture
- Interconnection through I/P routers
- Internet addresses: Universal Identifier, Addressing scheme, network direct broadcast addresses & limited broadcast

UNIT II
3. ARP
- Address resolution problem
- Resolution through direct mapping & dynamic binding

- Address resolution cache: cache timeout, ARP refinements, ARP implementation, ARP protocol format
- ARP encapsulation & identification
- RARP

UNIT III
4. Internet protocol
- Virtual network
- Internet architecture & philosophy
- Purpose of internet protocol, IPV4
- Internet datagram options
- Direct & indirect delivery
- UDP

UNIT IV
5. Reliable stream transport service
- Properties
- Providing reliability
- Idea behind sliding window
- Transmission control protocol
- Ports, connections, endpoints
- TCP segment format
- DNS

Reference Books:
1. Internetworking with TCP/IP: Principles, protocols & architecture- By Douglos E. Comer (Pearson Education) (Volume 1. Fourth Edition)
2. Internetworking with TCP/IP: Principles, protocols & architecture- By Douglos E. Comer (Pearson Education) (Volume 1. Fifth Edition)
3. TCP/IP protocol suite- By Behrouz A. Forouzan (TATA-McGraw- Hill Education) (Third Edition)

Course Title: Lab Course (Compiler Design)
Course Code: U-LAC-692

Total Marks: 50	Credits: 2

Learning Objectives:
- To introduce the major concept areas of language translation and compiler design
- To develop an awareness of the function and complexity of modern compilers.
- To introduce various phases of compiler design.

Course Outcome:
After completion of this course, the student will be able to:
- Develop an understanding of the compilation process
- Describe the notion of DFA's, NFA's, regular expressions and context free grammar
- Understand and Create lexical rules and grammars for a programming language
- Practical applications of working of phases, regular expressions and context-free grammars.
- Apply the knowledge primarily obtained by studying structure and context free grammar in the field of designing a compiler for a concise programming language

Proposed Practical List:
1. Program to demonstrate operations on stack and queue data structure
2. Program to demonstrate lexical analysis phase
3. Program to demonstrate syntax phase
4. Program to demonstrate semantic analysis phase
5. Program to demonstrate intermediate code generation phase
6. Program to demonstrate code optimization phase
7. Program to demonstrate code generation phase
8. Program to demonstrate symbol table
9. Program to demonstrate error handler phase
10. Program to demonstrate semantic analysis phase

Course Title: Lab Course (PHP)
Course Code: U-LAC-693

Total Marks: 50   **Credits: 2**

Learning Objective :-
Learn Designing of Web Pages, writing PHP code, Join HTML with PHP, testing application on Browsers, object oriented programming with php, MySql connectivity etc.

Course Outcome:-
Student should design Web Pages, Write HTML page with PHP Code, run web page on various browsers, create php classes, works with different php classes and perform database connectivity with Mysql
Students can get job of PHP Web developer or Web Designer

Proposed Practical List:
1. HTML code to print Hello on Browser
2. HTML program with Form tag
3. HTML program with Form and Input tag
4. First PHP program
5. Php program for looping
6. Php program for Function
7. Php program for Printing Function
8. Php program for Encoding Function
9. Php program for Escaping Function
10. Php program for Inheritance
11. Php program for Interface
12. HTML &Php program for get and post method
13. Php program for Cookies
14. Php program for Session
15. Php program for Database connectivity with Mysql

Total Marks: 50   **Credits: 2**

Learning Objectives:
Understand computer graphics concepts
Be able to explain co-ordinate systems and different types of printers
Be able to explain line drawing and clipping algorithms
Be able to create the graphics programs
Be able to explain 2D and 3D transformations

Course Outcomes:
♦ Critical understanding of the theory of 2D and 3D transformations, projection and viewing
♦ Ability to create graphics designs
♦ Detailed knowledge of the graphics devices
♦ Detailed knowledge clipping and windowing algorithms.
♦ Ability to understand, design and implement scene graphs
♦ Practical skills in graphics programming including scene graph

Proposed Practical List:
1 Write a program to find the resolution of screen
2. Write a program to implement DDA
3. Write a program to implement Bresenham's integer algorithm
4. Write a program to implement Bresenham's general algorithm
5. Write a program to demonstrate translation
6. Write a program to demonstrate rotation
7. Write a program to demonstrate scaling
8. Write a program to demonstrate circle and rectangle, ellipse.
9. Write a program to demonstrate bar and 3dbar
10. Write a program to draw a national flag

Course Title: Lab Course (Advance Java)
Course Code: U-LAC-695

Total Marks: 50   **Credits: 2**

Learning Objectives:
- Learn the basic concepts of Object-Orientation and how they are handled in Java
- Covers techniques for better class construction
- Understand Exceptions. How and when they should be handled
- An overview of database access and details for managing information using the JDBC API
- Examines the use of Object Serialization
- Learn how to use Servlet and JSP and XML with JSP
- Be able to create and use custom JSP tags
- A presentation of Enterprise JavaBeans and how to use it

Course Outcome:
After Completion of this course students are able to :

- Write programs based upon java concepts.
- Create animation & events based upon advanced java concepts.
- Connect an application with database.
- Develop programs using java collection API as well as java Standard Library.
- Write, debug & document well structured java application

Proposed Practical List:

1. Write a program to demonstrate life cycle of applet and display Hello world on applet UI.

2. Write a program to create a frame window.

3. Write a program to make use various methods of graphics class object.

4. Write a program to display buttons, labels, and Image icons using swing.

5. Write a program to display check boxes and radio buttons using swing.

6. Write a program to display combo box and scroll pane using swing.

7. Write a program to display a tree using swing.

8. Write a program to display a table using swing.

9. Write a program to display Menu bar and menus using swing.

10. Write a program to demonstrate socket programming. E.g. send hello world to server from client.

11. Write a program to chat between client and server.

12. Write a program to connect to db and to execute the queries.

13. Write a Servlet code to demonstrate GET & POST methods.

14. Write a program to demonstrate JSP use.

Course Title: Major Project
Course Code: U-PRO-

Total Marks: 100   **Credits: 4**

Learning Objectives

The student will be able to:

- Discover potential research areas in the field of IT
- Identify real world problems and challenges that need IT based solutions
- Demonstrate an ability to work in teams
- Improve the team building, communication and management skills of the students.
- Conduct a survey of several available literature in the preferred field of study
- Use all concepts of IT in creating a solution for a problem
- Formulate and propose a plan for creating a solution for the research plan identified
- Report and present the findings of the study conducted in the preferred domain

Course Outcomes

After completing this course, the students will be able to have hands-on to carry out the Project Work using various platforms and project tools which will provide practical experience. Also,

- Implement what is learnt during course
- Get real-life experience by working in real systems
- Understand the problems faced during project implementation.
- Enhance the problem solving ability by solving the real-time problems.
- Learn team work and appreciate role of each of the team members.

Major Project Description:

• A team of maximum 3 students can be formed for this project and work together to learn working collaboratively.

• The team can choose the project area from the following:
  - Java based project
  - .Net based project
  - A project consisting analysis of an existing emerging technology based system
  - Network based project
  - Any other project based on IT field

• The team will be assigned an internal guide for the project, who will mentor the team during the project execution.

• The team has to take prior permission from the guide for any project that they have chosen.

• The team needs to report to the guide periodically and inform about the project progress. The timings for the reporting time will be informed at the beginning of the semester.

Major project documentation format:
Acknowledgement
 Preface
Index:
1. Project definition
2. Objective and scope of the project
3. Existing system
       a. Introduction
       b. Problem analysis
              i. Study operating problems
              ii. Study informational problems
              iii. Feasibility study
       c. Present system model (Use any design tools / technique)
       d. What's new in the proposed system (if applicable)
4. Proposed system
       a. Functional requirements
       b. Non-functional requirements
       c. Project plan
5. Software requirement analysis and specification
       a. General description
       b. Specific functional and non-functional requirements
6. System design
       a. Proposed system model (Use any design tools / technique)

Development based projects:
7. Development
       a. Source code (for major processes)
 8. Implementation
       a. Implementation of the project
        b. Screenshots of the interface
        c. Post-implementation and software maintenance   OR

Analysis based projects:
9. Working outcomes of the existing system
 10. Working outcomes of the proposed system
       a. Predicted working outcomes of the proposed system
       b. Comparison of working of proposed system and existing system
11. Technical and managerial lessons learnt
12. Future enhancement
13. References