



**SUBJECT: Counselling Schedules for Academic year 2020-2021**

**School Of Computer Science  
B.C.A [P131]**

Modes employed by the institution to provide academic counselling for theory courses	<ul style="list-style-type: none"><li>• Face to Face Counselling</li><li>• Laboratory Based Counselling</li><li>• Seminar</li><li>• Video Lectures/Audio Lectures</li><li>• Open Educational Resources</li></ul>
Modes employed by the institution to provide academic counselling for practical courses	<ul style="list-style-type: none"><li>• Face to Face Counselling</li><li>• Laboratory Based Counselling</li><li>• Open Educational Resources</li><li>• Case Studies</li></ul>

**Note:**

- Each counselling session/ practical session is of 2 hours duration.
- While preparing the Counselling Schedule/ Lab Schedule the university has specified the topics for the counselling sessions/ Lab Sessions and the month in which the sessions to be conducted.
- The freedom is provided to the Study Centers/Learners to decide the day and time of the counselling sessions/ lab sessions as per the mutual convenience. [Some SCs conduct the counselling sessions/ lab sessions on week days while some on week-ends
- The audio and video contents produced by the University have been kept on university YouTube channel. Learner has flexibility to listen/view the content as per his/her convenience.
- The SCs/Counsellors use educational resources available on web in counselling sessions as and when appropriate.
- The SCs/Counsellors recommends learners to self study certain topics using web resources /text books/reference books.

Name of Programme	Bachelor of Computer Applications (BCA)
Programme Code	P131
Level of Programme	Degree
Year	First Year
Semester	1 <sup>st</sup> Semester

English Communication (AEC001) [Theory]

Counselling Session	Month	Topic
1	July	Unit 1: Introduction
2	July	Unit 1: Language of Communication
3	July	Unit 1: Speaking Skills
4	July	Unit 2: Understanding the Basis of Verbal Communication
5	July	Unit 2: Working with Customers
6	August	Unit 2: Developing Professional Telephone Skills
7	August	Unit 2: Improving Informal Communication
8	August	Unit 3: Reading and Understanding
9	August	Unit 3: Writing Skills
10	August	Unit 3: Uncovering the Secrets of Clear writing
11	August	Unit 3: Communicating with E-Mail and Memos, Writing for Employment
12	August	Unit 4: Developing Reports
13	September	Unit 4: Planning a Report or Proposals
14	September	Unit 4: Writing Proposals
15	October	Unit 5: Solving the Problem
16	October	Unit 5: Identifying and Defining Problems
17	October	Unit 5: Solving the Problem
18	October	Unit 6: Working in Groups and Teams
19	October	Unit 6: Group Decision Making and Problem Solving
20	October	Unit 6: Exploring Team Roles and Processes
21	November	Unit 6: Building and Developing Teams
22	November	Unit 7: Thinking Critically
23	November	Unit 7: Assessing the Credibility of an Argument
24	November	Unit 7: Becoming a Critical Thinker
25	December	Unit 8: Presenting yourself Professionally
26	December	Unit 8: Developing Your Interpersonal Skills - I
27	December	Unit 8: Developing Your Interpersonal Skills - II
28	December	Revision
29	December	Revision
30	December	Revision for Theory Exam

Mathematics (CMP501) [Theory]

Counselling Session	Month	Topic
1	July	Unit 1: Set Theory - I
2	July	Unit 1: Set Theory - II

3	July	Unit 1: Number Systems - I
4	July	Unit 1: Number Systems - II
5	July	Unit 2: Mathematical Induction - I
6	August	Unit 2: Mathematical Induction - II
7	August	Unit 2: Mathematical Logic - I
8	August	Unit 2: Mathematical Logic - II
9	August	Unit 3: Exponents
10	August	Unit 3: Surds
11	August	Unit 3: Logarithms - I
12	August	Unit 3: Logarithms - II
13	September	Unit 4: Addition Principle
14	September	Unit 4: Multiplication Principle
15	October	Unit 4: Factorial of Number
16	October	Unit 4: Permutations and Combinations
17	October	Unit 5: Relations - I
18	October	Unit 5: Relations - II
19	October	Unit 5: Functions - III
20	October	Unit 5 Functions - IV
21	November	Unit 6 Vectors - I
22	November	Unit 6 Vectors - II
23	November	Unit 6 Matrices
24	November	Unit 6 Determinants
25	December	Unit 7 Linear Equations
26	December	Unit 7 Polynomials
27	December	Unit 7 Graph Theory
28	December	Unit 8 Mensuration
29	December	Revision
30	December	Revision for Theory Exam

Problem Solving using Computers (CMP502) [Theory]

Counselling Session	Month	Topic
1	July	Unit 1: Introduction to Computer
2	July	Unit 1: Basic Computer Organization – I
3	July	Unit 1: Basic Computer Organization -II
4	July	Unit 2: Techniques of Problem Solving
5	July	Unit 2: Program design
6	August	Unit 2: Flowcharting
7	August	Unit 3: Planning the Computer Program
8	August	Unit 3: Program Debugging,
9	August	Unit 4: Introduction to C, History of 'C'
10	August	Unit 4: C Basics
11	August	Unit 4: Formatted input, formatted output instructions
12	August	Unit 5: Decision Making and looping
13	September	Unit 5: If-Else
14	September	Unit 5: Switch Case
15	October	Unit 5: Do While
16	October	Unit 5: For Loop
17	October	Unit 6: Arrays and Strings

18	October	Unit 6: Two Dimensional and character arrays
19	October	Unit 6: Declaration and initialization of string variables
20	October	Unit 6: String handling functions
21	November	Unit 7: Functions and Pointers
22	November	Unit 7: Need of Functions
23	November	Unit 7: Understanding pointers
24	November	Unit 7: Pointers arithmetic
25	December	Unit 8: Structures and Unions
26	December	Unit 8: Unions
27	December	Revision
28	December	Revision
29	December	Revision
30	December	Revision for Theory Exam

### Programming using C++ (CMP503) [Theory]

Counselling Session	Month	Topic
1	July	Unit 1: Introduction
2	July	Unit 1: Object-Oriented Programming
3	July	Unit 1: Control Structure
4	July	Unit 2: Classes Objects
5	July	Unit 2: Functions in C++
6	August	Unit 2: Classes and Objects - I
7	August	Unit 2: Classes and Objects - II
8	August	Unit 3: Constructors, Destructors and Operator Overloading
9	August	Unit 3: Constructors, Destructors
10	August	Unit 3: Operator Overloading
11	August	Unit 3: Type Conversion
12	August	Unit 4: Extending Classes
13	September	Unit 4: Inheritance
14	September	Unit 4: Multilevel Inheritance
15	October	Unit 4: Classes
16	October	Unit 5: Pointers, Virtual Functions
17	October	Unit 5: Polymorphism
18	October	Unit 5: Virtual Functions
19	October	Unit 6: Managing Console I/O Operations
20	October	Unit 6: I/O Operations
21	November	Unit 6: Working with Files
22	November	Unit 7: Exception Handling
23	November	Unit 7: Constructors & Destructors
24	November	Unit 8: Templates
25	December	Unit 8: Functions Templates
26	December	Unit 8: Templates and Standard Template Library
27	December	Revision
28	December	Revision
29	December	Revision
30	December	Revision for Theory Exam



LAB: Mathematics (CMP701) [Practical]

Practical Session	Month	Topic
1	July	Set Theory- Set operations
2	July	Mathematical Induction
3	August	Exponents, Logarithms, Surds
4	August	Number Systems, Binary Addition and Subtraction
5	August	Permutations and Combinations
6	September	Mathematical Logic
7	September	Relations
8	October	Functions
9	October	Vectors
10	October	Matrices and Determinants
11	November	Mensuration
12	November	System of Linear Equations
13	November	Polynomials and Quadratic Equations
14	December	Graph Theory
15	December	Miscellaneous

LAB: Problem Solving Using Computers (CMP702) [Practical]

Practical Session	Month	Topic
1	July	Flowchart and Algorithm
2	July	if statement, Conditional operator
3	August	Switch statement
4	August	For loop
5	August	do-while / while-do loop
6	September	if-else ladder/nested if
7	September	Menu driven program
8	October	Functions
9	October	Functions and Recursion
10	October	One Dimensional Array
11	November	Two Dimensional Arrays
12	November	Array of structures
13	November	Pointers
14	December	File Handling
15	December	Mini Project

Lab: Programming using C++ (CMP703) [Practical]

Practical Session	Month	Topic
1	July	Write a C++ program to declare two integer , one float variables and assign 10, 15, and 12.6 to them respectively and then prints these values on the screen.
2	July	Write a C++ program to prompt the user to input her/his name and print this name on the screen, as shown below. The text from keyboard can be read by using cin>> and to display the text on the screen you can use

		cout<<.
3	August	Write a C++ program that prompts the user to input three integer values and find the greatest value of the three values.
4	August	Write a program that determines a student's grade. The program will read three types of scores (quiz, mid-term, and final scores) and determine the grade based on the following rules: -if the average score =90% =>grade=A -if the average score >= 70% and <90% => grade=B -if the average score >=50% and <70% =>grade=C -if the average score <50% =>grade=F
5	August	Define a class called as circle which has radius as its data member. The class should have following member functions a. Function to set the value of radius b. Function to get the value of radius c. Function to calculate and return the area of circle d. Function to calculate and return circumference
6	September	Develop a class to represent one digit counter. The class must have data member to represent counter. The class should have following function a. Function to set the value of the counter b. Function to display value of the counter c. Function to increment the counter d. Function to decrement the counter
7	September	Define a class called as distance represented in feet and inches. The class should have following member function a. Function to set the distance b. Function to get the distance from user c. Function to display the distance d. Function to add two distances and return the addition
8	October	Define a class Period which has hours and minutes as its data member. Function add to add the periods and return the addition. The function should work as Friend Function.
9	October	<ul style="list-style-type: none"> <li>• Create a class to demonstrate use of constructor</li> <li>• Write a program to demonstrate use of copy constructor</li> </ul>
10	October	<ul style="list-style-type: none"> <li>• Define a class that has following data member functions              a. Inc, dec, display              b. Constructor with default parameter zero              c. Destructor function</li> <li>• Define a class to overload unary ++ and unary -- operator</li> </ul>
11	November	<ul style="list-style-type: none"> <li>• Define a class complex to represent complex number. The class should have constructor with 2 default parameters. Create member function setcomplex( ), getcomplex( ) and display( ) and also operator functions to overload +, -, *, / for carrying out operation with complex number</li> </ul>
12	November	Design a class for multilevel inheritance using public and private derivation
13	November	Write a program to demonstrate the concept of method overriding, virtual function.
14	December	Design a class FileDemo, open the file in read mode and display the total number of line, word and characters
15	December	Show the implementation of template class library for swap function

**B.C.A[P131]**

Name of Programme	Bachelor of Computer Applications (BCA)
Programme Code	P131
Level of Programme	Degree
Year	First Year
Semester	2 <sup>nd</sup> Semester

**Environmental Studies (ENV121) [Theory]**

Counselling Session	Month	Topic
1	January	Unit 1: Multidisciplinary Nature of Environmental Studies –I
2	January	Unit 1: Multidisciplinary Nature of Environmental Studies - II
3	February	Unit 2: Natural Resources - I
4	February	Unit 2: Natural Resources - II
5	February	Unit 2 : Natural Resources - III
6	February	Unit 2 : Natural Resources - IV
7	February	Unit 3: Ecosystems - I
8	February	Unit 3: Ecosystems - II
9	February	Unit 3: Ecosystems - III
10	February	Unit 3: Ecosystems - IV
11	March	Unit 4: Biodiversity and its Conservation - I
12	March	Unit 4: Biodiversity and its Conservation - II
13	March	Unit 4: Biodiversity and its Conservation - III
14	March	Unit 4: Biodiversity and its Conservation - IV
15	March	Unit 5: Environmental Pollution - I
16	March	Unit 5: Environmental Pollution - II
17	March	Unit 5: Environmental Pollution - III
18	March	Unit 5: Environmental Pollution - IV
19	April	Unit 6: Social Issues and the Environment - I
20	April	Unit 6: Social Issues and the Environment - II
21	April	Unit 6: Social Issues and the Environment - III
22	April	Unit 6: Social Issues And the Environment - IV
23	April	Unit 7: Human Population and the Environment - I
24	April	Unit 7: Human Population and the Environment - II
25	April	Unit 7: Human Population and the Environment - III
26	April	Unit 7: Human Population and the Environment - IV
27	May	Unit 8: Field Work - I
28	May	Unit 8: Field Work - II
29	May	Revision
30	May	Revision

**Statistics (CMP504) [Theory]**

Counselling Session	Month	Topic
1	January	Unit 1: Definition of Statistics, Scales and Measurements, Scope and Importance of Statistics, Limitations of Statistics, Representation of Data, Classification of Data

2	January	Unit 1: Cumulative Frequency Distribution and Curve, Pie Chart, Bar Diagram, Histogram, Frequency Polygon and line graph
3	February	Unit 2: Mean and Median
4	February	Unit 2: Mode
5	February	Unit 2: Other Averages
6	February	Unit 3: Range, Standard Deviation, Merits and Demerits of Standard Deviation
7	February	Unit 3: Formula for Combined Standard Deviation (without proof), Interpretation of Standard Deviation, Coefficient of Variation
8	February	Unit 4: Moments, Skewness and Kurtosis
9	February	Unit 4: Numerical Example
10	February	Unit 5: Scatter Diagram, Karl Pearson's Correlation Coefficient and its properties
11	March	Unit 5: Applications of Correlation in Various Fields, Spearman's Rank Correlation Coefficient
12	March	Unit 5: Linear Regression (Bivariate data)
13	March	Unit 6: Random Experiments, Probability
14	March	Unit 6: Relative Frequency Approach of Determining Probability, Equally Likely Approach, Axioms of Probability
15	March	Unit 6: Conditional Probability, Multiplicative Law, Baye's Theorem
16	March	Unit 6: Concept of Independence, Counting Techniques
17	March	Unit 7: Random Variables, Discrete Random Variable
18	March	Unit 7: Continuous Random Variable
19	April	Unit 7: Probability Distribution
20	April	Unit 7: Some Special Continuous Probability Distributions
21	April	Unit 7: Sampling Distributions
22	April	Unit 8: Statistical Hypothesis, Null Hypothesis and Alternative Hypothesis, Test of a Statistical Hypothesis
23	April	Unit 8: Level of Significances
24	April	Unit 8: Large Sample Tests, Small Sample Tests, Test for Population Mean, Test for Equality of Two Population Means
25	April	Unit 8: Test of Variances
26	April	Unit 8: Test based on Chi-Square Distribution
27	May	Revision
28	May	Revision
29	May	Revision
30	May	Revision for Theory Exam

Data structure using C ++ (CMP505)

[Theory]

Counselling Session	Month	Topic
1	January	Unit 1: Basic Terminology (Elementary data structure organization, Classification of data structure, Operations on data structures (Traversing, Inserting, deleting, Searching, sorting, merging))
2	January	Unit 1: Different Approaches to designing an algorithm (Top-Down approach, Bottom-up approach)
3	February	Unit 1: Complexity (Time complexity, Space complexity), Asymptotic Notations (O Notation, $\Omega$ Notation, $\theta$ Notation)
4	February	Unit 2: Sorting Techniques(Introduction, Selection sort, Insertion sort,



		Bubble sort)
5	February	Unit 2: Sorting Techniques (Merge sort, Radix sort, Shell sort, Quick sort) (Only algorithm)
6	February	Unit 2: Searching (Linear search, Binary search)
7	February	Unit 3: Introduction to stack (Stack as an abstract data type, Representation of stack through arrays), Applications of Stack (Reversing a list, Polish notations)
8	February	Unit 3: Applications of Stack (Conversion of infix to postfix expression, Evaluation of postfix expression, Converting an infix into prefix expression, Evaluation of prefix expression, Recursion)
9	February	Unit 4: Introduction (Queues as an abstract data type, Representation of a Queue as an array)
10	February	Unit 4: Types of Queue (Circular Queue, Double Ended Queue, Priority Queue, Dequeues)
11	March	Unit 4: Applications of Queue
12	March	Unit 5: Introduction (Terminologies: node, Address, Pointer, Information, Next, Null Pointer, Empty list etc.)
13	March	Unit 5: Type of lists (Linear list, Circular list, Doubly list)
14	March	Unit 5: Operations on a singly linked list (Traversing a singly linked list, Searching a linked list) ( only algorithm)
15	March	Unit 5: Operations on a singly linked list (Inserting a new node in a linked list, Deleting a node from a linked list) (only algorithm)
16	March	Unit 6: Introduction (tree ,degree of a node, degree of a tree, level of a node, leaf node, Depth / Height of a tree, In-degree & out-Degree, Directed edge, Path, Ancestor & descendant nodes)
17	March	Unit 6: Tree Types and Traversal Methods (Type of Trees, General tree)
18	March	Unit 6: Tree Types and Traversal Methods (Binary tree, Binary search tree (BST))
19	April	Unit 6: Binary tree traversal (In order traversal, Pre order traversal, Post order traversal)( only algorithm )
20	April	Unit 6: Expression tree
21	April	Unit 7: Introduction (graph, node (Vertices), arcs (edge), directed graph, in-degree, out-degree, adjacent, successor, predecessor, relation, weight, path, length)
22	April	Unit 7: Representations of a graph (Array Representation, Linked list Representation)
23	April	Unit 7: Traversal of graphs (Depth-first search (DFS). Breadth-first search (BFS))
24	April	Unit 7: Applications of Graph
25	April	Unit 8: Hash function
26	April	Unit 8: Collision resolution techniques
27	May	Revision
28	May	Revision
29	May	Revision
30	May	Revision for Theory Exam

Counselling Session	Month	Topic
1	January	Unit 1: Fundamentals of Computer Network (Definition Need of Computer Network, Applications, Component of Computer Network), Network Benefits [Sharing Information(File Sharing, E-mail), Sharing Resources (Printer Sharing, Application Services), Facilitating Centralized Management (Managing Software)], Maintaining the Network, Backing up data
2	January	Unit 1: Computer Network Classifications, Classification of Network by their Geography (PAN, CAN, LAN, MAN, WAN)
3	February	Unit 1: Classification of Network by their Component Role (Peer-to-Peer Network, Server-Based Network, Types of server)
4	February	Unit 2 : Network Topologies & Networking Devices Network Topologies (Introduction, Definition, Selection Criteria), Types of Topology (Bus, Ring, Star, Mesh, Tree, Hybrid)
5	February	Unit 2 : Network Control / Connecting Devices (Need of Network Control devices, Role of Network Control devices in a Network, Connectors, Hub, Repeater, Bridges, Switches, Router, Gateway, Modem.)
6	February	Unit 2: Network software, NIC Device Driver, client-server software e.g. DHCP, TELNET, FTP
7	February	Unit 3: Need of Transmission Media, Selection Criteria, Types of Transmission Media, Guided Media (Cable Characteristics, Types of Cable-Twisted Pair Cable, Co-axial Cable, Fibre Optic Cable), Unguided media (Types of Communication Band-Microwave Communication, Radio wave)
8	February	Unit 3: Communication, Satellite and Infrared Communication, Latest Technologies in Wireless Network, Bluetooth Architecture, Wi-Fi, Wi- Max
9	February	Unit 3: Cellular (Mobile) Telephone – Band in Cellular Telephony, Calls using Mobile Phones, Transmitting receiving / Handoff operations
10	February	Unit 4: Layered Architecture, Peer-to- Peer Processes Interfaces between Layer, Organization of the Layers
11	March	Unit 4: Protocols
12	March	Unit 4: Encapsulation
13	March	Unit 5: Layers of the OSI Reference Model
14	March	Unit 5: Physical and Data-Link Layer
15	March	Unit 5: Network and Transport Layer
16	March	Unit 5: Session, Presentation and Application Layer - I
17	March	Unit 5: Session, Presentation and Application Layer - II
18	March	Unit 6: Addressing mechanism in the Internet, IP Addressing (IP Address classes, classless IP addressing, Subnetting, supernetting, Masking)
19	April	Unit 6: Layered Structure of the TCP / IP Model (Host-to-Network, Internet, Transport, Application), TCP / IP Protocol Suite: Host-to-Network-SLIP and PPP, Internet Layer-ARP, RARP and IP: Introduction, IPv4, IPv6 (Header Format), Difference between IPv4 & IPv6

20	April	Unit 6: Transport Layer (TCP and UDP (Frame Format, port addresses)), Application Layer (FTP, SMTP, DNS), Comparison between OSI and TCP/IP Model
21	April	Unit 7: Introduction to Computer Security, Need for security, Security basics (Confidentiality, Integrity, Availability, Accountability, Non-repudiation)
22	April	Unit 7: Threats to Security (Viruses (its types) and Worms, Intruders, Insiders, Criminal organizations, Terrorists, Information warfare Avenues of attack, Steps in attack), Security Attacks (Active and Passive attacks, Types of attack)
23	April	Unit 7: Password Management, Role of people in Security: Do's and Don'ts
24	April	Unit 8: Cryptography, Cryptanalysis, Cryptology, Substitution techniques (Caesar's cipher, monoalphabetic and polyalphabetic, one-time pad), Transposition techniques (Rail fence technique, simple columnar)
25	April	Unit 8: Hashing – concept, Firewalls (Introduction, Why Firewall, features, advantages and disadvantages. Types of Firewall), Virtual Private Network work
26	April	Unit 8: Security topologies (security zones, DMZ, Internet, Intranet, VLAN), Intrusion Detection (Intrusion detection systems (IDS), host based IDS, network based IDS)
27	May	Revision
28	May	Revision
29	May	Revision
30	May	Revision for Theory Exam

LAB: Statistics (CMP704)

[Practical]

Practical Session	Month	Topic
1	January	Classification and tabulation of data, Frequency Distribution
2	January	Graphical representation of data Part I
3	February	Graphical representation of data Part II
4	February	Measures of Central Tendency
5	February	Measures of Dispersion Part I
6	March	Measures of Dispersion Part II
7	March	Moments & Measures of Skewness and Kurtosis Part I
8	March	Moments & Measures of Skewness and Kurtosis Part II
9	March	Correlation and Regression- Part I
10	April	Correlation and Regression- Part II
11	April	Probability Part I
12	April	Probability Part II
13	April	Random Variables, Special Continuous Probability Distributions
14	May	Test of Hypothesis, Large Sample Tests, Small Sample Tests- Part I
15	May	Test of Hypothesis, Large Sample Tests, Small Sample Tests- Part II



## Lab: Data structure using C++ (CMP705)

[Practical]

Practical Session	Month	Topic
1	January	Array
2	January	Sorting Techniques
3	February	Searching Technique
4	February	Array
5	February	Array
6	March	Sparse Matrix
7	March	Stack
8	March	Stack
9	March	Queue
10	April	Linked List
11	April	Linked List
12	April	Tree
13	April	Tree
14	May	Graph
15	May	Graph

## Lab: Computer Networks (CMP706)

[Practical]

Practical Session	Month	Topic
1	January	Observe, Identify and Know the Use of Network Components in Computer Network Lab
2	January	Observe, Identify and Know the Use of Network Features.
3	February	Observe, Identify and Know the Use of Transmission Media and Network Control devices.
4	February	Connecting two PC's by fabricating Straight Cable and Network Cross over Cable
5	February	Install Network Interface Card with proper driver software to locate MAC address of Computer
6	March	Connect Computers in Star Topology using Wired Media and any Network control Device.
7	March	Configure Peer-to-Peer Network
8	March	Use of Sharing Printers and Folders in a Network
9	March	Installing TCP/IP Protocols (Version 4 and version 6) and configure advanced features of TCP/IP Protocols
10	April	Installing Wireshark software and configure it to capture Ethernet packet
11	April	Execute Basic TCP/IP Utilities and Network Commands with all options
12	April	Observe, Identify and Know the Use of Subnet Masking and create two subnets
13	April	Working with network simulators (Cisco Packet Tracer) Working with wireless devices. (Installing & Configuring)
14	May	Configuring the firewall with existing network / New network and Firewall services
15	May	remote connectivity sessions (Team viewer, ammyadmin etc..) and sharing of network resources (Printer, fax etc..)



## B.C.A[P131]

Name of Programme	Bachelor of Computer Application
Programme Code	P131
Level of Programme	Under Graduate
Year	Second Year
Semester	3 <sup>rd</sup> Semester

### IT and E-Learning Skills (ICT151) [Theory]

Counselling Session	Month	Topic
1	July	Unit 1: Observations, reading
2	July	Unit 1: writing, thinking, Verbal Communication
3	July	Unit 2: ICT, Flip Classrooms, Virtual laboratories
4	July	Unit 2: Blended Learning, Collaborative Learning, LMS
5	July	Unit 2: OERs, MOOC, Mobile learning
6	August	Unit 2: Machine assessment and feedback, Self and Peer assessment
7	August	Unit 3: Wordprocessing
8	August	Unit 3: Spreadsheet
9	August	Unit 3: Presentation softwares
10	August	Unit 3: Utilities
11	August	Unit 4: e-mail
12	August	Unit 4: Search Engines
13	September	Unit 4: Smart Phones
14	September	Unit 5: Searching the right Information on web
15	October	Unit 5: Using Social Media effectively
16	October	Unit 5: Blogs
17	October	Unit 5: Discussion Forums
18	October	Unit 5: Ethics and Etiquettes
19	October	Unit 6: Motivation
20	October	Unit 6: Evaluating effectiveness, Adaptability
21	November	Unit 6: Technical issues, Time Management
22	November	Unit 7: Threats
23	November	Unit 7: Desktop and mobile security
24	November	Unit 7: Cyber Security
25	December	Unit 8: MOOC
26	December	Unit 8: Open Educational resources, Mobile apps
27	December	Revision
28	December	Revision
29	December	Revision
30	December	Revision for Theory Exam

Counselling Session	Month	Topic
1	July	Unit 1: Introduction(What is OS, Important of OS, Features, Uses, Applications), Evolution of OS (proprietary, CP/M, DOS, UNIX, Windows and other, Command line to GUI, Portability, Client Server)
2	July	Unit 1: Types of Operating System (multiprogramming systems, batch systems , time sharing systems)
3	July	Unit 1: Types of Operating System(operating systems for personal computers and workstations, process control & real time systems), User's View of the Operating System
4	July	Unit 2: Different Services of the Operating Systems (Information Management, Process Management, Memory Management)
5	July	Unit 2: Uses of System Calls, Operating System Structure (Monolithic (Simple) Operating System, Layered Operating System, Microkernel Operating System, Exokernel Operating system)
6	August	Unit 2: Virtual Machine, Booting
7	August	Unit 3: Disk Basics, Direct Memory Access (DMA)
8	August	Unit 3: 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)
9	August	Unit 3: Device Driver (DD) (Basics, Path Management, Submodules of DD)
10	August	Unit 4: Process, Evolution of Multiprogramming, Context Switching
11	August	Unit 4: 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
12	August	Unit 4: Process Scheduling (Objectives, Concepts of Priority and Time Slice, Scheduling philosophies, Scheduling Levels, Scheduling Policies (For Short Term scheduling)), Multithreading (Models, Implementation of Threads)
13	September	Unit 5: The Producer-Consumer Problems, Solutions to the Producer-Consumer Problems (Interrupt Disabling/Enabling, Lock-flag)
14	September	Unit 5: What are Primitives for Mutual Exclusion?
15	October	Unit 5: Classical IPC problems
16	October	Unit 5: Semaphores
17	October	Unit 5: Alternating Policy
18	October	Unit 5: Peterson's Algorithm
19	October	Unit 6: I/O Procedure, I/O Scheduler, Device Handler, Interrupt Service Routine (ISR), Terminal I/O(Terminal Hardware, Terminal Software)
20	October	Unit 6: Organizing Data on the CD-ROM, DVD-ROM, Graphical Representation of a Deadlock
21	November	Unit 6: Deadlock Prerequisites, Deadlock Strategies (Ignore a Deadlock, Detect a Deadlock, Recover from a Deadlock, Prevent a Deadlock, Avoid a Deadlock)
22	November	Unit 7: Single Contiguous Memory Management, Fixed Partitioned

		Memory Management
23	November	Unit 7: 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)
24	November	Unit 7: Combined Systems, Virtual Memory Management Systems (Relocation and Address Translation, Swapping, Relocation and Address Translation, Protection and Sharing, Evaluation, Design Consideration for Virtual Systems)
25	December	Unit 8: Protection and Security Policy mechanism
26	December	Unit 8: Authentication, Internal access Authorization
27	December	Revision
28	December	Revision
29	December	Revision
30	December	Revision for Theory Exam

### Web Technologies (CMP508) [Theory]

Counselling Session	Month	Topic
1	July	Unit 1: History and Evolution, Web development cycle
2	July	Unit 1: Web publishing, Web contents
3	July	Unit 1: Dynamic Web contents
4	July	Unit 2: HTML, DHTML, XHTML
5	July	Unit 2: JSP, JavaScript
6	August	Unit 2: Features and Applications
7	August	Unit 3: HTML Fundamentals, HTML Browsers, HTML tags, Elements and Attributes, Structure of HTML code (Head, Body)
8	August	Unit 3: Lists (Ordered List, Unordered List, Definition List, Nesting List), Block Level Tags (Block formatting, Heading, Paragraph, Comments, Text, alignment, Font size), Text Level Tags (Bold, Italic, Underlined, Strikethrough, Subscript, superscript)
9	August	Unit 3: Inserting graphics (Scaling images, Frameset, Forms), An introduction to DHTML, DOM
10	August	Unit 4: The usefulness of style sheets, Types of Style sheets, Creating style sheets
11	August	Unit 4: Common tasks with CSS, Font Family (Font Metrics, Units, Properties)
12	August	Unit 4: Classes and Pseudo classes, CSS tags
13	September	Unit 5: What is Scripting Language, Client side and server side scripting
14	September	Unit 5: Types of scripting languages
15	October	Unit 6: Introduction, Operators, Assignments and Comparisons, Reserved words
16	October	Unit 6: Starting with JavaScript ( Writing first JavaScript program, Putting Comments) Functions
17	October	Unit 6: Statements in JavaScript
18	October	Unit 6: Working with objects: Object Types and Object Instantiation, Date object, Math Object, String object, Event object, Frame object,



		Screen object
19	October	Unit 6: Handling Events (Event handling attributes, Window Events, Form Events, Event Object, Event Simulation), Events- Keyboard & Mouse events
20	October	Unit 7: Introduction to XML, Anatomy of an XML document
21	November	Unit 7: Creating XML Documents
22	November	Unit 7: Creating XML DTDs, XML Schemas, XSL
23	November	Unit 8: Basic rules of Web Page design- I
24	November	Unit 8 :Basic rules of Web Page design - II
25	December	Unit 8: Types of Website - I
26	December	Unit 8: Types of Website - II
27	December	Revision
28	December	Revision
29	December	Revision
30	December	Revision for Theory Exam

Database Management System (CMP509) [Theory]

Counselling Session	Month	Topic
1	July	Unit 1: Data, Files, Operations on file
2	July	Unit 1: Introduction to Database -Definition of database, Entity
3	July	Unit 1: Attributes, Domain, Instance, Record/Tuple
4	July	Unit 2: Definition to DMBS, WHY DMBS, Services provided by DMBS (Transaction Management, Concurrency Control, Recovery Management, Security Management, Language Interface), Applications of DMBS
5	July	Unit 2: Differences between File System and DMBS, Drawbacks of File system, Abstraction Levels (Three Levels of Abstraction)
6	August	Unit 2: Database Users, DDL and DML, Structure of DMBS, Metadata
7	August	Unit 3: Introduction to DATA Models, Object-based Logical Models (E-R Model, Object-Oriented Model)
8	August	Unit 3: Record-based Logical Models (Relational Model, Network Model, Hierarchical Model)
9	August	Unit 3: Physical Data Models
10	August	Unit 4: Overview, Modelling, Basic styles of data model, ER Model, Components of ER Model ( Entity, Attributes, Entity Set, Domain), Entity Types (weak entity, Strong Entity, Recursive Entity, Composite Entities), Attributes Types (Simple, Composite, Single Valued, Multi Valued, Stored, Derived, Complex, Null Attributes)
11	August	Unit 4: Relation , Relationship (Relationship set, Connectivity in relationship), Types of Relationship (Unary, Binary, Ternary), Classifying Relationship (Degree of Relationship, Multiplicity, Existence), Mapping Cardinalities (One to One, One to Many, Many to One, Many to Many, Keys, Keys for Relationship set (Super key, Candidate key, Secondary key, Compound key, Alternate key, Primary key, Foreign key)
12	August	Unit 4: E-R Diagrams – E-R Modelling Symbols, Cardinality Constraints related to E-R diagrams, Alternative Notations for cardinality limits, Weak Entity sets, Case Studies on E-R diagrams



13	September	Unit 5: Normalizations Overview, Relational DB design, Decomposition (Small schema)
14	September	Unit 5: Lossy Decomposition, Loss less Decomposition, Functional Dependency (Full Dependency, Partial Dependency, Transitive Dependency)
15	October	Unit 5: Normalized Forms (Un – Normalized form, 1NF, 2NF, 3NF), De-normalization
16	October	Unit 6: Introduction, SQL Statements (DML, DDL, DCL), Data Types in SQL, Basic Types structure
17	October	Unit6: SELECT- SQL SELECT DISTINCT Statement, SQL Where Clause, And, OR, In, Between, Like Operator, SQL Order by Keyword, Aggregate Functions, Group By, Having Clause.
18	October	Unit 6: CREATE – DROP TABLE, Constraints, INSERT, UPDATE, DELETE, ALTER, DATA Control Language (DCL)
19	October	Unit 6: Different operations on tables – Rename, Tuple Variables, Set Operations(UNION Operator, UNION ALL Operator, INTERSECT Operator, Minus Operator), String Operations, Null Values
20	October	Unit 7: Transaction Management Introduction, Transaction Concept, Properties of Transactions, Transaction Terminology
21	November	Unit 7: Transaction States, Concurrent Execution of Transactions, Operations on a Transactions
22	November	Unit 7: Concurrency Control, Schedules, Recoverability
23	November	Unit 8: Introduction to PL/SQL, The Advantages of PL/SQL, PL/SQL Architecture
24	November	Unit 8: PL/SQL Data types, Variable and Constants, Using Built_in Functions, Conditional and Unconditional Statements, Simple if, if... else, nested if..else, if..else Ladder
25	December	Unit 8: Selection Case, Simple Case, GOTO Label and EXIT, Iterations in PL/SQL
26	December	Unit 8: Procedures in PL/SQL, EXCEPTIONS in PL/SQL, Database Triggers in PL/SQL, File Input/Output
27	December	Revision
28	December	Revision
29	December	Revision
30	December	Revision for Theory Exam

Lab: Operating System (CMP707) [Practical]

Practical Session	Month	Topic
1	July	DOS commands
2	July	Batch file
3	August	UNIX Commands
4	August	File access permissions(Read/ Write /Execute/ chmodcommand)
5	August	File processing commands(CAT/ join/sort/paste/compare/word count /grep command )
6	September	File / folder sharing in windows
7	September	Windows Control panel 1 –
8	October	Windows Control panel 2
9	October	Demonstration of Task Manager

10	October	Demonstration of computer manage tool
11	November	Numerical on process scheduling
12	November	Numerical on memory management (Best Fit/ worst fit )
13	November	Numerical on paging and segmentation
14	December	Simulation 1
15	December	Simulation 2

Lab: Web Technologies (CMP708) [Practical]

Practical Session	Month	Topic
1	July	Design a web page using different text formatting tags.
2	July	Design a web page with different types of Marquee.
3	August	Design a web page with links to different pages and allow navigation between pages.
4	August	Design a web page with Image and Image maps.
5	August	Create a student table with the following fields. Student Id, Name, DOB, Course, Address, E-mail id and apply Embedded cascading style sheet CSS with the following attributes:Font size, color, style, bold, italic, border color, set the background image & set the center align of table & text.
6	September	Create an external CSS for above and apply to the web page.
7	September	Create a frameset that divides browser window into horizontal and vertical framesets.
8	October	Write the javascript code to enter five numbers in the prompt box. Calculate addition of the numbers & average.
9	October	Create a web page with image and text apply javascript Mouse events – onmouseover , onmouseout, onclick on the image and text
10	October	Create a page which displays Javascript popupboxes : Alert , Confirm , Prompt.
11	November	Design a form and validate all the controls placed on the form using Java Script.
12	November	Design a DTD, corresponding XML document and display it in browser using CSS.
13	November	Design an XML document and display it in browser using XSL
14	December	Design XML Schema and corresponding XML document
15	December	Create a web site with Minimum 3 pages: Home, Page 1 and Page2. Incorporate all HTML & DHTML elements. The pages should be linked.

Lab: Database Management System (CMP709) [Practical]

Practical Session	Month	Topic
1	July	To draw ER Model and Relational Model for a given database.
2	July	Create one-to-many Relationship between Manager and Employee Relations Create following Relations with the given fields
3	August	Determine the functional dependencies. Remove partial dependency and transitive dependencies in given table. ( i.e. convert it into 3NF)
4	August	Creation of Database and table-DDL COMMAND
5	August	Simple SQL Query-1-DML COMMAND

6	September	Simple SQL Query2: SQL Functions
7	September	Advanced SQL queries using Set Operations
8	October	Advanced SQL queries using Sub query
9	October	Advanced SQL queries using JOINS
10	October	Advanced SQL queries using PL-SQL
11	November	Advanced SQL queries usingPROCEDURE AND FUNCTION
12	November	Write a pl/sql program to find the total and average of 6 subjects and display the grade
13	November	Write a procedure to calculate total for the all the students and pass regno, mark1, & mark2 as arguments
14	December	Write a procedure raise_sal which increases the salary of an employee. It accepts an employee number and salary increase amount. It uses the employee number to find the current salary from the EMPLOYEE table and update the salary
15	December	Simple SQL Query

ज्ञानगंगा घरोघरी

## B.C.A[P131]

Name of Programme	Bachelor of Computer Application
Programme Code	P131
Level of Programme	Under Graduate
Year	Second Year
Semester	4 <sup>th</sup> Semester

### Financial and Investment Skills (OPN272) [Theory]

Counselling Session	Month	Topic
1	January	Unit 1: The Need to Invest
2	January	Unit 1: Regulators
3	February	Unit 1: Financial Intermediaries , The IPO Markets
4	February	Unit 2: The Stock Markets , The Stock Markets Index
5	February	Unit 2: Commonly Used Jargons , The Trading Terminal
6	February	Unit 3: Clearing and Settlement Process, Five Corporate Actions and Its Impact on Stock Prices
7	February	Unit 3: Key Events and Their Impact on Markets, Getting started!
8	February	Unit 4: Introduction to Fundamental Analysis
9	February	Unit 4: Mindset of an Investor
10	February	Unit 4: How to Read the Annual Report of a Company
11	March	Unit 5: Understanding the P&L Statement , Understanding Balance Sheet Statement
12	March	Unit 5: Cash Flow statement, Financial Ratio Analysis
13	March	Unit 6: Research, Discounted The Investment Due Diligence
14	March	Unit 6: Equity Cash Flow (DCF) and Time Value of Money, The follies of DCF Analysis
15	March	Unit 6: Margin of Safety, When to sell? How many stocks in the portfolio?
16	March	Unit 7: Background, Introducing Technical Analysis
17	March	Unit 7: The Chart Types, Getting Started with Candlesticks
18	March	Unit 8: Single Candlestick patterns , Multiple candlestick patterns , The Support and Resistance
19	April	Unit 9: Volumes, Moving Averages , Indicators
20	April	Unit 9: The Fibonacci Retracements
21	April	Unit 9: The Dow Theory, Getting Started
22	April	Unit 10: Markets- Introduction and Basics, Classifying Your Market Activity
23	April	Unit 10: Taxation for Investors, Taxation for Traders
24	April	Unit 10: Turnover, Balance Sheet and P&L, ITR Forms
25	April	Unit 11: Equity Curve, Expected Returns
26	April	Unit 11: Portfolio Optimization, Value at Risk, Position Sizing for Active Trader
27	May	Revision
28	May	Revision
29	May	Revision
30	May	Revision for Theory Exam



Computer System Architecture (CMP510) [Theory]

Counselling Session	Month	Topic
1	January	Unit 1: CPU (Concept like address lines, data lines, internal registers), Modes of operation of CPU (Real mode, IA-32 mode, IA-32 Virtual Real Mode)
2	January	Unit 1: Process Technologies, Dual Independent Bus Architecture, Hyper Threading Technologies & its requirement, Processor socket & slots
3	February	Unit 1: Chipset basic, chipset Architecture, North / South bridge & Hub Architecture, Latest chipset for PC, Overview & features of PCI, PCI –X, PCI express, AGP bus
4	February	Unit 1: Logical memory organization conventional memory, extended memory, expanded memo Overview & features of SDRAM, DDR, DDR2, DDR3; Concept of Cache memory (L1 Cache, L2 Cache, L3 Cache, Cache Hit & Cache Miss), BIOS – Basics & CMOS Set Up, Motherboard Selection Criteria
5	February	Unit 2: Recording Techniques: FM, MFM , RLL, perpendicular recording, Hard Disk construction and working, Terms related to Hard Disk, Track, sector, cylinder, cluster, landing zone, MBR, zone recording, write pre-compensation.
6	February	Unit 2: Formatting (Low level, High level & partitioning), FAT Basics (Introduction to file system, FAT 16, FAT 32, NTFS), Hard Disk Interface (Features of IDE, SCSI, PATA, SATA, Cables and Jumpers.)
7	February	Unit 2: CD ROM Drive: Construction, recording.(Block diagram), DVD: Construction, Recording. (Block Diagram), Blue-ray Disc specification
8	February	Unit 3: CRT (Block diagram, working of monochrome and colour Monitor), Characteristics of CRT Monitor (DOT Pitch, Resolution, Horizontal Scanning frequency, Verticalscanning frequency, Interlaced Scanning, Non-Interfaced scanning), Aspect ratio
9	February	Unit 3: LCD Monitor, Functional Block Diagram of LCD monitor, working principle, Passive matrix, Active matrix LCD display
10	February	Unit 3: Touch Screen Display – The construction and working principle , Plasma Display Technology - Construction & working principle, Basic Block Diagram of Video Accelerator card
11	March	Unit 4: Keyboard, Types of key switches (Membrane, Mechanical, Rubber dome, Capacitive, optoelectronic and interfacing), Mouse: Opto-mechanical, optical ( New design)
12	March	Unit 4: Scanner: Flat Bed, Sheet-fed, Handheld: Block diagram of flat Bed and specifications, OCR, TWAIN, Resolution, Interpolation
13	March	Unit 4: Modem: Internal and External: Block diagram and specifications, Printer: Printer Characteristics, Dot matrix, Inkjet, Laser: block diagram and specifications
14	March	Unit 5: Block diagram and working of SMPS, Signal description and pin-out diagram of AT and ATX connectors, Power supply characteristics: Rated wattage, Efficiency, Regulation, Ripple, Load regulation, Line regulation
15	March	Unit 5: Power problems (Blackout, Brownout, surges and spikes), Symptoms of power problems

16	March	Unit 5: Protection devices: circuit breaker, surge suppressor. Uninterrupted Power Supply, Online and Offline UPS, working of UPS: Block diagram, advantages and disadvantages, Ratings
17	March	Unit 6: SCSI, SCSI cables and connectors, SCSI drive configuration, USB features
18	March	Unit 6: RS 232 (Voltages and 9 pin description), Centronics (interface diagram, important signals and timing waveform)
19	April	Unit 6: Firewire features, Blue tooth
20	April	Unit 7: POST (POST sequence, Beep codes, visual display codes), Preventive maintenance (Active, Passive, periodic maintenance procedure)
21	April	Unit 7: Diagnostic Tools (logic Analyzer, logic probe), Diagnostic software for trouble shooting PC
22	April	Unit 7: BGA workstation and its applications for reballing of north bridge and south bridge
23	April	Unit 8: Study and comparison of uniprocessors and parallel processors, Conventional and EPIC architecture, Evolution of parallel processors, Future trends and there architecture
24	April	Unit 8: Overview of Parallel Processing and Pipelining Processing, Necessity of High Performance, Constraints of conventional architecture, Parallelism in uni-processor system, Architectural Classification
25	April	Unit 8: Applications of parallel Processing, Instruction level Parallelism and Thread Level Parallelism, Explicitly Parallel Instruction Computing (EPIC) Architecture
26	April	Unit 8: Case Study of Intel Itanium Processor, Principles of scalable performance (Performance Metrics and Measures, Speedup Performance Laws), Programming aspects for Intel Itanium Processor.
27	May	Revision
28	May	Revision
29	May	Revision
30	May	Revision for Theory Exam

### Software Engineering (CMP511) [Theory]

Counselling Session	Month	Topic
1	January	Unit 1: Evolution of SE, Software Standards
2	January	Unit 1: Importance of SE, Various Models – Waterfall, Spiral, RAD
3	February	Unit 2: SRS, Fact Finding
4	February	Unit 2: DFD
5	February	Unit 2: ERD
6	February	Unit 2: Data Dictionary, Structure Charts
7	February	Unit 3: Architectural Design
8	February	Unit 3: Modular Design with SC Guidelines – Coupling / Cohesion
9	February	Unit 3: Interface Design – Screen Design
10	February	Unit 4: Logic, Algorithm Design
11	March	Unit 4: Design walk through
12	March	Unit 4: Critical Design Review

13	March	Unit 4: Coding
14	March	Unit 4: Programming Practices, Structured Programming
15	March	Unit 5: Testing Strategies
16	March	Unit 5: Testing Architecture, Testing Tools
17	March	Unit 5: Maintenance, Defect analysis
18	March	Unit 6: Attributes for Quality, Quality Standards
19	April	Unit 6: Checklist, SEI/CMMi
20	April	Unit 7: Software Change Management
21	April	Unit 7: Software Configuration Management
22	April	Unit 7: Change Control
23	April	Unit 8: Web SE, Case Tools
24	April	Unit 8: Project Matrix, UML
25	April	Unit 8: XP programming, OOAD
26	April	Unit 8: Agile programming
27	May	Revision
28	May	Revision
29	May	Revision
30	May	Revision for Theory Exam

#### JAVA (CMP512) [Theory]

Counselling Session	Month	Topic
1	January	Unit 1: History of Java, Features of Java, Difference in the working of C++ and Java, What is JDK, JRE and JVM?
2	January	Unit 1: Introduction to Class and objects, Instantiation in Java
3	February	Unit 1: Variables in Java, Scopes of the variables, Data types, Operators, Primitive Variables
4	February	Unit 1: Garbage Collection of the variables, Source File Declaration Rules, Class and Method Naming Rules, Camel Casing Rule
5	February	Unit 2: if statement, if-else statement, if – else if – else ladder, nesting of if
6	February	Unit 2: ? : operator, switch case, for loop
7	February	Unit 2: while loop, Do while loop, Jumps in Loops
8	February	Unit 3: Methods and Constructor, Method Overloading and Constructor Overloading
9	February	Unit 3: Method Overriding, Static members
10	February	Unit 3: Final keyword, Inheritance, Super keyword
11	March	Unit 4: Data Types in Java, Wrapper Classes, Conversion and Utility methods of Wrapper Class, Type Casting, Boxing and Autoboxing
12	March	Unit 4: Concept of Arrays, Array Declaration, Construction and Initialization, 1-D Array, Array of Objects, 2-D Arrays
13	March	Unit 5: String Handling, Understanding String class, Methods of String, StringBuffer and StringBuilder
14	March	Unit 5: Exception Handling, Difference in Exception and Error, Using try....catch
15	March	Unit 5: Using throws for handling Exception, Making our own Exception, Difference in throw and throws
16	March	Unit 6: Package, How Java Library uses Packages, Import statements in Java, Creating our own package, Making Jar Files



17	March	Unit 6: Abstract Class, Working with abstract class and abstract methods
18	March	Unit 6: Interfaces, Abstract Class vs Interfaces, Multiple Interface Implementation, Generalization using Interface
19	April	Unit 7: Working with File Class
20	April	Unit 7: Reading and Writing with Disk Files, BufferedReader and BufferedWriter
21	April	Unit 7: Object Serialization, Scanner class
22	April	Unit 8: Thread, Defining Threads, java.lang.Thread and java.lang.Runnable, Thread States
23	April	Unit 8: Thread Priorities, Synchronization
24	April	Unit 8: Generics and Collection, Defining Generics, Generics Methods, What is Collection API
25	April	Unit 8: Difference in Arrays and Collection, List(ArrayList, Vector and LinkedList)
26	April	Unit 8: Queue(PriorityQueue), Map(SortedMap)
27	May	Revision
28	May	Revision
29	May	Revision
30	May	Revision for Theory Exam

Lab: Computer System Architecture (CMP710) [Practical]

Practical Session	Month	Topic
1	January	Identify and draw the motherboard layout of Intel i3 processor and understand connection and layout of the H67 or P67 chipset
2	January	Perform Basic Input/output System (BIOS) setting and configuration setup using Complementary Metal Oxide Semiconductor (CMOS).
3	February	Format, partition and install a Hard Disk Drive (HDD) and format a pen drive.
4	February	Understand layout, characteristics and functions of different components of Hard Disk Drive (HDD) as a storage device.
5	February	Install Video Graphics Array (VGA) or Super Video Graphics Array (SVGA) display cards.
6	March	Install and understand the working of printer.
7	March	Install and understand the working of Input/output devices such as scanner and modem.
8	March	Connect Switched Mode Power Supply (SMPS) and identify different parts of SMPS. Understand the working of SMPS and Uninterrupted Power Supply (UPS).
9	March	Use diagnostic software to identify installed computer peripherals and test their working condition.
10	April	Find faults related to Monitor.
11	April	Find faults related to CPU.
12	April	Find faults related to Hard disk.
13	April	Find faults related to Printer and other peripherals.
14	May	Form a pico net using Bluetooth devices and transfer data.
15	May	Assemble PC and install an operating system.



Lab: Software Engineering (CMP711) [Practical]

Practical Session	Month	Topic
1	January	SRS
2	January	Justification for selection of suitable model
3	February	DFD
4	February	ERD (Use STARUML software) and Data Dictionary
5	February	Structured Chart
6	March	Design the input screens for sample project selected
7	March	Design the output screens for sample project selected
8	March	Design the reports for sample project selected
9	March	Cost estimation using COCOMO 1
10	April	Duration estimation using COCOMO 1 and draw Gantt Chart
11	April	Effort estimation using COCOMO 1
12	April	UML Diagrams 1 – Class Diagram, Use Case Diagram (Use STARUML software)
13	April	UML Diagrams 2 – Activity Diagram, Sequence Diagram, Collaboration Diagram (Use STARUML software)
14	May	What is meant by software testing? What are its types? Which are the tools used for testing?
15	May	What is meant by quality assurance?

Lab: JAVA (CMP712) [Practical]

Practical Session	Month	Topic
1	January	<ol style="list-style-type: none"> <li>1. Write a Java class to swap two numbers without using third variable.</li> <li>2. Write a Java Program to determine reverse the number</li> <li>3. Write a Java class to print the Fibonacci sequence till 100</li> <li>4. Write a Java Program to determine whether the number is Armstrong or not.</li> <li>5. Write a Java Program to determine whether the number is prime or not</li> </ol>
2	January	<ol style="list-style-type: none"> <li>1. Write a Java program for the following scenario: Run a loop from 1 to 100, while looping when the number is even print its square and when the number is odd print its cube.</li> <li>2. Write a Java program to print the following Floyd Triangle                     <pre> 1 0 1 1 0 1 0 1 0 1                     </pre> </li> <li>3. Write a Java Program to print following                     <pre> 1 2 3 4 5 1 2 3 4 1 2 3 1 2 1                     </pre> </li> </ol>
3	February	<ol style="list-style-type: none"> <li>1. Write a Java class Employee with variables name, age, gender write setter and getter methods for it.</li> <li>2. Write a class mobile with methods call() and sms(). Write a class</li> </ol>

		Demo and access it. 3. Write a class MathDemo with methods square() with one parameter and add() with two parameters. Call these methods to get the output.
4	February	1. Write a Java class for following methods <ul style="list-style-type: none"> <li>display() -- Display number from 1 to 100 using while loop in Java</li> <li>fibonacci() -- Prints Fibonacci series till 100</li> </ul>
5	February	1. Write a class Automobile with default constructor, write a class Plane which extends Automobile and has a default as well as parameterized constructor, write a class Airbus with a default constructor which extends Plane.
6	March	1. Write a Java Program to convert "25" to Primitive as well as Wrapper. 2. Write a Java program to convert 110011 to decimal value.
7	March	1. Write a Java Program to convert the "59" to Primitive float (without using Constructor of Float)
8	March	1. Write a class User with abstract methods pay() and receive(), later make two concrete class GoldUser and SilverUser, override the abstract method.
9	March	1. Write a Java program to write the following, class A with method m1( ) and m2( ) and write a class B with methods m3( ) and m4( ), Override the methods of A in class B.
10	April	1. Write an abstract class Car with methods start() and stop(). Write a class Santro and Audi and override the methods. 2. Write two interfaces SportsCar and CommercialCar and implement the appropriate interface on the appropriate class made in example 1.
11	April	1. Make an Interface CE which have methods call(), sms (), Make another interface ISO which have methods radiation() and sound(). Make two classes iPhone and Galaxy and make them implement both the interfaces. 2. Write a Java program to make a package com.shapes, make classes Circle and Square in the same package.
12	April	1. Write a Java Program to make an Exception AgeException. When user passes some age and if age is less than 18 throw this Exception. 2. Create an Exception StringNotPalindromeException. Write a class with method which throws this Exception when String passed is not palindrome.
13	April	1. Write a Java program to determine the number of vowels in a String 2. Write a Java program for separate hours, minutes and seconds from following string 01:23:45 PM.
14	May	1. Write a Java Program to store the following data, in the collection you feel will suite best. Name- Tom, Email- tom@gmail.com, Phone:9988776655 2. Write a Java Program to find the minimum value in Vector [8,9,1,3,4]. 3. Write a Java Program to find the number of String starting with „S“ from following : TreeSet[ Smith, Alex , Tom, Steve, Mark, Sammy]
15	May	1. Sort the given list of objects in order of their email Contact: id, name, email, phone

**B.C.A[P131]**

Name of Programme	Bachelor of Computer Application
Programme Code	P131
Level of Programme	Under Graduate
Year	Third Year
Semester	5 <sup>th</sup> Semester

**Quantitative Aptitude (CMP332) [Theory]**

Counselling Session	Month	Topic
1	July	Unit 1: HCF and LCM
2	July	Unit 1: Divisibility
3	July	Unit 1: Factors, Remainders
4	July	Unit 1: Cyclicity of Numbers
5	July	Unit 2: Weighted Average
6	August	Unit 2: Allegation
7	August	Unit 2: Mean, Median and Mode
8	August	Unit 3: Basics of Percentages
9	August	Unit 3: Successive Discounts/Percentages, Percentage Error
10	August	Unit 3: Basics of Profit and Loss, Profit and Loss Percentage
11	August	Unit 4: Ratio and Proportion
12	August	Unit 4: Mixture and Allegations
13	September	Unit 4: Partnership
14	September	Unit 5: Simple Interest and Compound Interest- Basic Concepts
15	October	Unit 5: Banking Structure for Interest Charge
16	October	Unit 5: EMI Calculation
17	October	Unit 6: Time and Work- Basic Concepts
18	October	Unit 6: Pipes and Cistern
19	October	Unit 6: Chain Rule
20	October	Unit 7: Time Speed and Distance- Basics
21	November	Unit 7: Relative Speed
22	November	Unit 7: Problem on Trains, Boats and Streams
23	November	Unit 7: Races
24	November	Unit 8 Permutations and Combinations, Probability- Basics
25	December	Unit 8 Conditional Permutations and Combinations
26	December	Unit 8 Conditional Probability
27	December	Revision
28	December	Revision
29	December	Revision
30	December	Revision for Theory Exam

**E Commerce Technologies (CMP513) [Theory]**

Counselling Session	Month	Topic
1	July	Unit 1: Enabling Technologies of the World Wide Web
2	July	Unit 1: History of E-Commerce
3	July	Unit 1: Introduction to Business Models for E-Commerce



4	July	Unit 2: Traditional Marketing, Identifying Web Presence Goals, Online Marketing
5	July	Unit 2: Internet Marketing Trends
6	August	Unit 2: Target Markets
7	August	Unit 2: Marketing Strategies
8	August	Unit 3: Security on the Net
9	August	Unit 3: E-Business Risk Management Issues
10	August	Unit 4: Digital Payment Requirements, Digital Token-based
11	August	Unit 4: Classification of New Payment Systems
12	August	Unit 4: Properties of Electronic Cash (E-Cash)
13	September	Unit 4: Risk and E-Payment Systems, Digital Signature
14	September	Unit 5: Customer Relationship Management
15	October	Unit 5: Typical Business Touch-Points
16	October	Unit 6: E-Supply Chain goals
17	October	Unit 6: E Supply advantages and benefits
18	October	Unit 6: E supply and value creation for customer
19	October	Unit 7: Information and Strategy
20	October	Unit 7: The Virtual Value Chain
21	November	Unit 7: Seven Dimensions of E-Commerce Strategy
22	November	Unit 7: Value Chain and E-Strategy
23	November	Unit 7: Strategies for Web Site Development
24	November	Unit 8: Origins of WAP
25	December	Unit 8: WAP Programming Model
26	December	Unit 8: Wireless Technologies
27	December	Revision
28	December	Revision
29	December	Revision
30	December	Revision for Theory Exam

Advance JAVA (CMP514) [Theory]

Counselling Session	Month	Topic
1	July	Unit 1: JDBC Architecture, Overview of Drivers
2	July	Unit 1: DBC Driver Manager, Steps for accessing database using JDBC API
3	July	Unit 1: Statements Prepared, Statement Callable, Statement Scrollable and Updatable ResultSet
4	July	Unit 1: ResultSetMetaData and DatabaseMetaData, Working with Rowset Interface
5	July	Unit 2: Introduction To Java Servlets, Servlet API, Servlet Life-Cycle
6	August	Unit 2: Working With Apache Tomcat
7	August	Unit 2: GenericServlet, HttpServlet
8	August	Unit 2: HttpSession, Session Binding/Tracking, Inter-Servlet Communication
9	August	Unit 3: JSP SYNTAX, Page Directive, Include Directive
10	August	Unit 3: Data Declaration and Method Definition, ScriptletsImplicit Objects, Custom Tags, Session Tracking in JSP
11	August	Unit 3: Page Context, Exception
12	August	Unit 4: Why Hibernate?, Understanding ORM
13	September	Unit 4: Objects and Persistence, Hibernate Architecture, Mapping Documents



14	September	Unit 4: Hibernate Database Connection, Creating Persistent Classes, Mapping Collection of Objects
15	October	Unit 4: Persistent Object Life Cycle, Hibernate with Servlets, HQL: Hibernate Query Language
16	October	Unit 5: Introduction to Spring Framework, Inversion of Control and Dependency Injection
17	October	Unit 5: IOC Container, Bean Creation
18	October	Unit 5: Construction Injection
19	October	Unit 5: Setter Injection
20	October	Unit 6: Spring Web MVC
21	November	Unit 6: MVC Architecture
22	November	Unit 6: Front Controller
23	November	Unit 6: DispatcherServlet
24	November	Unit 7: Introduction to Java API, Using Java Mail API to send mail using Java Codes
25	December	Unit 7: Sending Text Mail, Sending HTML Mail, Sending Mail with Attachments.
26	December	Unit 8: JSON Syntax, Data Types, Objects, Arrays in JSON, JSON Library in Java
27	December	Unit 8: Encoding a JSON Object in Java, Decoding a JSON Object in Java, Publishing a Service using JSON in JSP
28	December	Revision
29	December	Revision
30	December	Revision for Theory Exam

#### Linux Administration (CMP515) [Theory]

Counselling Session	Month	Topic
1	July	Unit 1: Open Source and Red Hat, Origins of Linux, GNU & Linux Distributions, Versions of Linux, Architecture of Linux
2	July	Unit 1: Duties of the System Administrator - I
3	July	Unit 1: Duties of the System Administrator - II
4	July	Unit 2: Installation of Redhat Linux on Virtual Machine
5	July	Unit 2: Understanding Partitions of Linux, Booting and shutting down Linux
6	August	Unit 2: Understanding Boot loaders, Bootstrapping, Init process, rc scripts
7	August	Unit 2: Enabling and disabling services, Different Run levels in Linux, Understanding Linux file system structure
8	August	Unit 3: Using Command Line - I
9	August	Unit 3: Using Command Line - II
10	August	Unit 3: Managing Software - I
11	August	Unit 3: Managing Software - II
12	August	Unit 3: Managing Software - III
13	September	Unit 4: Working with Users, Groups and Permissions - I
14	September	Unit 4: Working with Users, Groups and Permissions - II
15	October	Unit 5: TCP/IP Networking - I
16	October	Unit 5: TCP/IP Networking - II
17	October	Unit 5: Network File System - I
18	October	Unit 5: Network File System - II
19	October	Unit 6: Configuring DNS and DHCP - I

20	October	Unit 6: Configuring DNS and DHCP - II
21	November	Unit 6: Configuring DNS and DHCP - III
22	November	Unit 7: Connecting to Microsoft Networks - I
23	November	Unit 7: Connecting to Microsoft Networks - II
24	November	Unit 7: Setting up a Mail Server:
25	December	Unit 8: Securing Server with iptables - I
26	December	Unit 8: Securing Server with iptables - II
27	December	Unit 8: Configuring Web Server
28	December	Revision
29	December	Revision
30	December	Revision for Theory Exam

Lab: E Commerce Technologies (CMP713) [Practical]

Practical Session	Month	Topic
1	July	Home page design: Design a Home page for a Business to Consumer website
2	July	Form validation (Ajax enabled): Design a page to enter customer details such as name address phone number apply proper validation.
3	August	Customer payment System: Explain with diagram working of e Payment System (Debit, Credit Card, Smart Card)
4	August	Internet and Networking: Explain types of Network and Role of Internet in eCommerce.
5	August	Search Engines: Study any popular search engine and note down the features.
6	September	Access control mechanism of a e-Commerce website: Study session management feature of e Commerce website.
7	September	ISP: State the role of ISP.
8	October	Digital signature: State the Importance of Digital signature in online business.
9	October	Catalogue Design: Design a Catalogue using any web technologies.
10	October	Cookies: Explain cookies, write steps to create a cookie.
11	November	Case Study 1: M commerce
12	November	Case Study 2: Bitcoin
13	November	Case Study 3: Use of SMO and SEO
14	December	Case Study 4: B2B and B2C
15	December	Case Study 5: C2C and C2B

Lab: Advance JAVA (CMP714) [Practical]

Practical Session	Month	Topic
1	July	Servlet -I
2	July	Servlet -II
3	August	Servlet -III
4	August	JSP - I
5	August	JSP - II
6	September	JDBC
7	September	Java Email

8	October	Hibernate- I
9	October	Hibernate- II
10	October	Spring- I
11	November	Spring- II
12	November	JAVA with JSON-I
13	November	JAVA with JSON-II
14	December	JAVA with JSON-III
15	December	JAVA with JSON-IV

Lab: Linux Administration (CMP715) [Practical]

Practical Session	Month	Topic
1	July	Installation of Redhat Linux Installation.
2	July	Working with Grub and init file
3	August	Basic Linux Commands
4	August	Advanced Linux Commands.
5	August	Working with Vi Editor.
6	September	Working with Users, Groups, and Permissions.
7	September	Setting NFS File Server.
8	October	Setting up DNS server.
9	October	Setting Samba Server.
10	October	Setting IP address and connecting to internet.
11	November	Understanding Firewall configuration through graphical and command mode.
12	November	Configuring ftp on linux.
13	November	Configure Apache Web server to support html & PHP file.
14	December	Install gcc compiler and execute sample C program.
15	December	Install g++ compiler and execute sample C++ program.



  
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