ज्ञानगंगा घरोघरी

Yashwantrao Chavan Maharashtra Open University, Nashik

School of Computer Science

Syllabus Booklet
(2009-10)

First year BCA
First year BSc (BIS)
Certificate Programmes

Index

CMP130	Visual Basic

- **Visual Basic Programming Fundamentals:** Forms; Creating a Simple Project; Working with Variables, Constants, Data Types, Statements, Operators, Conditional Control Structures; Working with Visual Basic Code Editor, Dialog Boxes, in-built Functions; Data Validation and Data Type Testing Functions; Working with Format functions, Sub Procedures and Functions, Sequential and Random Access Files, Subscripted Arrays, Control Arrays, Microsoft Common Dialog Control; Working with Menus, Multiple Forms, File Access Controls and File System Objects
- **Visual Basic Controls:** ListBox, ListBox and ComboBox Properties, Frame and OptionButton, CheckBox, Label, TextBox and RichTextBox, MaskEdBox , Scroll Bars and Slider, UpDown, Timer and Progress Bar, Status Bar, Tabbed Dialog, ToolBar, Picture Box and Image, ImageList, CoolBar, MonthView, Graphic Controls and methods
- **Database Management in VB:** Visual Data Manager, DAO Data Control, Accessing Data Using DAO Programming, Creating Database using DAO, ADO Data Control, ADO Data-Bound controls, ADO Objects through Code, Data Environment Designer, Data Form Wizard, Structured Query, Query Designer in DED, QBE in MS Access and VisData, Creating Database Using ADO Model, Data Report Designer Data Reports for Multiple Tables, DataGrid, MSHFlexGrid, TreeView , and Listview   , Controls, DataRepeater Control, MSChart control, OLE Control, MCI Control, Creating On-Line Help

CMP201	Programming Expertise in "C"

- History of C, Character Set, Constants, Variables, Keywords, Type Declaration, Simple I/O Statements, Comments, First C Program
- C Compilers, IDE, C Instructions, Modes of Arithmetic Operations, Hierarchy of Arithmetic Operators, printf( ), Numbering Systems, Escape Sequences

- Instructions, if-else statement and its various forms, Relational Operators, sizeof Operator
- Logical Operators and their usage, Hierarchy of Operators, Conditional Operators
- Conversions of Basic Data Types, Loop Control Instruction, Increment/Decrement Operators, Binary Representation of float and double
- Break statement, exit( ), while and for statement, various forms of each looping instruction
- do-while Loop, Pros and Cons of different looping statements, break and continue statements, switch statement
- Menu Management, goto keyword, Functions, Returning a Non-Integer Value, Call by value / Call by reference, Recursion, Pointers
- far and near pointers, Accessing VDU Memory, Keyboard Status Bytes, Determining memory size, Size of Pointers
- Recursion and its Advantages, Data Types subtleties, auto, register, static, and extern Storage Classes, Declaration Vs Definition, C Preprocessor
- Preprocessor Directives, Macros, Conditional Compilation, Miscellaneous Directives, #pragma, Arrays, Sorting
- Pointer Arithmetic, Accessing Arrays using Pointers, Passing Arrays to Functions, 2-D and 3-D Arrays, Strings, Strings, String Library Functions
- Structures, Array of Structures, Nested structures, Passing structure elements to Functions, Passing structures to Functions, Applications
- Exploring Floppy and Hard Disk, Boot Sector, Boot Parameters, Reading Boot Sector and Partition Table contents
- Directory Entry, Attribute Byte, Loading / Saving a File, I/O in C, Formatted Output using printf( ), Escape Sequences
- Unformatted Console I/O, Disk I/O, Buffered I/O, File Copying, File Encryption, Offset & Substitution Cipher, Record I/O, Low Level Disk I/O,

- Types of Microprocessors, Display Adapters and Monitors, Graphics and Text Modes, Video Display Modes, Drawing Graphics
- Colors and Palettes, Bitwise Operators, Animation, Mouse Programming, Freehand Drawing
- Interaction with Hardware through C, CPU Registers, Unions, Issuing Interrupts, Renaming and Deleting Files, Booting Procedure
- Memory Organization, Dynamic Memory Allocation, Dangling Pointers, Memory Leaks, Debugging Techniques

CMP202	Data Structure using C

- C Basics
- Searching and Analysis of Algorithms, Hashing Techniques
- Sorting: Algorithms and Merge sort, Quick Sort
- Structures
- Sparse Matrices
- Dynamic memory allocation & Linked Lists
- Operations on Linked Lists
- Circular and Doubly Linked Lists, Sparse Matrices as Linked Lists, Recursive LL, Generalized LL & Unions
- Stacks, Queues, Trees
- Conversions
- Binary Search Trees, Threaded Binary Trees
- Heap, B-Trees and 2-3 Trees
- Graphs, Spanning Tree
- Memory Management
- Garbage Collection

CMP203	OOPs and C++

- Inheritance and Containership
- Shallow Copy

- References
- Dynamic memory management
- Compile-time Polymorphism
- Name mangling
- Templates
- Exception Handling
- Run time polymorphism
- Virtual Functions
- VTABLE & VPTR mechanism
- C++ free store
- Pointers: Pointer to members, Pointer to objects, Smart pointers & their usage, Auto Pointers & their usage
- Sorting techniques
- Algorithms & their selection criteria
- Searching techniques
- Hashing techniques & their selection criteria

CMP204	Office Tools

MS Word XP
- Working with documents, Editing the documents, Spell and Grammar checking
- Formatting the documents
  Character formatting, paragraph formatting, Bullet and numbering, indents, tabs, headers, footers, footnotes, endnotes, borders and shading,
- Viewing a document, Printing the document
- Working with tables, Columns
  Creating, modifying, formatting tables
- Special features of Word, WordArt
- Organization chart
- Mail merge

MS Excel XP
- Exploring Excel Worksheet, Entering data in Worksheets

- Working with Formulas and functions
- Formatting worksheets, Managing, Printing worksheets
- Creating, Formatting Charts, Adding graphs and other objects
- Database Management, Protecting the data
- Special features of Excel

MS Power Point XP
- Exploring Power Point Interface
- Basics of Creating Power Point Presentations
- Managing Text Objects
- Working with Word Art, Drawing Tools
- Creating Organizational Charts
- Formatting Presentations, Building Presentations
- Applying Transition Effects, Animating Presentations
- Incorporating Multimedia clips
- Running the Presentation

MS Outlook XP
- Exploring Outlook XP Interface
- Working with emails, Messages, Contacts
- Working with Calendar, Tasks, Journals
- Working with Security measures
- Customizing Outlook

MS Access XP (Basics)
- Creating Database Applications Worksheet
- Entering data in Worksheets
- Designing Tables from Scratch
- Working with Datasheet View
- Field Properties and Data Validation
- Sorting and Filtering of Records
- Working With Forms, Queries, Action Queries
- Creating Crosstab and Parameter Queries
- Using Functions and Operators in Queries
- Working With Reports
- Creating a Mailing List and Mail Merging

- Working with SubForms and Subreports
- Working with Lookup Fields and Lookup Wizard

| CMP207 | Computer Fundamentals |

Part A: Computer Basics
- **Introduction:** Unit aracteristics of Computers, The Evolution of Computer, The Computer Generations (First Generation, Second Generation, Third Generation, Fourth Generation, Fifth Generation)
- **Basic Computer organization:** Input unit, Output Unit, Storage Unit, Central Processing Unit, Arithmetic Logic Unit, Memory, Control Unit, The System Concept
- **Number Systems:** Non Positional Number Systems, Positional Number Systems, Binary Number Systems, Octal Number Systems, Hexadecimal Number Systems, Converting from One Number system to Another Base, Converting from Decimal to Another Base (Division-Remainder TeUnit nique), Converting from a Base Other than 10to a Base Other Than 10
- **Processor And Memory:** Central Processing Unit (CPU), The Control Unit, The Arithmetic Logic Unit (ALU), Instruction set, Registers, Processor speed, CISC and RISC Processors, EPIC Processors, The Main Memory, Storage Evolution Criteria, Main Memory Organization, Main Memory Capacity, Static and Dynamic R am
- **Secondary Storage Devices:** Sequential and Direct-Access Devices, Magnetic Disk, Advantages and Limitations of Magnetic Disks, Uses of Magnetic Disks, Optical Disks, Basic Principals of Operation, Types of Optical Disks, Advantages and Limitations of Optical Disks, Uses of Optical Disks
- **Input-Output Devices:** Input Devices (Keyboard Devices, Point-and –Draw Devices, Data Scanning Devices, Digitizer, Electronic-Card Reader, Voice Recognition Devices, Vision-Input System, Off-line Data Entry Devices), Output Devices (Monitors, Printers, Plotters, Computer Output Microfilm (COM), Screen Image Projector, Voice Response Systems)

- **Computer Software:** What is Software, Relationship Between Hardware and Software, Types of Software, Application Software, Logical System Architecture
- **Operating System:** Main Functions of an Operating System, Measuring System Performance, Process Management, Process Management in Early Systems, Multiprogramming, Multitasking, Multithreading, Multiprocessing, Time-Sharing, File Management, File Structure, File Access Methods, File Operations, File Naming, Directories/Foldres
- **The Internet:** Definition, Brief History, Its Basic Services, Electronic Mail, File Transfer Protocol, Telnet, Usenet News, Internet Search Engines, Major Elements of Internet Search Engines, Categories of Internet Search Engines, Some Popular Internet Search Engines, Uses of The Internet, How to Get Connected to the Internet?, Direct/Leased-Line Connection, Remote Dial-Up Connection
- **Multimedia:** What is Multimedia, What is a Multimedia Computer system?, Multimedia Components, Text, Graphics, Animation, Audio, Video, Multimedia Applications, Education Entertainment, Marketing, Groupware, Science and Engineering

Part B: Windows 2000
- **Getting started with Windows 2000:** Quick tour of Desktop, Icons, Taskbar
- **Exploring the Start Menu**
- **Working with Window application (Basic of windows):** Structure of a Window, Opening a window application, maximizing, resizing, minimizing, moving window, switching between windows, Closing applications.
- **Working with Files and Folders:** File, Folder, Path, Documents folder, recycle bin, classic style and web style browing
- **Using shortcuts:** Creating shortcut by Drag and Drop, Creating shortcut by Copy and Paste, Creating shortcut by Shortcut wizard, Creating shortcut to drives, renaming and deleting shortcuts

- **Customizing Start Menu:** Adding new items, removing items, customizing personalized menus, Adding favourites to Start Menu, Changing size of Start Menu
- **Running Programs:** What is Program, Starting programs from Start Menu /Explorer/ Search/ desktop/ Run Command, Starting a program automatically when windows starts.
- **Customizing Taskbar:** Structure of Taskbar, properties, moving taskbar, resizing taskbar, working with Quick Launch toolbar, adding new program items to Quick Launch, hiding or removing toolbars
- **Working with My Computer:** Structure of My Computer window, changing views, Customizing toolbars, Customizing the folder display styles, Rearranging Icons display, browsing in separate windows
- **Using Windows Explorer:** File Management, Explorer as file manager, Invoking Explorer; Selecting, copying, moving files and folders, File management using Folder panel
- **Exploring Control Panel:** Getting acquainted, Configuring Mouse, Customizing folders, Setting up user profiles, creating new user account, scheduling tasks
- **Customizing Windows 2000:** Wallpapers, Screen resolution, screen colours, screen savers, Energy saving features, Desktop themes, Creating custom colour scheme, Using Effects
- **Using Windows Help feature:** Getting online help, search criteria tabs, Getting help by contents/ index/ searching/ Favourites, Getting help using Find It Fast feature, Windows 2000 trouble-shooters, Getting help from web pages.
- **Using Search facility:** Searching for file and folders, Search criteria, restricting search, specifying search criteria, Searching for files using text contained in the files, searching by date/ type of file/ file size, searching for people, Searching for information on Internet
- **Maintaining your Computer:** Using windows Task Manager, Scandisk for checking Hard disk for errors, Defragmenting hard disk, Backing up hard disk, restoring backup,Using Disk CleanUp to free up space on the hard disk

- **Windows 2000 Accessaories:** WordPad, NotePad, Paint, Address Book, Media Player, useful applets (Calculator, Games, Character Map)

CMP209	Data Communication & Networking

- **Introduction to Data and Network Communications Software:** Signals, Analogue Versus Digital Transmission, Limits on achievable data rate in digital communication, Data Communication System
- **Data Transmission:** Mode of Data Transfer, Character codes, Digital Data Rates, Transmission Mode, Transmission Impairment, Communication Channel, Channel Capacity, Analogue And Digital Data, Encoding, DTE-DCE Devices, Modem
- **Error Detection and Correction:** Asynchronous Data Error Detection, Asynchronous Data Error Detection Methods, Error Correction
- **Transmission Medium:** Guided Media, Performance of Transmission Medium, Unguided Media, Satellite Communication, Geo-stationary Satellite, Comparisons
- **Introduction to Networking:** Computer Network, Line Configurations, Direction Of Data Flow, Network Topologies, Categories Of Network
- **Reference Models:** ISO/OSI Model, The TCP/IP Model
- Networking And Internetworking Devices Repeater, Bridge, Hub, Switch, Router, Gateway
- **Data Link Layer:** Duties Of Data Link Layer, Elementary Data Link Layer Protocols, Sliding window, Example Data Link Protocols, Mac Address
- **Network Layer:** Network Service Model, Logical Addressing, Network Or Internet Layer Protocol, Routing
- **Transport Layer:** Port Address, Transmission Control Protocol (TCP), User Data gram Protocol (UDP)
- **Application Layer:** The World Wide Web (WWW), Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), Trivial File Transfer Protocol (TFTP), Electronic Mail (E-Mail), Simple

Mail Transfer Protocol (SMTP), Domain Name System (DNS), COMPARISONS: Comparison Of HTTP And FTP
- **BOOTP and DHCP:** Why not RARP?, Bootstrap Protocol (BOOTP), Dynamic Host Configuration Protocol (DHCP)

CMP211	Visual Programming

- Function & Operator Overloading
- Constructors & Destructors
- Preventing Memory Leak & Dangling Pointers
- Inheritance: Private, Public & Protected
- Polymorphism: VTABLE Mechanism
- Templates, Namespaces
- Virtual & Friend Functions
- Interfaces & Abstract Classes
- Design Patterns
- MFC Collection Classes
- GDI: Pens, Brushes, Bitmaps, etc.
- Icons, Colored & Animated Cursors
- Mapping Modes
- Menus, Toolbars, Rebars, Coolbars ,Status Bars
- Dialogs & Controls
- Data Exchange mechanism
- SDI, MDI & Splitter Windows
- Doc / View Architecture, Serialization
- Multithreading & Synchronization
- Network Layers
- Networking Prog. using Sockets
- Creating a Chat system
- How Internet, SMTP & POP3 works
- Building a Browser
- FTP Upload & Download
- Enumerations of Network Resourcses
- DLLs
- ATL COM

- Automation
- ActiveX Controls
- Database programming using ADO
- DCOM, COM+ & DNA
- Message Queuing using MSMQ
- DirectX Architecture : HAL, HEL
- 2D and 3D Transformations
- Direct 3D, DirectDraw, DirectInput
- 3D Primitives : Points, Lines, Triangles
- Index & Vertex buffers
- Color keying technique
- Texture Mapping, Lighting Models
- OS Architecture - HAL, Kernel, Executive
- I/O Manager, Object Manager
- File, Driver & Device Objects
- Building Device Drivers
- WDM Model
- Data Transfer Mechanism
- Handling application requests
- Windows CE.net
- Embedded VC++ applications, Real-time programming
- Threading, Events, Critical Sections
- ISRs, ISTs

CMP212	Building Portals Though ASP.NET

- Introduction To .NET
- Creating First Website
- HIML
- Building Dynamic Websites
- Managing Contacts
- Telephone Contacts User Interface
- Contacts – Professional Style
- Cascaded Style Sheets

- Add Contacts, Delete Contacts, Change Contacts
- Get And Requests
- XML Contacts
- Contact book Using Database
- SOL Contact Class
- Contact List And Contacts Manage Implementation
- Secure Database Programming
- Employee Management Website
  Database Design, Relationships, Database Diagrams And
  Data Entry, Web Form , Finishing Touches
- Grid View Control, Details View Control
- Grid View Edit And Delete

CMP213	Programmomg Excellence Through C #

- Getting Started
- Constants, Variables, Keywords
- First C# Programme
- Using Visual Studio
- Generic Programs
- Instructions
- Precedence And Associativity
- Decision Control Instruction
- Logical Operators, Conditional Operators
- Conversions And Comparisons
- Repetition Control Instruction
- Loops: While, For , Do While
- Case Control Instruction
- Nuances Of Case Control Instruction Menu
- Functions
- Communication Using Functions
- Recursion
- Object Oriented Programming
- Classes And Objects

- Member Functions
- Static Functions
- Arrays
- Property
- Operator Overload
- Bitwise Operators
- Inheritance
- Exception Handling
- User Defined Exceptions
- Abstract Classes
- Interfaces
- Namespaces
- Effective IO
- Filter And Other Streams
- Serialization
- Collection Classes
- Collection And Nested Classes
- Generics
- User Defined Generics
- Networking Today
- Networking And Security
- Network Serialization
- Zip Unzip
- Multithreading And Synchronization
- Web Services
- Using XML Reflection

CMP214	Enterprise solutions using J2EE

- Constants, Variables, Keywords
- First Java Program
- Using NetBeans
- Generic Programs
- Instructions

- Precedence And Associativity
- Decision Control Instruction
- Logical Operators, Conditional Operators
- Conversions And Comparisons
- Repetition Control Instruction
- Loops: While, For, Do While
- Case Control Instruction
- Nuances Of Case Control Instruction Menu
- Functions, Communication Using Functions
- More About Functions
- Recursion
- Object Oriented Programming
- Classes and Objects
- Member Functions, Static Functions
- Arrays
- Using NetBeans Effectively
- Bitwise Operators
- Inheritance
- Exception Handling, User Defined Exceptions
- Abstract Classes
- Packages
- Effective IO
- Fulter And Other Streams
- Serialization
- Collection Classes, Collections And Inner Classes
- Generics Templates
- User Defined Generics
- Networking Today, Networking And Security, Network Serialization
- Zip Unzip
- Multithreading And Synchronization
- WebServices
- Using XML
- Reflection And Annotations

CMP220	Programming Excellence through VB.Net

- Elements of .NET Platform, Common Language Runtime, .NET Base Class Library, Common Type System
- Data types, Type Safety, Type Conversion, Console I/O, Operators, Control Instructions, Loops, Procedures, Call be Ref, Call by Val, Modules
- Difference between Procedural & OO Programming, Classes & Objects, Access Specifiers, Me, References
- Constructors, Overloaded Constructors, Optional keyword, Overloaded functions, Shared Data, Shared Constructor, Read-only, Inheritance, Notinheritable Classes
- Arrays-Rectangular & Jagged, For Each-in loop, Passing Arrays to Methods, System.Array Class
- Strings, System.String Class, Structures, Classes vs. Structures, Reference Types vs. Value Types, ParamArray, Common Type System, Interoperability, Properties, Indexers
- Namespaces, Enumerations, Reflections, Exception Handling
- Polymorphism, VTABLE, Late Binding
- Overridable, NotOverridable, MustInherit, MustOverride, Interfaces, Implmenting Multiple Interfaces
- Collections Namespace, Stack, Queue, Hash table, Dictionary, Ienumerator
- WinForms - GDI+
- GDI+ - Transformations, Processing Mouse & Keyboard Input, Events & Delegates
- Controls, Employee Form, Builing UI
- User Controls, Building application with MSAgent COM component
- SDI, Menus, Toolbars, Statusbars
- File I/O & Serialization, MDI
- Threading, How to launch threads, Thread States, Thread Priorities, Foreground and Background Threads
- Synchronization using Synclock, Monitor, Mutex, Events, R-W Locks and Interlocked mechanism, Thread Pooling
- Multithreading-Synchronization, Thread Pooling, Assemblies, Static and Dynamic linking, Dll Hell, Disadvantages of DLLs, COM

- Assemblies & Manifests, Creating and Using Private & Shared Assemblies, Deployment, Delayed Signing
- Versioning, Redirection, Application Domains, Language Interoperability, COM Interoperability
- Networking Basics, TCP/IP chat, UDP
- Internet, Http GET and POST, Request, Response, Uploading an Downlaoding files using fWebClient
- Software Architecture, ADO.NET Architecture, SQL.NET and OLE DB.NET Data Providers, Creating & Accessing Stored Procedure
- Writing Image to Database, Accessing BLOB, Connected & Disconnected Approaches, Using DataGrid Control, Declarative and Programmatic Transactions
- XML, XML & ADO.NET, XML Document Parser, XML Reader, XML Writer
- Web Architecture, Pros & Cons of Server Scripts/Programs, ASP.NET, Creating ASP.NET Applications, Server Controls
- Validation Controls, Accessing Database Through ASP.NET Application, Web User Controls
- ASP.NET State Management Models, Session States, State Management Through Database, Cookiless State Management
- Distributed Computing Issues, XML WebServices, Creating & Deploying Web Services, WSDL & UDDI, Consuming Web Services, Mobile Client
- Transaction Support, State Management, Web Service Security, Remoting Architecture, Server Activation vs. Client Activation, Web Service vs. Remoting
- Printing, Printing Multi-Page Documents, Common Printing Dialogs
  .NET Security Models, Role Bases Security, Code Access Security

| CMP222 | Computerised Financial Accounting |

- **Need & Importance of Financial Accounting:** Nature of Business Activity & Business Organizations, Need & Importance of Financial Accounting, Nature and Scope of Accounting, Computerised Accounting

- **Principles of Double Entry Book-Keeping:** Basic Accounting Concepts, Principles and Policies, Accounting Process, Process of Computerising Financial Accounting, Creating Company Data, Bank and Banking Operations, Types of Account and Rules of Accounting, Classification of Ledger Accounts – Groups, Creating Ledger Accounts, Passing a Journal Entry, Books of Account
- **Entering Financial Transactions:** General Types of Financial Transactions, Financial Transactions: Source Documents and Journal Entries, Entering the Transactions: Voucher Entry
- **Concept, Form and Contents of Final Accounts:** Final Accounts Adjustments, Profit and Loss Account, Balance Sheet
- **Reports - Display and Printing:** Displaying the Books and Reports, Printing Financial Accounting Reports
- **House keeping:** Year-end Processing, Housekeeping Utilities

CMP223	Computer Organisation

- **Structure of Computer System:** Introduction, brief history of computers, Von Neumann architecture, computer components, computer function, interconnections structures, bus interconnection. Computer Arithmetic – scalar data types, fixed and floating point numbers, signed numbers, integer arithmetic 2's complement addition, subtraction, multiplication, Booths algorithm, hardware implementation, bit-pair recording, division-restoring and non restoring algorithms, floating point representations, IEEE standards, floating point arithmetic
- **Central Processing Unit(Intel 8086 as a representative example):** CPU architecture, register organization, instruction format, addressing modes (8086 and PDP-11), instruction cycle, instruction pipelining.
- **Control Unit:** Single bus organization of a processor, Control unit operation, Instruction sequencing, branching, micro-operations, Hardwired control. Micro-programmed control- microinstruction sequencing and execution, comparison between hardwired and micro-programmed control.
- **Memory Organization:** Characteristics of memory system, memory hierarchy, main memory – ROM: PROM, EPROM,

RAM: SRAM, DRAM, SDRAM, RDRAM, High Speed Memory - Cache memory, organization and mapping, replacement algorithms, cache coherence, MESI protocol. Virtual memory implementation, Secondary storage: Magnetic disk, tape, RAID, CDROM, and DVD

- **Input Output Systems:** I/O addressing, Programmed I/O, Interrupt Driven I/O, Trap, Fault exceptions, 8086 interrupt structure, I/O channels, DMA concept. Standard Buses: Synchronous, asynchronous, parallel, serial, PCI, SCSI, and USB ports, RS-232C, IEEE 488. Study of Peripherals: Keyboard, Mouse, Scanners, Video displays, Printers- Dot-matrix, desk-jet, laser printers
- **OS Support and Advanced Architectures:** Components of operating system (OS), DOS-BIOS, it's loading, DOS-BIOS interrupts, TSR's, Installable device driver, RISC and Super scalar processors: RISC features, register file, RISC vs. CISC, Super scalar processors- Overview and organization

CMP230	Communication Skills & Tech Writing

Part I : Communication Skills
- **Communication:** Meaning of Communication, The Communication Process, Forms of Communication
- **Non-verbal communication**
- **Verbal communication:** Oral Communication (formal, informal), Written Communication (formal, informal)
- **Barriers in Communication**
- **Towards effective communication**

Part II : Technical Writing
- Nature and importance of Technical writing
- Professional communication
- Business Presentations

Part III : Preparing for a Job
- Assessing market requirements
- Identifying personal strengths and weaknesses

- Preparing a Resume / Curriculum Vitae
- Applying for the job
- Facing an interview, Participating in a Group Discussion

CMP242	Humanities & Social Obligation

- **Introduction, nature and scope of Humanities as a concept:** Historical background (occupations, production and markets in various   societies, stands taken by major religions), Role of business, entrepreneurs and governments in the past, Models of Economic development, Concepts of Humanities and Social Obligation in the past

- **A brief review of Indian tradition:** The *Jajmani* (*balutedari*) system-network of production and distribution in the pre-British period, The British rule over India-Policy of the East India company till 1857 and the colonial rule after 1858, De-industrialisation of Indian traditional industries, The movement for *Swadeshi* – production and education for Indian society

- **The Theoretical background of modern industrialisation:** Capitalist model of production and market, Marxist view on production and distribution of commodities, Planning policy and Welfarist model of Indian economy, Globalization, Privatization and Liberalization of national economies

- **Understanding Humanities:** Versatile nature of human beings, Equality, fraternity and equal opportunity as basic values, Human rights (world scenario, Indian situation), Human personality-multi faceted reality

- **Understanding Social Obligation:** Relationship between individual and society, Individual social responsibility : theory and practices, Corporate social responsibility (theory and practices), Social obligation : theory and practices

| **CMP247** | **JAVA** |

- **Fundamentals of Object-Oriented Programming:** Object-Oriented Paradigm, Basic Concepts of Object-Oriented Programming, Benefits of OOP, Applications of OOP
- **Java Evolution:** Java History, Java Features, How Java Differs from C and C++, Java and Internet, Java and World Wide Web, Web Browsers, Hardware and Software Requirements, Java Supports Systems, Java Environment
- **Overview of Java Language:** Simple Java Program, More of Java, Use of Math Functions, Comments, An Application with Two Classes, Java Program Structure, Java Tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command Line Arguments, Programming Style
- **Constants, Variables, and Data Types:** Constants, Variables, Data Types, Declaration of Variables, Giving Values to Variables, Scope of Variables, Symbolic Constants, Type Casting, Getting Values of Variables, Standard Default Values
- **Operators and Expressions:** Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators; Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversions in Expressions, Operator Precedence and Associativity, Mathematical Functions
- **Decision Making and Branching:** Decision Making with If Statement, Simple If Statement, The If….Else Statement, Nested of If….Else Statements, The Else If Ladder, The Switch Statement, The ? : Operator
- **Decision Making and Looping:** The While Statement, The do Statement, The for Statement, Jumps in Loops, Labelled Loops
- **Classes, Objects and Methods:** Defining a Class, Field Declaration, Methods Declaration, Creating Objects, Accessing Class Members, Constructors, Methods of Overloading, Static Members, Nesting of Methods, Inheritance: Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Finalizer Methods, Abstract Methods and Classes, Methods with Vararge, Visibility Control

- **Arrays, Strings and Vectors:** One-dimensional Arrays, Creating an Array, Two-Dimensional Arrays, Strings, Vectors, Wrapper Classes, Enumerated Types, Annotations
- **Interfaces: Multiple Inheritance:** Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interfaces Variables
- **Packages: Putting Classes Together:** Java API Packages, Using System Packages, Naming Conventions, Creating Packages, Accessing a Package, Using a Package, Adding a Class to a Package, Hiding Classes, Static Import
- **Multithreaded Programming:** Creating Threads, Extending the Thread Class, Stopping and Blocking a thread, Life Cycle of a Tread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization; Implementing the 'Runnable' Interface
- **Managing Errors and Exceptions:** Types of Errors, Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, Using Finally Statement, Throwing Our Own Exceptions, Using Exceptions for Debugging

CMP248	Linux

- **Booting, Logging In, and Configuring:** Booting Red Hat Linux, Finishing First-Run Configuration, Logging In for Configuration, Identifying the Parts of the Login Screen, Configuring Your Printer, Configuring Your Dial-Up Internet Service, Starting the Network Configuration Tool
- **Using Linux at the Console:** Understanding Virtual Consoles, Switching Between Consoles,; Introducing the Shell, Fundamentals of Using the Shell, The Windows File System, Files and Directories, The Home Directory, The Current Working Directory, Manipulating Files and Directories, Using Relative Paths, Deleting Files and Directories, Executable Files, Symbolic Links, Understanding Permissions, Long File Listing, Identity and File Ownership, Ownership and File Permissions, Changing Permissions
- **Working with Console:** Creating, Editing, and Saving Text Files, Inserting text in vi; Editing Text in vi, Using emacs to Create Text Files, The emacs Menu Keystrokes, Grouping Files for Efficient

File Management, Grouping Files on the Command Line, Preventing Filename Expansion, Searching Files and Directories Quickly, Searching the Entire Filesystem with locate, Searching Text Files for Word Patterns, Searching for Text Files That Contain Specific Words, Using Command Output for Complex Tasks, Using Pipes to Link Commands, Using One Command's Answers As Another's Argument, Moving Between Multiple Open Applications, Resuming a Job with fg, Running a Job in the Background with bg

- **Getting Help at the Console:** Introducing Manual Pages, Using Manual Pages: The Basics, Understanding Manual Page Sections, Locating Manual Pages Through Topic-Based Searches, Using the GNU info System, Navigating the info System, Using info Efficiently, Using the / usr / share / doc Tree, Reading Extra Application, Documentation, Searching the / usr / share / doc Tree, Getting Help from the Commands

- **Linux Shell:** Sending Text to Standard Output with echo, Performing Simple Calculations with expr, Displaying Text File Beginning or Endings with head and tail, Editing, Streams of Data with sed, Using Shell Variables and Quoting, Creating and Substituting Variables, Environment Variables, Creating Your Own Commands Using Shell Scripting, Processing Command-Line Arguments, Making myscript Easily Executable, Using Conditional Statements, Testing Over and Over Again, Repeatedly Executing for a Predefined Set

- **GNOME and KDE:** GNOME and KDE in Red Hat Linux 8, Logging In to the Desktop , Navigating the Desktop,Launching Application; Using Window Controls, Moving, Resizing, Minimizing, and Maximizing Windows, Application Menus, Working with Multiple Windows, Changing the Active Application, Minimizing and Restoring with the Taskbar, Shading a Window, Understanding Virtual Desktops, Knowing Which Desktop is Active, Selecting a New Desktop, Moving a Running Application to a New Desktop, Using the KDE Window Management Menu, Logging Out of the GNOME Desktop

- **Working with Files on the Desktop:** Creating a New Text File Using the Text Editor, Using the File Manager, Opening a File Manager Window, Navigating the Directory Tree, Working with

Files and Directories, Opening, Editing, and Closing an Existing File, Cutting, Copying, and Pasting Files, Duplicating a File in the Current Directory, Selecting Multiple Files, Creating a symbolic Link, Renaming an Item, Deleting Items, Changing File Permissions, Creating a New Directory, Rearranging or Sorting Icons, Manipulating Files Using Drag and Drop, Moving a File into a Directory or to the Desktop, Moving a File Between Two Directory Windows, Context Drag and Drop, Working with Trash Contents, Restoring Files That Have Been Thrown Away, Emptying the Trash

- **Creating and formatting open office writer document:** The Open Office Applications, Creating and formatting Open Office Writer Document, Working with Open Office Calc, Working with Open Office Impress, Working with Open Office Draw

- **Networking on the Desktop:** Launching the Mozilla Browser, Browsing the Web with Mozilla, Disabling Pop-up Windows, Launching Evolution, Configuring Evolution, Composing a New Email, Using HTML Formatting in Your Message, Attaching a File to Your Message, Sending Your Message, Downloading New Mail, Replying To Or Forwarding a Message, Accessing an Attachment, Printing and Deleting, Exiting Evolution, Accessing Windows Networks, Accessing Files on windows Machines in GNOME, Using File Transfer Protocol (FTP) on the Desktop, Connecting to a Remote System, Copying Files to a Remote System, Copying Files from a Remote System, Closing an FTP Connection

- **Getting Help on the Desktop:** Using Application Help, Using the About Option in Help Menus, Using What's This? In KDE Applications, Viewing Help Contents in GNOME Applications, Viewing KDE Application Handbooks, Using Systemwide Help in GNOME and KDE, Launching and Using GNOME's Help Browser, Launching and Using KDE's Help center, Reading Other Documentation on the Desktop, Reading man and info Pages Using the GNOME Help Browser, Reading man and info Pages Using KDE's Konqueror,

- **Command-Line System Administration:** Using the su Command, Managing System Processes, Listing Running Processes, Adjusting Process Priority, Killing Running Processes, Managing Running Services, Understanding Runlevels, Selecting

Automatically Started Services, Stopping, Starting, and Restarting Running Services, Managing Filesystems, Creating Filesystems, Mounting and Unmounting Filesystems, Maintaining the/etc/fstab File, Managing Accounts, Adding and Removing User Accounts, Adding and Removing Groups, Administering Groups, Changing Group Membership, Using cron to Manage Periodic Jobs, Adding Systemwide cron Processes, Editing Per-User cron Processes

- **Desktop System Administration:** Managing System Processes, Adjusting Process Priority, Killing Running Processes, Managing Running Services, Launching and Quitting the Service Configuration Tool, Enabling or Disabling Services, Stopping, Starting, and Restarting Services, Managing Network Interfaces, Editing Static IP or DHCP Properties, Manually Configuring DNS Information, Enabling or Disabling Network Interfaces, Managing Accounts, Adding and Removing Users, Adding and Removing Groups, Editing Group Membership, Reading System Logs, Mounting and Unmounting Filesystems, Formatting a Device or Partition

- **Security Basics:** Managing the Red Hat Linux Firewall, Starting the Security Level Configuration Tool, Choosing Security Level and Common Services, Understanding Advanced Permissions, Changing File Ownership, Using chmod in Numeric Mode, Understanding Special Permissions, Protecting the Root Account, Enabling the wheel Group, Adding User to wheel, Changing Ownership and Permissions of su, Logging Out Users Automatically, Setting a Login Timeout, Removing Minor Shells

- **Installing Software:** Installing and Removing Red Hat Components, Package management Tool, Third Party Software, Using the rpm Command, Application Launchers

- **Network File Services:** NFS Server Configuration Tool, Configuring NFS at command line, Windows File Sharing Services, Using Desktop Tools to install SWAT, Configuring Samba Shares

- **Web and FTP Services:** Before Configuring Web Server, Configuration of DNS server, Configuring and Running web server, Configuring and Running FTP server

- **Backups, Troubleshooting and Rescue:** Backup and Restore, Troubleshooting

CMP250	**Mathematics for Computers**

- **Relevance of Mathematics**
- **Set Theory:** Set notations, Types of sets, Set Operations, Properties of set operations, Venn diagrams
- **Mathematical Induction:** The first principle of Mathematical Induction, Applications of the first principle of Mathematical Induction
- **Exponents and Logarithms, surds:** Exponential form, integral exponents and Laws of Exponents, Fractional exponents and surds, Logarithms and Laws of Logarithms, Change of Base, Application of Logarithms in complex calculations
- **Number systems:** Binary number system, Conversion of decimal number to binary number and vice versa, Addition and subtraction of binary numbers, Octal and Hexadecimal number systems, Conversion of decimal number to Octal, Hexadecimal number and vice versa
- **Permutations and combinations:** Addition and Multiplication principles of counting, Factorial of a number, Permutations, Combinations
- **Mathematical Logic:** Statements, Logical connectives and Truth tables, Converse, inverse and contrapositive of a statement, Compound statements and Logical equivalence, Tautologies and Contradiction
- **Relations:** Cartesian product of sets, Relations, Matrix representation, Types of Relations, Equivalence Relations and Equivalence Classes, Reflexive closure, Symmetric closure, Transitive Closure
- **Functions:** Functions, Types of functions, Composition of functions
- **Vectors:** Vectors, types of vectors, Algebra of vectors, Products of vectors, Collinear and coplanar vectors
- **Determinants and Matrices:** Determinant, Properties of determinants, Matrix, types of matrices, Algebra of matrices, Inverse of a matrix
- **Mensuration:** Areas of plane figures, Perimeter and circumference, Surface area, Volume

- **System of Linear Equations:** Linear equation, System of linear equations, Solution of System of linear equations, Cramer's Rule
- **Polynomials:** Polynomials in one variable, Degree of Polynomial, Equality of Polynomials, Addition and multiplication of Polynomials, Roots of Polynomial equation, Quadratic equations and their roots
- **Introduction to Graph Theory:** Graph – definition and common terminology in Graph theory, Types of graphs, Connectivity, Eulerian and Hamiltonian graphs, Planar graphs and colouring problem, Trees

CMP255	Operating Systems

- **History of The Operating Systems:** Zeroth Generation, 1st Generation, 2nd generation, 3rd Generation, 4th Generation (Desktop Systems, Multiprocessor Systems, Distributed Processing Clustered Systems, Handheld Systems)
- **Computer Architecture:** 4GL Program, 3GL Program, 2GL Program, 1GL Program (Assembler, Instruction Format, Lading/Relocation), 0GL (Hardware Level) (Basic Concepts, CPU Registers, ALU, The Switches, The Decoder Circuit, The Machine Cycle), Context of a Program, Interrupts (Need, Computer Hardware for Interrupts)
- **Operating System –Functions And Structure:** Different Services of the Operating Systems, Information Management, Process Management, Memory Management, Uses of System Calls, Portability, User's View of the Operating System, GUI, Operating System Structure (Monolithic (Simple) Operating System, Layered Operating System, Microkernel Operating System, Exokernel Operating system), Virtual Machine, Booting
- **Information ManagementL** Disk Basics, Direct Memory Access (DMA); File System (Block and Block numbering Scheme, File Support Levels, Writing/Reading a Record, Relationship between the Operating System and DMS, File Directory Entry, Open/Close Operations, Disk Space Allocation Methods, Directory Structure: User's View, Implementation of a Directory System); Device Driver (DD) (Basics, Path Management, Submodules of DD, I/O Procedure, I/O Scheduler, Device Handler, Interrupt Service

Routine (ISR), Complete Picture); Terminal I/O(Terminal Hardware, Terminal Software); CD-ROM, Organizing Data on the CD-ROM, DVD-ROM

- **Process Management:** Process, Evolution of Multiprogramming, Context Switching, Process States, Process State Transitions, Process Control Block (PCB), Process Hierarchy, Operation on a Process, Create/ Kill/ Dispatch a Process, Change the Priority of a Process, Block / Time Up /Wake Up a Process, Suspend/ Resume Operations, Process Scheduling (Objectives, Concepts of Priority and Time Slice, Scheduling philosophies, Scheduling Levels, Scheduling Policies (For Short Term scheduling)), Multithreading (Models, Implementation of Threads)
- **Inter Process Communication:** The Producer-Consumer Problems, Solutions to the Producer-Consumer Problems (Interrupt Disabling/Enabling, Lock-flag, Primitives for Mutual Exclusion, Implementation of Mutual Exclusion Primitives, Alternating Policy, Peterson's Algorithm, Hardware Assistance, Semaphores), Classical IPC problems (Algorithm, Monitors, Message Passing)
- **Deadlocks:** Graphical Representation of a Deadlock, Deadlock Prerequisites, Deadlock Strategies (Ignore a Deadlock, Detect a Deadlock, Recover from a Deadlock, Prevent a Deadlock, Avoid a Deadlock)
- **Memory Management:** Single Contiguous Memory Management, Fixed Partitioned Memory Management , Variable Partitions (Allocation Algorithms, Swapping, Relocation and Address Translation, Protection and Sharing, Evaluation), Non-Contiguous Allocation –General Concepts, Paging (Allocation Algorithms, Swapping, Relocation and Address Translation), Segmentation (Swapping, Address Translation and Relocation, Sharing and Protection), Combined Systems, Virtual Memory Management Systems (Relocation and Address Translation, Swapping, Relocation and Address Translation, Protection and Sharing, Evaluation, Design Consideration for Virtual Systems)

CMP256	Oracle

- **Architecture:** An Introduction to RDBMS, Architecture of Oracle DBMS, Data Modeling and Normalization, SGA And Client Server Architecture, Oracle Objects, Securities in Oracle
- **SQL:** What is SQL, Types of SQL statements, SQL SELECT Statement, FROM and WHERE Clauses, Operators Used in SQL, SELECT-GROUP By, Order By and Like
- **Transaction Handling:** Create Table, Data types, Updating Tables, Drop Rename and Alter, Transactions
- **SQLPlus:** Introduction, Formatting SQLPlus Reports
- **Data Aggregation:** Group Functions, Aggregating Results with Different Clauses, SQL Joins, Nested Queries, Non correlated and correlated subqueries, Operators in nested queries, Set Operators
- **Pseudo columns, Views & Sequences**
- **Integrity Constraints**
- **PL-SQL:** Introduction, PL-SQL Block Structure, Variables Constants and Comments, PL-SQL DataTypes, Records
- **Loops:** IF Statement, CASE Statement, Sequential Statements, Loop Control, Arrays
- **Cursors:** Creating and Using Cursors, Cursor Attributes, FOR Loop and Parameterized Cursors
- **Exception Handling**
- **Stored Subprograms:** Stored Subprograms, Stored Procedures, Stored Functions, Parameters and OverLoading, Packages
- **Triggers:** Triggers. DML Triggers, Database Event Triggers

CMP262	Study Skills

- **Organize Yourself:** Planning to study, Workplace readiness and ambience, Goal setting and motivation, Study habits, Managing resources, Time management, Nature and importance of study skills.
- **Observation and perceiving Skills:** Nature and importance of observing and perceiving, The Observation process,

Distortions in observing and perceiving, Improving observation skills

- **Listening Skills:** Nature and importance of listening, Listening and hearing, Listening methods, Effective listening, Problems related to listening, Towards effective listening.
- **Reading Skills:** Nature and importance of reading, Forms of reading, Reading methods, Reading speed, Problems related to reading, Towards effective reading.
- **Writing Skills:** Nature and importance of writing, Types of writing, Writing methods, Problems related to writing, Towards effective writing
- **Referencing Skills:** Importance and application, Learning Resources, Purposive accessing, Problems in referencing, Towards effective referencing
- **Examination Techniques:** Types of Examinations, Memory and retention, preparing for examination (Planning and scheduling, Time management, Practice and revision etc), Preparation stages: Prior to examination, During Examination, After Examination, Facing examinations effectively