

College of Computer, Science & Information Technology - Junagadh

AFFILIATED TO BHAKTA KAVI NARSINH MEHTA UNIVERSITY



◆ Syllabus ◆

B.Sc.(IT) [Bachelor of Science in Information Technology]

B.C.A. [Bachelor of Computer Application]
[Semester – III & IV]

Academic Year : 2020 – 21

(Effective from June – 2019)



◀ ADDRESS : C.C.S.I.T. - JUNAGADH ▶

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(SEMESTER-III)

Subject code	Subject Name	Credit	Int. Marks	Ext. Marks	Total Marks
CS-13	C++ and Object Oriented Programming	5	30	70	100
CS-14	CMS With WordPress & Magento	5	30	70	100
CS-15	Network Technology & Administration With SEO	5	30	70	100
CS-16	RDBMS Using Oracle (10 G)	5	30	70	100
CS-17	Practical - 1 (Based On CS - 13, CS - 16)	5	-	-	100
CS-18	Practical - 2 (Based On CS - 14, CS - 15)	5	-	-	100
Total Credits		30	Total Marks		600

(SEMESTER-IV)

Subject code	Subject Name	Credit	Int. Marks	Ext. Marks	Total Marks
CS-19	Programming with JAVA	5	30	70	100
CS-20	Programming with C#	5	30	70	100
CS-21	SAD, Software Quality Assurance and Testing	5	30	70	100
CS-22	Operating Systems Concepts with Unix / Linux	5	30	70	100
CS-23	Practical - 1 (Based on CS-19)	5	-	-	100
CS-24	Practical - 2 (Based on CS-20 & CS-22)	5	-	-	100
Total Credits		30	Total Marks		600

Structure of Theory Examination Paper – External

Question Paper contains 5 Questions (each of 14 marks). Every Question is divided in four parts like (a), (b), (c) and (d). Every Question will be asked from corresponding unit as specified in the syllabus of each course. (i.e. Question-1 is from Unit No. 1 and remaining questions from their corresponding Units).

TOTAL MARKS : 70, TOTAL TIME : 2½ HOURS

General Instructions:

1. Time duration of each theory paper will be of Two and Half hours.
2. Total marks of each theory paper will be 70 marks.
3. There will be five questions.
4. All questions are compulsory.

Instructions to the candidates for Practical Examination:-

1. Practical Exam. would be conducted for 1 ½ days, All the students have to remain present at the examination center 15 minutes before the scheduled time for examination.
2. Students have to carry with them certified Journal, I - card, Examination Receipt, and other necessary requirements for examination.
3. Student should not leave the laboratory without the permission of examiner.
4. Use of calculator is allowed but the use of mobile phones is strictly prohibited.
5. The candidate has to leave the laboratory only after the submission of all the answer sheets of the exercises performed.

B.Sc.(IT) & B.C.A. SEMESTER – III

CS-13 : C++ and Object Oriented Programming

Unit-1 : Principles of Object – Oriented Programming Tokens, Expressions & Control Statements

Procedure – Oriented Programming

- Object oriented programming paradigm
- Basic concepts of object-oriented Programming
- Benefits of object-oriented programming
- What is c++?
- Input/output operators
- Structure of c++ program
- Introduction of namespace
- Create own header file
- Tokens :
Keywords, identifiers, basic data types, user- defined types, derived data types, declaration of variables, dynamic initialization of variables, reference variables
- Operators in C++ :
Scope resolution operator, member referencing operator, memory management operator, manipulators, and type cast operator.
- Expression :
Expression and their types, special assignment operator, implicit conversions
- Control structures
Conditional control structure:
Simple if, if...else, nested if else, switch etc.
Looping control structure:
for, while, do...while

Functions in C++

- The main function
- Function prototype
- Call by reference
- Return by reference
- Inline function
- Default arguments
- Functions overloading
- Adding C Functions turbo C++

Unit-2 : Classes and Objects, Constructor & Destructor

C structures revisited

- Specifying a class
- Local Classes
- Nested Classes
- Defining member functions, nesting of Member functions, private member function, making outside function inline
- Arrays within a class
- Memory allocation for objects
- Static data member
- Arrays of objects
- Objects as function arguments
- Friendly functions
- Returning objects
- Characteristics of constructor

- Explicit constructor
- Parameterized constructor
- Multiple constructor in a class
- Constructor with default argument
- Copy constructor
- Dynamic initialization of objects
- Dynamic constructor
- Destructors

Unit-3 : Operator Overloading & Type Conversion, Inheritance

- Concept of operator overloading
- Over loading unary and binary operators
- Overloading of operators using friend Function
- Manipulation of string using operators
- Rules for operator overloading
- Type conversions.
- Comparison of different method of conversion
- Defining derived classes
- Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid)
- Virtual base class
- Constructors in derived class
- Containership, Inheritance V/s Containership

Unit-4 : Pointer, Virtual functions & Polymorphism, RTTI Console I/O Operations

- Pointer to Object
- Pointer to derived class
- this pointer
- Rules for virtual function
- Virtual function and pure virtual function.
- Default argument to virtual function
- Run Time Type Identification
- C++ streams
- C++ stream classes
- Unformatted and formatted I/O operations
- Use of manipulators.

Unit-5 : Working with Files, Exception handling, Introduction to Template STL

- File stream classes
- Opening and closing a file
- File modes
- File pointers
- Sequential I/O operations
- Updating a file (Random access)
- Command line arguments
- Overview of Exception Handling
- Need for Exception Handling
- various components of exception handling
- Introduction to templates
- Class templates
- Function templates
- Member function templates

- Overloading of template function
- Non-type Template argument
- Primary and Partial Specialization
- Introduction to STL
- Overview of iterators, containers

Reference Books:

- 1) Complete Reference C++ by Herbert Schildt McGraw Hill Publications
- 2) Computer Science- A Structured approach using C++ by Forouzan, Gilburg, THOMSON
- 3) Object Oriented Programming in C++ - E. Balagurusamy, BPB
- 4) Object Oriented programming in C++ by Robert Lafore, Pearson Education
- 5) Mastering C++ - Venugopal
- 6) The C++ Programming Language by Bjarne Stroustrup, Pearson Education
- 7) Object Oriented Programming in C++ - Robaret Laphore
- 8) Let us C++ - Yashvant Kanitkar, BPB

Reference Website

- 1) <https://www.tutorialspoint.com/cplusplus/>
- 2) <https://www.javatpoint.com/cpp-tutorial>
- 3) <https://www.studytonight.com/cpp/>
- 4) <https://www.programiz.com/cpp-programming/examples>

CS – 14 : CMS with Word Press & Magento

Unit-1 : Introduction to OOP & WORDPRESS

- Concept of OOP
 - Class, Property, Visibility, Constructor, Destructor, Inheritance Scope Resolution Operator (: :), Auto loading Classes, Class Constants
- MySQLi Database handling with OOP (insert, update, select, delete, search, count)
- Introduction to WordPress
- What is Content Management System (CMS)?
- Advantages & Disadvantages of WordPress
- Installation of WordPress.
- WordPress Directory & file structure.
- Dashboard overview
- How to add, edit and delete page, category, post, tag.
- Add new media file (image, pdf, doc etc.) & attach to post or page.
 - User Roles and Capabilities.
- Setting
 - General, writing, Reading, Discussion, Media, Permalinks
- Updating WordPress
 - One-click Update, Manual Update, Database Structure

Unit-2 : Theme & Widget

Theme

- What is theme?
- How to install & activate theme.
- Introduction of common WordPress theme template files.
- Anatomy of a Theme :
 - header.php, footer.php and sidebar.php
- Introduction of Template Files
 - style.css, index.php, page.php, home.php, archive.php, single.php, comments.php, search.php, attachment.php, 404.php, category.php, tag.php, author.php, date.php

Widget

- What is widget & widget Areas?

- Widget Management
- Available Widgets (Archive, Calendar, Categories, Custom Menu, Meta, Pages, Recent Comments,
- Recent Posts, RSS, Search, Tag Cloud, Text)
 - Inactive Sidebar (not used)
 - Inactive Widgets

Plugin

- What is plugin?
- How to install and activate plugin.
- Useful plugins for website.
- Seo yoast
- Contact form 7
- WooCommerce
- Page Builder

Unit-3 : Advance Template Tag with Theme Development

- The Loop (have_posts (), the_post())
- Template Tags
 - General tags
 - wp_head(), get_footer(), get_header(), get_sidebar(), get_search_form(), bloginfo(), wp_title(), single_post_title(), wp_footer(), comments_template(), add_theme_support(), get_template_directory_uri(), body_class()
 - Author tags
 - the_author(), get_the_author(), the_author_link(), get_the_author_link(), the_author_meta(), the_author_posts()
 - Category tags
 - category_description(), single_cat_title(), the_category()
- Link tags
 - the_permalink(), get_permalink(), home_url(), get_home_url(), site_url(), get_site_url()
- Post tags
 - the_content(), the_excerpt(), the_ID(), the_tags(), the_title(), get_the_title(), the_date(), get_the_date(), the_time(), next_post_link(), previous_post_link(), posts_nav_link(), post_class()
- Post Thumbnail tags
 - has_post_thumbnail(), get_post_thumbnail_id(), the_post_thumbnail(), get_the_post_thumbnail()
- Navigation Menu tags
 - wp_nav_menu()
- Conditional Tags
 - is_archive(), is_category(), is_front_page(), is_home(), is_page(), is_single(), is_search(), is_attachment(), is_active_sidebar()
- functions.php file
- Theme Development

Unit-4 : Setting up and Installing Magento

- Introduction to Magento Basic
 - Magento Overview
 - Magento Installation
 - Magento Architecture
- Magento Store Setup
 - Magento - Product Overview
 - Magento - Setup Languages
 - Magento - Setup Contact
 - Magento - Setup Categories
 - Magento - Setup Products

Unit-5 : Setup Payment and Ordering System

- Setup Inventory and Payment Option
 - Magento - Setup Inventory
 - Magento - Setup Taxes
 - Magento - Setup Shipping Rates
 - Magento - Setup Payment Plans
 - Magento - Setup Payment Gateway
 - Magento - Setup Payment Methods
 - Magento - Setup Currencies
 - Magento - Setup Check Out Options
 - Magento - Setup Paypal Payment
 - Magento - Setup Google Checkout
 - Magento - Setup Store Live
- Setup Ordering
 - Magento Order Processing
 - Magento - Orders Life Cycle
 - Magento - Setup Order Options
 - Magento - Setup Order Emails
 - Magento - Create Orders
 - Magento - Manage Orders

Reference Books:

- 1) Build Your Own WordPress Website: An Ultimate Guide for Small Business Owners Paperback by WordPress Genie
- 2) Teach Yourself VISUALLY Word Press Paperback –by George Plumley 3rd Edition.
- 3) WordPress for Beginners 2017: A Visual Step-by-step Guide to Mastering Word press Paperback – by Dr. Andy Williams.
- 4) WordPress to Go: How to Build a WordPress Website on Your Own Domain, from Scratch, Even If You Are a Complete Beginner Paperback –by Sarah Mcharry (Author)

Reference Website

- 1) <https://www.tutorialspoint.com/wordpress/>
- 2) <https://www.wpbeginner.com/category/wp-tutorials/>
- 3) <https://www.siteground.com/tutorials/wordpress/>
- 4) <https://learn.wordpress.com/>
- 5) https://codex.wordpress.org/WordPress_Lessons
- 6) <https://ithemes.com/tutorial/category/wordpress-101/>
- 7) <https://www.tutorialspoint.com/magento/>
- 8) <https://www.siteground.com/tutorials/magento/>
- 9) <https://blog.magestore.com/magento-tutorial/>
- 10) <https://www.cloudways.com/blog/magento/>
- 11) <https://code.tutsplus.com/courses/magento-fundamentals>
- 12) https://www.youtube.com/playlist?list=PLgOUQYMnO_STuEpuiUhh7NXCQuw5igXnP
- 13) https://www.tutorialspoint.com/magento/magento_tutorial.pdf

CS – 15 : Network Technology & Administration with SEO

Unit-1 : Basic of Network and LAN Sharing with Transmission Media

- Network concepts
 - What is network
 - Use of network
- Network Services
- Network Access Methods
 - csma / cd, csma / ca,
 - Token passing
 - Polling
- Advanced Network Topologies Ethernet, CDDI, FDDI
- Communication Methods
 - Unicasting
 - Multicasting
 - Broadcasting
- OSI Reference model with 7 Layers
- TCP/IP network model with 4 Layers
- File and Print sharing in LAN
- Encryption & Compression

- Transmission Media
 - Types of Transmission media
 - Guided media
 - Co – Axial Cable,
 - Twisted Pair Cable,
 - Crimping of Twisted pair cable
 - Fiber Optic Cable
- Unguided media
 - Infrared, Laser, Radio, Microwave,
- Multiplexing & Demultiplexing
- Cable network devices
- Wireless network devices

Unit-2 : Network Protocols, Network Routing and IP Addressing

- Packets & Protocols
- Conn. Oriented Protocols -TCP& connection less protocols-UDP
- What is routing
- Types of Routing
 - static ○ dynamic ○ default
- What is IP address?
- How to configure IP Address in PC
- What is DHCP?
- Static IP & Dynamic IP
- Types of IP address
- Ipv4
 - Class structure
 - subnetting, supernetting
- Ipv6
 - Basic structure of ipv6
 - Implementation of ipv6

Unit-3 : Basics of Network Security, Internet connection & Sharing

- Fundamental of Network Security
- Security methods
 - Encryption
 - Cryptography
 - Authentication
- Security Principle –CIA Model
- Basics of Internet
- How internet is connecting with computer
- Technology related internet
 - Dial up tech.
 - ISDN network tech.
 - Lease line tech.
- VPN
 - Types of VPN
 - Use of VPN
 - VPN protocols (PPTP, L2TP, IPsec.)
- Proxy server, Firewall
- GPS, GPRS
- CCTV tech.

Unit-4 : Search Engine Basics and First Stages of SEO

- The Mission of Search Engines
- The Market Share of Search Engine

- The Human Goals of Searching
- How People Search?
- Types of Queries
- Eye Tracking: How Users Scan Results Pages?
- Click Tracking: How Users Click on Result? Natural Versus Paid
- Understanding Search Engine Results
- Algorithm – Based Ranking Systems: Crawling Indexing, and Ranking
- Advanced Search Techniques / Operators
- Setting SEO Goals and Objectives
- The Major Elements of Planning
- Identifying the Site Development Process and Players
- Defining Site's Information Architecture
- Combining Business Assets and Historical Data to Conduct SEO/Website SWOT Analysis

Unit-5 : Developing an SEO – Friendly Website with Keyword Research

- The Theory Behind Keyword Research – Long Tail & Short Tail
- Making Site Accessible to Search Engines
- Creating an Optimal Information Architecture
- Root Domains, Subdomains, and Microsites
- Keyword Targeting
- Content Optimization
- Duplicate Content Issues
- Content Delivery and Search Spider Control
- Keyword Research Tools
- XML Sitemaps
- Flat Versus Deep Architecture
- The Opportunities in Vertical Search
- The Increasing Importance of Local, Mobile, and Voice Recognition Search
- The Ongoing Evolution of Search
- Practical demo of Blog Website Using WordPress or Google Blogger

Reference Books:

- 1) Networking Essential - Glenn Berg Tech. Media
- 2) MCSE Self-Paced Training Kit (Server 2003)
- 3) Data Communication and Networking - B A Forouzan
- 4) The Art of SEO : Mastering Search Engine Optimization By Eric Enge, Stephan Spencer, Rand Fishkin, Jessie C Stricchiola, O'Reilly Media, October, 2009
- 5) Web Searching Technology and Search Engine Optimization[ISBN: 978 - 93 - 81786 - 92 - 5] by Bharat & Company
- 6) SEO: Search Engine Optimization Bible, By Jerri L. Ledford, 2nd Edition, Wiley India, April, 2009
- 7) SEO Warrior: Essential Techniques for Increasing Web Visibility By John I Jerkovic, O'Reilly Media, November, 2009

CS – 16 : RDBMS Using ORACLE (10 G)

Unit-1 : DBMS Overview, SQL & SQL *Plus

- Introduction to DBMS
- Introduction to RDBMS
- Dr. E. F. Codd Rules
- Instruction of E.R. Diagram
- Importance of E.R. Diagram in Relational DBMS.
- Relations between Entities
- Normalization
- Introduction to SQL

- SQL Commands and Datatypes
- Introduction to SQL*Plus
- Operator and their types
- Expression
- SQL v/s SQL*Plus

Unit-2 : Managing Tables and Data, Data Control and Transaction Control Command

- Creating, Altering & Dropping tables
- Data Manipulation Command like Insert, update, delete etc...
- Integrity Constraints, their type and applying of constraints
- SELECT statement with WHERE, GROUP BY and HAVING, ROLLUP AND CUBE, ORDER BY, DISTINCT, Special operator like IN, ANY, ALL, BETWEEN, EXISTS, LIKE
- Join (Inner join, outer join, self-join)
- subquery, minus, intersect, union

Built in functions

- **Numeric Function**
abs, ceil, exp, floor, greatest, least, log, max, min, rem, round , sign, sqrt
- **Character Function**
chr, concat, initcap, lower, upper, lpad, rpad, ltrim, rtrim, trim, replace, substr, treat
- **Date Function**
add_months, last_day, months_between, next_day, round (date), sysdate, systimestamp, trunc (date), to_date, to_char
- **Aggregate function**
Sum, Count, Avg, Max, Min
- **General Functions**
Coalesce, Case, When, Decode
- Creating user & role
- Grant, Revoke command
- What is transaction?
- Starting and Ending of Transaction
- Commit, Rollback, Save Point

Unit-3 : Other ORACLE Database Objects, Concurrency control using lock

- View and their types
- Sequence
- Synonyms
- Database Links
- Index & their types (simple index, composite index, unique index, bitmap, function base index, B-tree index)
- Cluster
- Snapshot
- Types of Files (Data file, Redo log file, Control File, Archive File)
- What Are Locks? Types of Locks (shared lock, exclusive lock, DML lock, DDL lock, latch)
- Levels of Locks (Row level, Page level, Table level)
- Lost Updates
- Deadlocks
- Blocking

Unit-4 : Introduction to PL/SQL, Advanced PL/SQL

- SQL v/s PL/SQL
- PL/SQL Block Structure
- Language construct of PL/SQL(Variables, Basic and Composite Data type, Conditions looping etc.)

- %TYPE and %ROWTYPE
- Cursor, their types (Implicit, Explicit), steps, Attributes
- Exception Handling
- Creating and Using Procedure and Functions
- Package
- Triggers, parts of trigger and types of trigger
- Tables, Nested Tables, Varrays
- Creating Objects and use of this object

Unit-5 : Oracle Database Structure and Storage Database, Resource Management

- Instance Architecture (Database Processes, Memory Structure)
- Creating & Altering Database
- Opening & shutdown Database
- Data dictionary
- Control Files, Redo Logs files
- Tablespace (Create, Alter, Drop), types of tablespace (system, read only, temporary, tool, user, data
- and index, rollback)
- Rollback Segment (Create, Alter) (System & Transaction RBS)
- Oracle Blocks
- Import
- Export
- SQL*Loader
- Oracle Scheduler Concepts
- Managing Resources with Oracle Database Resource Manager

Reference Books :

- 1) Oracle Database 12c The Complete Reference (Oracle Press) by Bob Bryla , Kevin Loney –Oracle Press
- 2) Oracle Database 12c SQL –Jason Price –Oracle Press
- 3) Oracle Database 12c PL/SQL Programming by McLaughlin–Oracle Press
- 4) QL,PL/SQL The programming -Lang.Of Oracle Ivan Bayross -BPB

Web site References:

- 1) <https://www.tutorialspoint.com/sql/index.htm>
- 2) <https://www.tutorialspoint.com/plsql/index.htm>
- 3) <https://www.oreilly.com/library/view/oracle-sqlplus-the/0596007469/ch01s01.html>
- 4) https://docs.oracle.com/cd/B19306_01/server.102/b14357/qstart.htm
- 5) <http://www.sql-plus.com/differences-between-sql-plus-and-sql.php>
- 6) <http://www.oracle.com/us/corporate/features/database-12c/index.html>

CS-17 : Practical-1 (Based on CS - 13 & CS - 16)	
Topic	Marks
CS - 13 : C++ and Object – Oriented Programming	50
CS - 16 : RDBMS Using Oracle (10 G)	50

CS-18 : Practical-2 (Based on CS - 14 & CS - 15)	
Topic	Marks
CS - 14 : CMS With WordPress & Magento	50
CS - 15 : Network Technology & Administration With SEO	50

B.Sc.(IT) & B.C.A. SEMESTER – IV

CS-19 : Programming with JAVA

Unit-1 : History, Introduction & Language, Basics Classes and Objects

- History and Features of Java
- Java Editions
- JDK, JVM and JRE
- JDK Tools
- Compiling and Executing basic Java Program
- Java IDE (NetBeans and Eclipse)
- Data Type (Integer, Float, Character, Boolean)
- Java Tokens (Keyword, Literal, Identifier, Whitespace, Separators, Comments, Operators)
- Operators (Arithmetic, Relational, Boolean Logical, Bitwise Logical, Assignment, Unary, Shift, Special operators)
- Type Casting
- Decision Statements (if, switch)
- Looping Statements (for, while, Do-While)
- Jumping Statements (break, continue, return)
- Array (One Dim., Rectangular, Jagged)
- Command Line Argument Array
- OOP Concepts (Class, Object, Encapsulation, Inheritance, Polymorphism)
- Creating and using Class with members
- Constructor
- finalize () method
- Static and Non-Static Members
- Overloading (Constructor & Method)

Unit-2 : Inheritance, Java Packages

- Universal Class (Object Class)
- Access Specifiers (public, private, protected, default, private protected)
- Doing Inheritance
- Constructors in inheritance
- Method Overriding
- Interface
 - Defining Multiple Interface in a single program
 - Execution of interface in simple application
 - Perform the Hybrid Inheritance program using Interface.
- Nested and Inner Class
- Abstract and Final Class
- Normal import and Static Import
- Introduction to Java API Packages and imp. Classes
 - java.lang
 - java.util
 - java.io
 - java.net
 - java.awt
 - java.awt.event
 - java.applet
 - java.swing
- java.lang Package Classes
 - Math
 - Wrapper Classes
 - String
 - String Buffer
 - Number
 - Package
- java.util Package Classes
 - Random
 - Date
 - GregorianCalendar
 - Vector
 - HashTable
 - StringTokenizer
 - SimpleTimeZone
 - Stack
 - Scanner
- Creating and Using User Defined package and sub-package

Unit-3 : Exception Handling, Threading and Streams (Input and Output)

- Introduction to exception handling
- try, catch, finally, throw, throws
- Creating user defined Exception class
- Thread and its Life Cycle (Thread States)
- Thread Class and its methods
- Synchronization in Multiple Threads (Multithreading)
- Deamon Thread, Non-Deamon Thread
- Introduction of Stream and its types
 - Input
 - Output
 - Character
 - Byte
- File and RandomAccessFile Class [Theory Concept only]
- StreamTokenizer Class
- Piped Streams Introduction only
- Bridge Classes :
 - InputStreamReader
 - OutputStreamWriter
 - Implementation of Text file handling program using Reader Class and Writer Class.

Unit-4 : Applets & Layout Managers

Applets

- Introduction to Applet
- Applet Life Cycle
- Implement & Executing Applet with Parameters
 - Playing Audio Example
- Graphics class

Layout Managers

- FlowLayout
- BorderLayout
- CardLayout
- GridLayout
- GridBagLayout
- Introduction of
 - BorderLayout [Only Theory]
 - SpringLayout [Only Theory]
 - GroupLayout [Only Theory]
- Using NO LAYOUT Manager

Unit-5 : GUI using SWING Event Handling

- Introduction to AWT and Swing
- Difference Between AWT and Swing Components
- Swing Components
 - JFrame
 - JPanel
 - JLabel
 - JButton
 - JRadioButton
 - JCheckBox
 - JPasswordField
 - JTextArea
 - JScrollBar
 - JComboBox
 - JList
 - JToggleButton
 - JTabbedPane
 - JSlider
 - JProgressBar
 - JTextPan
- Menus
 - JMenuBar
 - JMenu
 - JMenuItem
- Introduction to Event Handling
- Event Delegation Model
- Event Packages
 - AWT Event Package
 - Swing Event Package

- Event Classes
 - ActionEvent
 - ItemEvent
 - FocusEvent
- Listener Interfaces
 - ActionListener
 - ItemListener
 - FocusListener
- Adaptor Classes
 - FocusAdaptor
 - KeyAdaptor
 - MouseAdaptor
 - MouseMotionAdaptor
- MouseEvent
- MouseWheelEvent
- TextEvent
- WindowEvent
- KeyListener
- MouseListener
- MoutMotionListener
- TextListener
- WindowListener, etc

Reference Books:

- 1) Java: A Beginner's Guide – Jul 2014 by Herbert Schildt
- 2) Java Programming (Oracle Press) by Poornachandra Sarang
- 3) Java The Complete Reference, 8th Edition –by Herbert Schildt
- 4) Ivor Horton's "Beginning Java 2" JDK 5 Edition, Wiley Computer Publishing.
- 5) Ken Arnold, James Gosling, David Holmes, "The Java Programming Language", Addison-Wesley Pearson Education.
- 6) Cay Horstmann, "Big Java", Wiley Computer publishing (2nd edition – 2006).
- 7) James Gosling, Bill Joy, Guy Steele, Gilad Bracha, "The Java Language Specifications", Addison- Wesley Pearson Education (3rd edition) Download at <http://docs.oracle.com/javase/specs/>

Reference Website

- 1) <https://www.tutorialspoint.com/java/>
- 2) <https://www.w3schools.com/java/>
- 3) <https://www.javatpoint.com/java-tutorial>
- 4) <https://www.guru99.com/java-tutorial.html>

CS-20 : Programming with C#

Unit-1 : .NET Framework & Visual Studio IDE, Language Basics

- Introduction to .NET Framework
- Features / Advantages
- CLR, CTS and CLS
- BCL / FCL / Namespaces
- Assembly and Metadata
- JIT and types
- Managed Code and Unmanaged Code
- Introduction to .NET Framework and IDE versions
- Different components (windows) of IDE
- Types of Projects in IDE (Console, Windows, Web, Setup, etc.)
- Data Types (Value Type & Reference Type)
- Boxing and UnBoxing
- Operators (Arithmetic, Relational, Bitwise, etc.)
- Arrays (One Dimensional, Rectangular, Jagged)
- Decisions (If types and switch case)
- Loops (for, while, do..while, foreach)

Unit-2 : Class and Inheritance, Property, Pointers, Delegates, Event, Collections

- Concept of Class, Object, Encapsulation, Inheritance, Polymorphism
- Creating Class and Objects
- Methods with "ref" and "out" parameters

- Static and Non-Static Members
- Constructors
- Overloading Constructor, Method and Operator
- Inheritance
- Sealed Class & Abstract Class
- Overriding Methods
- Interface inheritance
- Creating and using Property
- Creating Pointer (Unsafe Code)
- Creating and using Delegates (Single / Multicasting)
- Creating and using Events with Event Delegate
- Collections (ArrayList, HashTable, Stack, Queue, SortedList) and their differences.

Unit-3 : Windows Programming

- Creating windows Application
- MessageBox With DialogResult class
- Basic Introduction to Form and properties
- Concept of adding various Events with event parameters
- Different Windows Controls
Button, Label, TextBox, RadioButton, CheckBox, ComboBox, ListBox, PictureBox, ScrollBar, TreeView, Menu (MenuStrip, ContextMenuStrip), ToolStrip, Timer, Panel and GroupBox
- Dialog Boxes (ColorDialog, FontDialog, SaveFileDialog and OpenFileDialog)
- MDI Concept with MDI Notepad (RichTextBox)

Unit-4 : Database Programming with ADO.NET

- Concept of Connected and Disconnected Architecture
- ADO.NET Architecture
- Data Providers in ADO.NET
- Connection Object
- Connected Architecture
Command, DataReader
- Disconnected Architecture
DataAdapter , DataSet , DataTable , DataRow , DataColumn , DataRelation , DataView
- Data Binding
- GridView Programming

Unit-5 : User Controls (Components), Crystal Reports, Setup Project

- Creating User Control with
Property, Method, Event
- Using User Control in Windows, Projects as component,
- Creating Crystal Reports
- Types of Reports
- Report Sections
- Formula, Special Field and Summary in Report
- Types of Setup Projects
Creating Setup Project
File System Editor
User Interface Editor
Launch Conditions Editor

Reference Books:

- 1) Pro C# 5.0 and .NET 4.5 Framework (By: Andrew Troelsen)
- 2) Head First C# - (By: Jennifer Greene, Andrew Stellman)
- 3) C# 5.0 Unleashed - (By: Bart De Smet)
- 4) Adaptive Code Via C# (By: Gary McLean Hall)

- 5) C#.NET Programming Black Book - steven holzner -dreamtech publications
- 6) Introduction to .NET framework - Wrox publication
- 7) Microsoft ADO. Net - Rebecca M. Riordan, Microsoft Press

Reference Website

- 1) <https://www.tutorialspoint.com/csharp>
- 2) <https://www.tutorialsteacher.com/csharp/csharp-tutorials>
- 3) <https://www.javatpoint.com/c-sharp-tutorial>

CS - 21 : SAD, Software Quality Assurance and Testing

Unit-1 : System Analysis & Design AND Software Engineering, Concepts of Quality Assurance

- Definitions: System, Subsystem, Business System, Information System (Definitions only)
- Systems Analyst (Role: Information Analyst, Systems Designer & Programmer Analyst)
- SDLC
- Fact – finding techniques (Interview, Questionnaire, Record review and observation)
- Tools for Documenting Procedures and Decisions - Decision Trees and Decision Tables
- Data Flow analysis Tool
 - DFD (context and zero level) and Data
 - Dictionary
- Software Engineering : (Brief introduction)
- Introduction to QA
- Quality Control (QC)
- Difference between QA and Q
- Quality Assurance activities

Unit-2 : Basics of Software Testing, Types of Software Testing, Verification and Validation

- Introduction to software Testing
- Software faults and failures - Bug/Error/Defect/Faults/Failures
- Testing Artefacts
 - Test case
 - Test Script
 - Test Plan
 - Test Harness
 - Test Suite
- Static Testing
 - Informal Review
 - Walkthrough
 - Technical Review
 - Inspection
- Dynamic Testing
- Test levels
 - Unit Testing
 - Integration Testing
 - System Testing
 - Acceptance Testing
- Techniques of software Testing
- Black Box Testing
 - Equivalence Partitioning
 - Boundary Data Analysis
 - Decision Table Testing
 - State Transition Testing

- White Box Testing
 - Statement testing and coverage
 - Decision testing and coverage
- Grey Box Testing
- Non-functional Testing
 - Performance Testing
 - Stress Testing
 - Load Testing
 - Usability Testing
 - Security Testing

Unit-3 : Software Development Life Cycle Models, Automated Testing

- Waterfall Model
- Iterative Model
- V-Model
- Spiral Model
- Big Bang Model
- Prototyping Model
- Introduction
 - Concept of Freeware, Shareware, licensed tools
- Testing Tools
 - Win runner
 - Load runner
 - QTP
 - Rational Suite

Unit-4 : Project Economics, Project scheduling and Tracking

- Concepts of Project Management
- Project Costing based on metrics
- Empirical Project Estimation Techniques.
- Decomposition Techniques.
- Algorithmic methods.
- Automated Estimation Tools
- Concepts of project scheduling and tracking
- Effort estimation techniques
- Task network and scheduling methods
- Timeline chart
- Pert Chart
- Monitoring and control progress
- Graphical reporting Tools

Unit-5 : CAD Project Management Tool, UML

- MS – VISIO for designing & Documentation
- MS – Project for controlling and Project Management
- UML designing and skill-based tools
- Overview of
 - Class Diagram
 - Use Case Diagram
 - Activity Diagram

Reference Books:

- 1) Analysis & Design of Information System - James A. Sen.
- 2) Pankaj Jalote, "Software Engineering – A Precise Approach", Wiley India
- 3) UML Distilled by Martin Fowler, Pearson Edition, 3rd Edition
- 4) Fundamentals of Software Engineering – RajibMall (PHP)
- 5) Software Engineering – A Practitioner's Approach – Pressman

- 6) UML – A Beginner’s Guide –Jasson Roff – TMH
- 7) Roger Pressman , “Software Engineering”

Reference Website

- 1) http://en.wikipedia.org/wiki/Software_testing
- 2) <http://www.onestoptesting.com/>
- 3) <http://www.opensourcetesting.org/functional.php>

CS-22 : Operating Systems Concepts with Unix / Linux

Unit-1 : Introduction, Process Management, Memory Management

- Meaning of OS
 - Functions of OS
 - Features of OS
 - OS Types (Features Point of View)
- Introduction of OS process
 - Process State Transition Diagram
 - Process Scheduling
 - FCFS
 - SJN
 - Round Robin
 - Priority Base Non Preemptive
 - Priority Base Preemptive
- Physical Memory and Virtual Memory
 - Memory Allocation
 - Contiguous Memory Allocation
 - Noncontiguous Memory Allocation
 - Virtual Memory Using Paging
 - Virtual Memory Using Segmen

Unit-2 : Getting Started with Unix, Unix Shell Command, Text Editing With vi Editor,

- Unix Architecture
- Unix Features
- Types Of Shell (C, Bourn, Korn)
- Unix File System
 - Types Of Files
 - Ordinary Files
 - Directory Files
 - Device Files
- Unix File & Directory Permissions
 - Connecting Unix Shell : Telnet
- Login Commands passwd, logout, who, who am i, clear
- File / Directory Related Command
ls, cat, cd, pwd, mv, cp, ln, rm, rmdir,
mkdir, umask, chmod, chown, chgrp,
find,pg,more,less,head,tail,wc,touch
- Operators in Redirection & Piping
<
>
<<
>>
|
- Advance Tools
 - Finding Patterns in Files
 - grep,fgrep,egrep

- Working with columns and fields
- cut,paste,join
- Tools for sorting
- sort,uniq
- Comparing files : cmp,comm.,diff
- Changing Information in Files : tr, sed,
- Examining File Contents : od
- Monitoring Input and Output tee,script
- Tools For Displaying Date and Time cal,date
- Communications telnet,wall, write,mail,news,finger
- Process Related Commands :
- ps, command to run process in background,
- nice,kill,at,batch,cron, crontab,wait,sleep
- Concept of Mounting a File System
- mount command
- Concept of DeMounting a File System
- umount command
- Introduction of vi editor
- Modes in vi
- Switching mode in vi
- Cursor movement
- Screen control commands
- Entering text, cut, copy, paste in vi editor

Unit-3 : Shell Programming Getting Started with Linux, Linux Booting

- Shell Keywords
- Shell Variables
- System variables
- PS2, PATH, HOME,LOGNAME,
- MAIL, IFS, SHELL
- User variables
- set, unset and echo command with shell
- variables
- Interactive shell script using read and echo
- Decision Statements
 - if then fi
 - if then else fi
 - if then elif else fi
 - case esac
- test command
- Logical Operators
- Looping statements
 - for loop
 - while loop
 - until loop
 - break, continue command
- Arithmetic in Shell script
 - Various shell script examples
- History of Linux
- GNU, GPL Concept
- Open Source & Freeware
- Structure and Features of Linux
- Installation and Configuration of Linux Using with Ubuntu
- Startup, Shutdown and boot loaders of Linux
- User Interfaces (GUI and CUI)

Unit-4 : Working with X-Windows (Ubuntu)

- Layered Structure of X
 - Window Manager
 - Desktop Environment
 - Start Menu
 - User Configuration
 - startx Command
- Window Managers
 - GNOME
 - KDE
 - Purpose of window manager
- The KDE Desktop
 - KDE Panel
 - Desktop Icons
 - Managing Windows
 - The KDE Control Panel
- The GNOME Desktop
 - The GNOME Panel
 - Desktop Icons
 - Managing Windows
 - The GNOME Control Panel
- Create, Delete, Rename, Copy files and folders
- Install / Uninstall Software

Unit-5 : Linux Admin (UBUNTU)

- Creating Linux User Account and Password
- Installing and Managing Samba Server
- Installing and Managing Apache Server
- Optimizing LDAP Services
- Optimizing DNS Services
- Optimizing FTP Services
- Optimizing Web Services
- Configure Ubuntu's Built-In Firewall
- Working with WINE

Reference Books:

- 1) Stalling W, "Operating Systems", 7th edition, Prentice Hall India.
- 2) Silberschatz, A., Peter B. Galvin and Greg Gagne, "Operating System Principles", Wiley-Indian Edition, 8th Edition
- 3) Unix Shell Programming - Y. Kanetkar- BPB Publications
- 4) Unix concepts and applications- Sumitabha Das

CS - 23 : Practical-1 (Based on CS - 19)	
Topic	Marks
CS - 19 : Programming With Java	100

CS - 24 : Practical-2 (Based on CS - 20 & CS - 22)	
Topic	Marks
CS - 20 : Programming with C#	50
CS - 22 : Operating Systems Concepts with Unix/Linux	50