

Gujarat University
Choice Based Credit System (CBCS)
B. Sc. Semester - V (Computer Science)
Syllabus for Computer Theory & Practical
Academic Year 2013 -14

| Unit | Computer Theory | Computer Theory | Computer Theory | Computer Theory | Computer Elective Subject | Computer Practical |
|-------------|---------------------------------|--|---------------------------------------|------------------------|---|--|
| | COM - 301 | COM - 302 | COM - 303 | COM - 304 | COM - 305 | COM - 306 |
| | 4 Credit | 4 Credit | 4 Credit | 4 Credit | 2 Credit | 5 Credit |
| | Total 100 Marks | Total 100 Marks | Total 100 Marks | Total 100 Marks | Total 100 Marks | Total 200 Marks |
| | Internal 30 Marks | Internal 30 Marks | Internal 30 Marks | Internal 30 Marks | Internal 30 Marks | Group A : 100 |
| | External 70 Marks | External 70 Marks | External 70 Marks | External 70 Marks | External 70 Marks | Group B : 100 |
| | 4 hrs/Week | 4 hrs/Week | 4 hrs/Week | 4 hrs/Week | 3 hrs/Week | Internal 30 Marks |
| | | | | | | External 70 Marks |
| | | | | | | 12 hrs/Week |
| I | Introduction to S/w Engineering | Network Fundamentals | Introduction to JAVA | Introduction to PHP | Student has to select one subject elective course from below, Open Source Tools & Organization Structure & Behaviour | There are A,B Groups, A group Consist of 24 experiments, B group Consist of 22 experiments Total 46 experiments |
| II | Software development processes | OSI Model | Fundamentals of JAVA | Control Structure | | |
| III | Requirement & Specification | Hardware & Software | Class Structure in JAVA | PHP with OOPs | | |
| IV | S/w Designing | Security Issues, Concept & Terminology | Packages, Interfaces & Thread in JAVA | Introduction to MySQL | | |

Gujarat University
Choice Based Credit System (CBCS)
Syllabus for B. Sc. Semester - V (Computer Science)
COM 301: Software Engineering - I (Theory)

Hours: 4 /week

Credits: 4

1 Introduction to Software Engineering

1.1 Software

1.1.1 Software & Software Types

1.1.2 software characteristics & problems

1.1.3 Introduction to Software quality

1.2 Software Engineering & problem related to it

1.3 Software engineering approach

1.3.1 Introduction to phased development approach

1.3.2 Project management activities

1.3.3 Introduction to effort distribution

2 Software Development Processes

2.1 Relationship between Processes, Projects and Products

2.2 Software process models

2.2.1 Linear sequential/ waterfall model

2.2.2 Prototype model

2.2.3 RAD model

2.2.4 Incremental model

2.1.5 Spiral model

3 Software Requirement analysis & specification

3.1 Introduction to requirement analysis & specification

3.1.1 Need for analysis

3.1.2 Activities, roles & responsibilities

3.2 Software requirements- Characteristics & issues

3.3 Requirement gathering formal & informal techniques

3.3.1 Interviews

3.3.2 Questionnaires

3.3.3 System walk through

3.3.4 Document survey

3.3.5 Introduction to FAST , QFD & JAD

3.4 Requirement modeling

3.4.1 Elements of analysis models

3.4.2 Structured modeling – data modeling, functional modeling, functional modeling ,structure behavior , data, attribute, relationship, cardinality &ERD

3.4.3 Functional modeling – DFD & process specification

3.4.4 Introduction to behavioral modeling

- 3.4.5 Data Dictionary
 - 3.5 Software Requirement Specification
 - 3.5.1 Structure & Component of SRS
 - 3.5.2 Characteristics of SRS
 - 3.6 Introduction to Requirement validation
- 4 Software Designing**
- 4.1 Introduction to Design
 - 4.1.1 Importance of design
 - 4.1.2 Relationship between analysis & design
 - 4.1.3 Design Principals
 - 4.2 Design Concepts
 - 4.2.1 System level design concepts – Abstraction, Refinement , Modularity, Structural Partitioning & Structured Charts
 - 4.2.2 Module level design concepts – Coupling , Cohesion

REFERENCE

1. Software Engineering: A Practitioner’s Approach, 4e/5e, Roger S. Pressmann, McGrawHill Publication
2. Integrated Approach to Software Engineering, Pankaj Jalote, Narosa Publication.
3. Software Testing , Ron Patton, SAMS-Techmedia Publication
4. Practical Project Management, Ivan Bayross, Firewall Media.
5. Microsoft Office Project 2003 Bible, Elanic Marmel, Wiley Publishing
6. Software Engineering, K. K. Aggrawal, Yogesh Singh, New Age International Publishers.
7. Fundamentals of Software Engineering, carlo Ghezzi, Mehdi Jazayeri, Dino Mendrilo, PHI.
8. Software Engineering, Ian Summerville, Addison Wesley-Pearson Education.
9. Software Engineering, K. L. James, PHI

GUJARAT UNIVERSITY, AHMEDABAD
Choice Based Credit System (CBCS)
Syllabus for B.Sc. Semester – V (Computer Science)
COM - 302 : COMPUTER NETWORKS (Theory)

Hours : 4 / week

Credits : 4

1. Network Fundamentals:

- 1.1** Introduction to Networks, Network topologies and types of networks.
 - 1.1.1. What is networking?
 - 1.1.2. Exchange, sharing, preserving and protecting information, Need, Uses and advantages of Network.
 - 1.1.3. Network in work places(Personnel and Tasks)
 - 1.1.4. Network topologies (Bus, Star, Ring, Star Bus, Star Ring, Mesh)
 - 1.1.5. Transmission media (Wires, Types of Cables)

2. OSI Model

- 2.1 Introduction to OSI Model
- 2.2 OSI Model Lower layer function (Physical and Data Link Layers), OSI Model Middle Layer Function (network and transport Layers), OSI Model Upper Layer Function (Session, Presentation and Application Layers)
- 2.3 IEEE 802 Standards :- 802.3,802.4,802.5.
- 2.4 TCP/IP Protocol suites, Types of protocol – IP,TCP, UDP, DHCP, DNS.

3. Network hardware and Software

- 3.1 Network Cards and Cables, Repeaters, Hubs, Routers and Bridges.
 - 3.1.1. Network cards, repeaters – its use and selection criteria.
 - 3.1.2. Splitting up networks
 - 3.1.3. Bridges – Use and working of bridges
 - 3.1.4. Switches - Use and full duplex operation & modes of switches.
 - 3.1.5. Routers – Use and working of Routers.
- 3.2 Network Operating Systems
 - 3.2.1. Peer Network operating system (windows-XP) – Networking features of Window-XP.
 - 3.2.2. Client-Server Operating System – Their common features.

4. Network Security Issues, concept and terminology

- 4.1 Definition of various types of security & need of security.
- 4.2 Security Attacks.

List of Reference Books:

- 1) Networking Complete, BPB Publication
- 2) Mastering Local Area networks, Christa Anderson & Mark Minasi, BPB Publication
- 3) Computer Networks, Tenenbaum, PHI, New Delhi

Gujarat University
Choice Based Credit System (CBCS)
Syllabus for B. Sc. Semester - V (Computer Science)
COM 303 : JAVA Programming - I (Theory)

Hours: 4 /week

Credits: 4

1. Introduction to Java

- 1.1 History of java
- 1.2 Versions of Java
- 1.3 Different programming environments for Java
- 1.4 Java Documentation

2. Fundamentals of Java

- 2.1 Java keywords and symbols
- 2.2 Constants and Identifiers
- 2.3 Data types in Java
- 2.4 Comments in java
- 2.5 Java Operators
- 2.6 Conditional statements
- 2.7 Control Structures in Java

3. Class Structures in Java

- 3.1 class structure in Java
- 3.2 Inheritance
- 3.3 Polymorphism
- 3.4 this and super
- 3.5 Data Hiding and Encapsulation
- 3.6 memory management in Java
- 3.7 Garbage collection

4. Java Packages and Interfaces and Threads in Java

- 4.1 Concepts of Package
- 4.2 Defining package
- 4.3 Importing class and package
- 5.1 Concepts of Interface
- 5.2 Defining Interface
- 5.3 Implementing Interface
- 5.4 Implementing multiple interfaces
- 5.5 Extending Interface
- 5.6 Concepts of Abstract class
- 5.7 Concepts of Thread
- 5.8 Thread life cycle
- 5.9 Creating and extending Thread
- 5.10 Thread priorities

List of Reference Books:

- 1) The Complete Reference Java2, Herbert Schildt, TMH, New Delhi
- 2) Mastering JAVA2, John Zukowski, BPB
- 3) Teach Yourself Java2 platform in 21 days, Lamey & Cadenhead, Teach Media
- 4) Java in Nut shell, O'Relly Publication
- 5) Java Language Reference, O'Relly Publication
- 6) www.sun.com
- 7) www.tomcat.apache.org

Gujarat University, Ahmadabad
Choice Based Credit System (CBCS)
Syllabus for B.Sc. Semester – V(Computer science)
COM 304 : Introduction to PHP & MYSQL

Hours : 4 / Weeks

Credit : 4

1. Introduction to PHP

- 1.1 Installation of PHP
- 1.2 PHP configuration in IIS & Apache Web Server and features of PHP
- 1.3 Understanding WAMP
- 1.4. How PHP code is parsed
- 1.5. Embedding PHP and HTML
- 1.6. Executing PHP and viewing in Browser
- 1.7. Data types
- 1.8. Operators
- 1.9. PHP variables: static and global variables and Comments in PHP.

2. Control Structures

- 2.1. Condition statements
 - 3.1.1. If...Else
 - 3.1.2. Switch
 - 3.1.3. ? Operator
- 2.2. Loops
 - 3.2.1. While
 - 3.2.2. Break Statement
 - 3.2.3. Continue
 - 3.2.4. Do...While
 - 3.2.5. For
 - 3.2.6. For each
- 2.3. Exit, Die, Return
- 2.4. Arrays in PHP
- 2.5. FORM element, INPUT elements
- 2.6. Validating the user input
- 2.7. Passing variables between pages
 - 2.7.1. Passing variables through a GET
 - 2.7.2. Passing variables through a POST
 - 2.7.3. Passing variables through a REQUEST

3. PHP with Oops (object oriented programming)

- 3.1 Object oriented concepts
 - 3.1.1 Understanding Object
 - 3.1.2 Define a class
 - 3.1.3 Class attributes
- 3.2 Creating an object

- 3.3 Object constructors & destructors
- 3.4 Class constants
- 3.5 Static method
- 3.6 Class inheritance
- 3.7 Abstract classes
- 3.8 Final keyword
- 3.9 Implementing Interface
- 3.10 Object serialization

4. Functions and Handling sessions and cookies

- 4.1. Built-in functions
 - 4.1.1. String Functions: chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, substr, strcmp, strcasecmp, strpos, strrpos, strstr, strpos, str_replace, strrev, echo, print
 - 4.1.2. Math Functions: abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand
 - 4.1.3. Date Functions: Date, getdate, setdate, Checkdate, time, mktime
 - 4.1.4. Array Functions: count, list, in_array, current, next, previous, end, each, sort, rsort, asort, array_merge, array_reverse
 - 4.1.5. File Handling Functions: fopen, fread, fwrite, fclose, file_exists, is_readable, is_writable, fgets, file, file_get_contents, file_put_contents, ftell, fseek, rewind, copy, unlink, rename
 - 4.1.6. Miscellaneous Functions: define, constant, include, require, header, die
- 4.2. User Defined Functions
- 4.3. Concept of Session
- 4.4. Starting session
- 4.5. Modifying session variables
- 4.6. Unregistering and deleting session variable
- 4.7. Concept of Cookies
- 4.8. Handling of Cookies
- 4.9. How to upload files

5. Introduction of mySql

- 5.1. Installation of MySql
- 5.2. Types of tables in mySql
- 5.3. Query in mySql: select, insert, update, delete
- 5.4. Truncate
- 5.5. Alias
- 5.6. Order by
- 5.7. Backup and Restore
- 5.8. Database connectivity of PHP with mySql

Reference Books:

1. The complete Reference PHY by Stever Holzner : McGraw Hill
2. PHP 5.0 and MySql Bible Tim Converse, Joyce Park, Clark Morgan, Publishers: John Wiley & Sons
3. MySql Bible by Steve Suehring Publisher: John Wiley & Sons
4. PHP Black Book by Peter Moulding
5. Beginning PHP 5.3 by Matt Doyle - By Wrox Publication
6. MySql Bible by Steve Suehring Publisher: John Wiley & Sons

Gujarat University
Choice Based Credit System (CBCS)
Syllabus for B. Sc. Semester - V (Computer Science)
COM 306 : Practicals (Based on Java Programming – I And PHP)

Hours: 12 /week

Credits: 5

| | |
|------------------------------|------------|
| Total Practical Marks | 200 |
| Java programming - I | 100 |
| PHP | 100 |

JAVA Practical List

1. Write a Java Program to find the Area of circle.
2. Write a Java Program to find the result of following expression
(Assume a=10,b=5)
 - a) $(a < 2) + (b > 2)$
 - b) $(a) \parallel (b > 0)$
 - c) $(a + b * 100) / 10$
 - d) $a \& b$
3. Write a Java Program that will display Factorial of the given number.
4. Write a Java Program that will display the sum of $1 + 1/2 + 1/3 + \dots + 1/n$.
5. Write a Java Program that will display 25 Prime nos.
6. Write a Java Program to compute the sum of the digits of a given integer. Remember, your integer should not be less than the five digits.(e.g.,if input is 23451 then sum of the digits of 23451 will be 15)
7. Write a Java Program that will accept command-line arguments and display the same.
8. Write a Java Program to explain the use of break and Continue statements.
9. Write a Java Program to sort the elements of an array in ascending order.
10. Write a Java Program to find $A * B$ where A is a matrix of $3 * 3$ and B is a matrix of $3 * 4$. Take the values in matrixes A and B from the user.
11. Write a Java Program with class Rectangle with the data fields width,length,area and color.The length,width and area are of double type and color is of string type.The methods are set_length(),set_width(),set_colour(),and find_area().Create two object of Rectangle and compare their area and colour.If area and color both are the same for the objects then display “Matching Rectangles”,otherwise display “Non matching Rectangle” .
12. Create a class Account with two overloaded constructors.The first constructor is used for initializing,the name of account holder,the account number and the initial amount in the

account. The second constructor is used for Initializing the name of the account holder, the account number, the addresses, the type of account and the current balance. The Account class is having methods Deposit(), Withdraw(), and Get_Balance(). Make the necessary assumption for data members and return types of the methods. Create objects of Account class and use them.

13. Write a Java Program to show that private member of a super class cannot be accessed from derived classes.
14. Write a Java Program to create a Player class. Inherit the classes Cricket_Player, Football_Player and Hockey_Player from Player class.
15. Write a class Worker and derive classes Daily Worker and Salaried Worker from it. Every worker has a name and salary rate. Write method Compay(int hours) to compute the week pay of every worker. A Daily Worker is paid on the basis of the number of days s/he works. The Salaried Worker gets paid the wage for 40 hours a week no matter what the actual hours are. Test this program to calculate the pay of workers. you are expected to use the concept of polymorphism to write this program.
16. Write a Java Program to show the usefulness of Interfaces as a place to keep constant value of the program.
17. Create an Interface having two methods division and modules. Create a class, which overrides these methods.
18. Write a Java Program which implements interface students which has two methods Display_Grade and Atrendance for PG_Students and UG_Students (PG_Students and UG_students are two different classes for Post Graduate and Under Graduate students respectively).
19. Write a program to make a package Balance in which has Account class with Display_Balance method in it. Import Balance package in another program to access Display_Balance method of Account class.
20. Write a Java Program to enable the user to handle any chance of divide by zero exception.
21. Write a Java Program to display the names and roll numbers of students. Initialize respective array variables for 10 students. Handle Array IndexOutOfBoundsException, so that any such problem doesn't cause illegal termination of program.
22. Create an exception class, which throws an exception if operand is non-numeric in calculating modules. (use command line arguments).
23. Write a program to launch 10 threads. Each thread increments a counter variable. Run the program with synchronization.
24. Write a program for generating 2 threads, one for printing even numbers and the other for print odd number .

PHP Practical List

1. Write JavaScript code for print Hello Computer message
2. Write a JavaScript code for Client side validation.
3. Write a PHP program for print "Hello World"
4. Write a PHP program which is define different variable
5. Write a PHP program which work on the global Keyword
6. Write a PHP program using 'get method'
7. Write a PHP program for print variable value into text box.
8. Write a PHP program for check given number is positive or negative or zero
9. Write a PHP program which is execute SWITCH statement
10. Write a PHP program which is execute while and do. while loop
11. Write a PHP program which excite with the for loop
12. Write a PHP program for take array variable and enter the value
13. Write a PHP program for crate a user define function.
14. Write a PHP program which is define different variable function
15. Write a PHP program for set session.
16. Write a PHP program for connection with my sql
17. Write a PHP program for add record into database
18. Write a PHP program for search record from the database
19. Write a PHP program for delete , update record from the database
20. Write a PHP program for display all record from the database
21. Write a PHP program for create CSS file
22. Write a PHP program for the user the CSS file.

**STUDENTS ARE SUPPOSED TO SELECT ONE
PAPER FROM THE GENERUIC ELECTIVE
SUBJECTS**

Gujarat University
Choice Based Credit System (CBCS)
Syllabus for B. Sc. Semester - V (Computer Science)
COM 305 : GENERIC ELECTIVE-I

Hours: 2 /week

Credits: 2

SUBJECT : Open Source Tools

1.Introduction to Open Source

- 1.1 .Open Source: Meaning, Need, History and Principles
- 1.2. Success of Open Source
- 1.3 .Free Software and Open Source Software
- 1.4. FOSS
- 1.5. Open Source Initiative and Open Source Standards
- 1.6. Software Freedom and Open Source Software Development

2.Open Source Projects

- 2.1. Open Source Project Development Process
- 2.2. Open Source Project Maintenance
- 2.3. Open Source Hardware
- 2.4. Open Source Design
- 2.5. Open Source Teaching Platform
- 2.6. Case Study of Linux Project

3.Ethics and Economies of Open Source

- 3.1. Open Source and Closed Source Software
- 3.2. Open Source Government
- 3.3. Ethics of Open Source and Social Impact, Share Software and Resources
- 3.4. Shared Software and Shared Sources

4.GIMP Basics

- 4.1. GIMP Basics, GIMP Windows and Dialogs: Toolbox, Image Window, Layers, Channels, Paths Dialogs, The Dialogs for Color, Brushes, Patterns, Gradients, and Palettes
- 4.2. Loading, Saving and Creating New Images, RGB, Grayscale, and Indexed Images
- 4.3. Layers and the Role: Layers Dialog and Layers Menu, Channels and their Relationship to Layers,Channels Dialog
- 4.4. Conversions of Selections, Channel Masks, Layer Masks, and Alpha Channels, Masks and Selection

References Books:

1. Kailash Vadera & Bhavyesh Gandhi, Open Source Technology, University Science Press, Laxmi Publications
2. Carey Bunks, Grokking the GIMP, New Riders Publishing., <http://gimp-savvy.com/BOOK/index.html>
3. Fadi Greek & James Hugh, Open Source Technology and Policy, Cambridge University Press.
- 4 .Dan Woods, Gautam Guliani, Open Source for the enterprise, O'Reilly.
5. <http://www.gimp.org/tutorials/>

Gujarat University
Choice Based Credit System (CBCS)
Syllabus for B. Sc. Semester - V (Computer Science)
COM 312 : GENERIC ELECTIVE-I

Hours: 2 /week

Credits: 2

Subject: ORGANIZATION STRUCTURE & BEHAVIOUR

1. Introduction to Organization

- 1.1. Structure of organization
- 1.2. What is Management
- 1.3. Scope of Management
- 1.4. organization function and information needs

2. Need for Management

- 2.1. Role of Management
- 2.2. Manager's Role (Interpersonal Role, Information Role and Decisional Role)
- 2.3. Managerial Skills (Technical Skills, Human Skills, Conceptual Skills)

3. Attitude

- 3.1. Meaning of Attitudes
- 3.2. Characteristics of Attitudes

4. Motivation

- 4.1. What is motivation?
- 4.2. Nature and Characteristics of Motivation
- 4.3. Importance & Benefits of Motivation

5. Leadership

- 5.1. What is Leadership?
- 5.2. Characteristics of Leadership
- 5.3. Leadership Styles
- 5.4. Leadership Skills (Technical Skills, Human Skills, Conceptual Skills. Personal Skills)

6. Decision Support System

- 6.1. introduction to DSS
- 6.2. Decision Making in DSS
- 6.3. Classification of DSS
- 6.4. Group Decision Support Systems

Reference Books:

1. Management & Organization Development – By Ahmed Abod Rachna Prakashan, New Delhi
2. Organization Behaviour – By Aplewhite Philip, Prentice hall
3. Management & Organization Development – By Argyris Chris, McGraw Hill
4. Human Behaviour at work – By Davis Keeth, Tata McGraw Hill
5. Organization Behaviour – By L.M. Prasad.

