

**Rajarshi Shahu Mahavidyalaya, Latur**  
(Autonomous)

**Department of Computer Science and Information Technology**  
**Syllabus for under graduation course (B.Sc.C.S.)**

(With Effect from Academic Year:2015-16)

**Name of the Programme: Bachelor of Computer Science (Third Year Semester V + VI)**

**Semester : V**

Code No	Course Name	Maximum Marks		Total Marks	Credits
		Theory / Practical	Internal		
U-APR-587	Aptitude and Reasoning	30	20	50	2
U-LOS-588	Linux Operating System	30	20	50	2
U-COJ-589	Core Java	30	20	50	2
U-DIP-590	Digital Image Processing	30	20	50	2
U-ORA-591	Oracle 10g DBA	30	20	50	2
U-LAC-592	Linux Operating System	50	-	50	2
U-LAC-593	Core Java	50	-	50	2
U-LAC-594	Digital Image Processing	50	-	50	2
U-LAC-595	Oracle 10g DBA	50	-	50	2
U-PRO-617	Mini Project	50	-	50	2
	Environmental Studies (NCBC)	50	-	50	2

**Semester : VI**

Code No	Course Name	Maximum Marks		Total Marks	Credits
		Theory / Practical	Internal		
U-PCD-687	Principals of Compiler Design	30	20	50	2
U-WPU-688	Web Programming using PhP	30	20	50	2
U-COG-689	Computer Graphics	30	20	50	2
U-ADJ-690	Advance Java	30	20	50	2
U-TCI-691	TCP/IP	30	20	50	2
U-LAC-692	Principals of Compiler Design	50	-	50	2
U-LAC-693	Web Programming using PhP	50	-	50	2
U-LAC-694	Computer Graphics	50	-	50	2
U-LAC-695	Advance Java	50	-	50	2
U-PRO-	Major Project	50	-	50	2

**Course Code: U-APR-587**  
**Course Name: Aptitude and Reasoning**

**Total Teaching Hours: 50**

**Total Marks: 50**

**Credit: 2**

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**Learning Objective**

- Tests of General or Global Ability (also called "g", intelligence, IQ)
- Tests of Specific Cognitive abilities (Abstract Reasoning, Verbal Reasoning, Numerical Reasoning)

**Course Outcomes**

- **Aptitude** and ability **tests** are designed to assess your logical reasoning or thinking performance. They consist of multiple choice questions and are administered under **exam** conditions. They are strictly timed and a typical **test** might allow 30 minutes for 30 or so questions.
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**Syllabus**

**UNIT - I**

**1. Quantitative Ability – 1 12Hrs**

- 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 12 Hrs**

- 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 8Hrs**

- 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 8Hrs**

- 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

**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.
  - Be familiar with various types of operating systems including Unix.
  - Student should be able to install the linux o.s.
  - He also should be able to execute the file, directory and general purpose related commands.
  - He also should be 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.
  - Student should execute the programs in vi - editor.
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**SYLLABUS**

**UNIT I: Introduction to LOS & File system & 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 & 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 EviNemeth, Garth Snyder, Scott Seebass, Trent R. Hein, “UNIX System Administration Handbook” Person Education Asia (LPE) (IIIrd Edition)
- 4 Red hat Linux & fedora unlashed Authors Bill Ball & Hoyt Dust.

### **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.
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## **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 Frame Work**

### **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>



**Course Title: Digital Image Processing**  
**Course code: U-DIP-590**

**Total Teaching Hours: 50**

**Total Marks: 50**  
**Credits:02**

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**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.
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**Syllabus**

**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 2-D 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

**Course Code: U-ORA 591**  
**Course Title: Oracle 10G DBA**

**Total Teaching Hours: 50**

**Total Marks: 50**  
**Credit 2**

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**Learning Objective:**

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

**Course Outcome:**

A Database Administrator is responsible for maintaining all aspects of a database. These professionals can be found working in a variety of industries. Database Administrators work to ensure databases are secure and that they are performing properly. They may also troubleshoot problems and work on development as well. They make sure that data is consistent in the database and that it is clearly defined. Depending on their level, Database Administrators may monitor user access, determine user needs, design databases, perform tests, ensure standards are maintained and work with other IT professionals and managers to ensure database integrity and security are kept up with. Important skills include technical, communication, analytical and problem-solving skills.

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**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 and Backup & Recovery**

**3 Physical Database Layouts & 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 and Backup, 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 & 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, database 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 administrators exam guide By SAM R Alapati

**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 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.
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**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.

## U-LAC-593

**Practical Total Marks: 50**

**CREDIT: [ PR-2]**

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### **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.
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### **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

## U-LAC-594

**Practical Total Marks: 50**

**CREDIT: [ PR-2]**

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### **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
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### **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

**Learning Objective:**

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

**Course Outcome:**

A Database Administrator is responsible for maintaining all aspects of a database. These professionals can be found working in a variety of industries. Database Administrators work to ensure databases are secure and that they are performing properly. They may also troubleshoot problems and work on development as well. They make sure that data is consistent in the database and that it is clearly defined. Depending on their level, Database Administrators may monitor user access, determine user needs, design databases, perform tests, ensure standards are maintained and work with other IT professionals and managers to ensure database integrity and security are kept up with. Important skills include technical, communication, analytical and problem-solving skills.

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**Proposed Practical List:**

1. Using Administrative Tools
2. Preparing to Create 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. Storage Structures
8. Tables, Indexes and Constraints
9. Rollback Segments
10. Managing Users
11. Monitoring the Database
12. Tuning the Database



**Course Title: Principles of Compiler Design**  
**Course code: U-PCD-687**

**Total Teaching Hours: 50**

**Total Marks: 50**

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**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:**

- Students will have a concrete view on the theoretical and practical aspects of compiler design
- Students will be able to apply ideas and techniques discussed to various software designing
- 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

**SYLLABUS**

**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. ISBN-817-808-046-x
3. Introduction to system software By D. M. Dhamdhere

**Course Code:U-WPU-688**

**Course Title:- Web Programming Using PHP**

**Teaching Hours : 60**

**Marks : 50**

**Total Credit:- 02**

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**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 of PHP Web developer or Web Designer

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## **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, asort, 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 & 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, key words, 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 RasmusLerdorf 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](http://www.php.net.in)
2. [www.W3schools.com](http://www.W3schools.com)
3. [www.wrox.com](http://www.wrox.com)

**Course Title: Computer Graphics**  
**Course Code:U-COG-689**

**Total Teaching Hours: 50**

**Total Marks: 50**

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**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
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**Syllabus**

**Unit I : Overview of computer graphics and line drawing algorithm**

**1 Introduction to ComputerGraphics**

Introduction  
Advantages of computer graphics  
application of computer graphics  
Co-ordinate system : Cartesian and Polar  
Display devices: Cathod 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 Code:U-ADJ-690**  
**Course Title:- Advance Java**

**Total Teaching Hours: 60**

**Max. Marks: 50**

**Total Credit:- 02**

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**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 :

- 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
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**Syllabus**

**Unit I**

**1.Introduction to AWT: Working with windows, Graphics Text**

- 1.1AWT Classes
- 1.2Windows Fundamentals
- 1.3Working with Frame window
- 1.4Working with Graphics
- 1.5Working 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.

**Course Objectives:** At the end of the course, the students will be able to:

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

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

**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:**

- Students will have a concrete view on the theoretical and practical aspects of compiler design
  - Students will be able to apply ideas and techniques discussed to various software designing
    - 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

## U-LAC-693

**Practical Total Marks: 50**

**CREDIT: [ PR-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 of PHP Web developer or Web Designer

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### **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

## U-LAC-694

**Practical Total Marks: 50**

**CREDIT: [ PR-2]**

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### **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

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### **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 3d bar

10. Write a program to draw a national flag

## U-LAC-695

**Practical Total Marks: 50**

**CREDIT: [ PR-2]**

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- Understand Exceptions. How and when they should be handled
- An overview of database access and details for managing information using the JDBC API
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- 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.