

Gujarat University
Choice Based Credit System (CBCS)
B. Sc. Semester - V (Computer Science)
Syllabus for Computer Theory & Practical
Academic Year 2018 -19

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, MIS(Management Information System) & E-Commerce	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 Fiber Optic Communication

- 3.2.1 Introduction, Optical Source, Propagation in Fiber, Light detection
- 3.2.2 Fiber Distributed Data Interface, Advantages of Fiber Optic cables, Fiber Optic Cables

4. Data Communication System

- 4.1 Introduction, Facsimile(FAX), Satellite Communication, Multiple Access Techniques,
- 4.2 HUB & VSAT Techniques, Digital Exchange

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

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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 Introduction to PHP
- 1.2 Features of PHP
- 1.3. Embedding PHP and HTML
- 1.4. Data types
- 1.5. Operators
- 1.6. PHP variables: static and global variables and Comments in PHP.
- 1.7 Control Statements,Loops,Arrays in PHP,
- 1.8 Passing Variable between pages (Using GET, POST, REQUEST)

2. PHP with Oops (object oriented programming)

- 2.1 Object oriented concepts
 - 2.1.1 Understanding Object
 - 2.1.2 Define a class
 - 2.1.3 Class attributes
- 2.2 Creating an object
- 2.3 Object constructors & destructors
- 2.4 Class constants
- 2.5 Static method
- 2.6 Class inheritance
- 2.7 Abstract classes
- 2.8 Final keyword
- 2.9 Implementing Interface
- 2.10 Object serialization

3. Functions and Handling sessions and cookies

3.1. Built-in functions

- 3.1.1. String Functions: chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, substr, strcmp, strcasecmp, strpos, strrpos, strstr, stristr, str_replace, strrev, echo, print
- 3.1.2. Math Functions: abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand
- 3.1.3. Date Functions: Date, getdate, setdate, Checkdate, time, mktime
- 3.1.4. Array Functions: count, list, in_array, current, next, previous, end, each, sort, rsort, assort, array_merge, array_reverse

3.1.5. 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

3.1.6. Miscellaneous Functions: define, constant, include, require, header, die

3.2. User Defined Functions

3.3. Concept of Session

3.4. Starting session

3.5. Modifying session variables

3.6. Unregistering and deleting session variable

3.7. Concept of Cookies

3.8. Handling of Cookies

3.9. How to upload files

3.10 Validation of user input using PHP

4. Introduction of mySql

4.1. Installation of MySql

4.2. Types of tables in mySql

4.3. Query in mySql: select, insert, update, delete

4.4. Truncate

4.5. Alias

4.6. Order by

4.7. Backup and Restore

4.8. Database connectivity of PHP with mySql

5. Introduction of CMS

5.1. Introduction of CMS

5.2. Features of CMS

5.3. Types of CMS (WordPress, Joomla)

Reference Books:

1. The complete Reference PHP 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

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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 Attendance 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 using alert box.
2. Write a JavaScript code for Client side validation.
3. Write a program to check valid login id and password using html and JavaScript.
4. Write a PHP program to create calculator using user defined functions.
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 have usage of string built-in functions
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 to generate multiplication of matrix
13. Write a PHP program for crate a user define function.
14. Write a PHP program using file handling built-in functions.
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 program to create CSS and implement with PHP form using include function

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: MIS (Management Information System)

1. Introduction to MIS

- 1.1 Introduction to Management Information Systems
- 1.2 History of MIS
- 1.3 .Impact of MIS
- 1.4. Role and Importance
- 1.5. Hardware support for MIS

2. Conceptual Foundations

- 2.1 Categories Of MIS
- 2.2The Decision Making Process
- 2.3 System Approach to Problem Solving,
- 2.4The Structure of Management Information System

3. Kinds of Information Systems:

- 3.1Types of Management Systems
- 3.2Concepts of Management Organization
- 3.3Differences between planning and control information
- 3.4 Systems Analysis, Systems Design

4.MIS Planning and development

- 4.1Business Process Re – Engineering,
- 4.2Improving a process in BPR,
- 4.3 Object Oriented methodology
- 4.4BPR – Current Focus

References Books:

Rhodes-Ousley, Mark. *Information Security: The Complete Reference, Second Edition, . Information Se*

Management: Concepts and Practice. New York, McGraw-Hill, 2013.

- Whitman, Michael E. and Herbert J. Mattord. *Roadmap to Information Security for IT and Infosec Managers*. Boston, MA: Course Technology, 2011.

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Syllabus for B. Sc. Semester - V (Computer Science)
COM 305: GENERIC ELECTIVE-I

Hours: 2 /week

Credits: 2

Subject: E-Commerce

1. Intranet and Extranet

Architecture of Internet, Intranet, Extranet
Characteristics of internet, Intranet and extranet
Application of Intranet
Application of extranet

2. Introduction To E-Commerce

Definition, communication perspective, business process perspective, service perspective
Classification by nature of transaction : B2B, B2C, C2C, C2B, Non business EC, Intra-business
EC Classification of EC Applications: electronic market, inter organizational system, customer
services Benefits to organizations, consumers, and society Limitations of EC, framework of EC,
future of EC

3. E-Commerce Business Models and Electronic Marketplaces

Introduction, eight key ingredients of a business model, major B2C and B2B business models,
Introduction to M-Commerce.
Marketspace components, types of electronic markets (electronic storefronts, electronic malls,
types of stores and malls)
Portals and their types, role of intermediaries in E-markets, E-market success factors,
competitive factors, impact of E-Market on organizations (marketing, HR, manufacturing,
finance and accounting)

4. Customer Relationship Management (CRM) and Electronics Payment system

CRM : meaning, types of CRM, benefits and limitations of CRM, issues in
CRM implementation, classifications of CRM applications, one-to-one marketing
(personalization, collaborative filtering, customer loyalty, trust)
Security schemes Electronic credit card system on Internet
Electronic fund Transfer and Debit card on internet
Smart card system

Reference Books:

Electronic Commerce : A managerial Perspective Efraim Turban, Jae Lee, David King, H Michael Chung (Pearson Education.)

E-Commerce – Business, Technology, Society Kenneth C Laudon, Carol Guercio Traver (Pearson Education)