SEMESTER I

Core Paper I

C PROGRAMMING

Instructional Hrs. : 75 **Sub. Code :15CSUC101/ 15CAUC101**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective : To make the students understand the basic concepts of C programming language and to understand the logic of the program

UNIT I

Introduction to Computer Problem Solving: Introduction – The Problem Solving Aspect – Top-Down Design. **Fundamental Algorithms:** Introduction – Exchanging the Values of Two Variables – Summation of a Set of Numbers – Factorial Computation – Generation of the Fibonacci Sequence – Reversing the Digits of an Integer.

UNIT II **15 Hrs.**

Overview of C – Constants, Variables, and Data Types – Operators and Expressions – Managing Input & Output Operations: Introduction – Reading a Character – Writing a Character – *Formatted Input – Formatted Output.*

UNIT III **15 Hrs.**

Decision Making and Branching: Introduction – Decision Making with if Statement – Simple if Statement – The if……else Statement – Nesting of if…..else Statements – The Else if Ladder – The Switch Statement – The?: Operator – *The Goto Statement.* **Decision Making and Looping:** Introduction – The While Statement – The do Statement – The for Statement – Jumps in Loops.

UNIT IV **15 Hrs.**

Arrays – Character Arrays and Strings – User-defined Functions.

UNIT V **15 Hrs.**

Structures and *Unions* – Pointers.

Note: *Italics* denotes Topics for Self Study

TEXT BOOK:

1. R.G.Dromey, How to Solve it by Computer, Pearson Education, Twelfth Impression
2. **Balagurusamy E.** Programming in Ansi C , Tata McGraw-Hill Publishing Company Limited – New Delhi. Sixth Edition

REFERENCE BOOK:

1. **Ashok N. Kamthane,** Programming and Data Structures, Pearson Education, Pvt Ltd, New Delhi.

SEMESTER I

Practical I

C PROGRAMMING LAB

Instructional Hrs. : 75 **Sub. Code : 15CSUCP01/ 15CAUCP01**

Max. Marks : CIA -40; ESE -60 **Credits: 3**

Objective : To make the students to implement the concepts of C programming.

1) Write a program to find the sum, average, standard deviation for a given set of numbers.
2) Write a program to generate n Fibonacci nos.
3) Write a program to determine the prime numbers up to a given number.
4) Write a program to convert a decimal number into binary.
5) Write a program to multiply two matrices using functions.
6) Calculate the binomial co-efficient nCr using functions.
7) Write a program to check whether a given word is a palindrome or not.
8) Implement BINARY SEARCH to find a particular name in a list of names.
9) Write a program that declares and initializes a double, an int and a char. Next declare and initialize a pointer to each of the three variables. Your program should then print the address, value stored in and the memory size of each of the six variables.
10) Arrange a set of number in ASCENDING ORDER using Pointers.
11) Write a program to print the Student's Mark sheet assuming Register number, name, and marks in 5 subjects in a Structure. Create an array of Structures and print the mark sheet in the university pattern.
12) Write a program to count the number of alphabets, special characters and words from a line of text.

SEMESTER III

Core Paper VI

OPERATING SYSTEM

Instructional Hrs. : 75 **Sub. Code : 15CSUC409/ 15CAUC306**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective : To make the students understand the concepts of System Software.

UNIT I 14 Hrs.

Introduction: What is an Operating System?. **Process Concepts:** Definition of Process – Process States – Process States Transitions – The Process Control Block – *Operations of Processes* – Suspend and Resume - Interrupt Processing- **Asynchronous Concurrent Processes** : Mutual Exclusion – Critical Sections – Semaphores. **Deadlock and Indefinite Postponement.**

UNIT II 14 Hrs.

STORAGE MANAGEMENT

Real Storage: Real Storage Management Strategies – Contiguous Versus Non-Contiguous Storage Allocation – Single User Contiguous Storage Allocation – Fixed Partition Multiprogramming – Variable Partition Multiprogramming

Virtual Storage: Virtual Storage Management Strategies – Page Replacement Strategies – Demand Paging – *Page Size***.**

UNIT III 15Hrs.

PROCESSOR MANAGEMENT

Job and Processor Scheduling: Introduction – Scheduling Levels, Objectives, Criteria - Preemptive Vs Non-Preemptive Scheduling – *Priorities* – Deadline Scheduling – FIFO – RR – SJF – SRT – HRN

UNIT IV 16 Hrs.

AUXILIARY STORAGE MANAGEMENT

Disk Performance Optimization: Introduction - Operation of Moving-Head Disk Storage – Need for Disk Scheduling – Characteristics of Disk Scheduling Policies - Seek Optimization – *RAM Disks - Optical Disks.*

UNIT V 16 Hrs.

File and Database Systems: Introduction – The File System – File System Functions – File Organization – Allocating and Freeing Space – File Descriptor – Access Control Matrix.- Access Control by User Classes.

Case Study: LINUX : *Introduction – Unix and Linux Comparison – Process Management – File Management – Device Drivers – Security.*

Note : Italics denotes Self Study Topics

TEXT BOOKS:

1. Deitel H.M, Operating Systems, 2nd Edition, Pearson Education Publication, 2003.

REFERENCE BOOKS:

1. Achyut S Godbole, Operating System, TMH Publications, 2002.

SEMESTER - III

Practical – III

JAVA PROGRAMMING LAB

List of Practical

Instructional Hrs. : 75 **Sub. Code : 15CSUCP03 / 15CAUCP03 / 15CTUCP03**

Max. Marks : CIA -40; ESE -60 **Credits: 3**

Objective : To make the students to implement the concepts of Object Oriented Programming using Java.

1. Write a Java program to Print Pascal's triangle.
2. Write a program to display multiplication table using default and argument constructors.
3. Write a program to find the area of the square, rectangle and triangle using the method of overloading.
4. Create a class Employee which includes employee number, Name, Year of experience. To accept N number of employee details, and sort it by employee name wise.
5. Write a program to extract a portion of a character string and print the extracted string.
6. Define an interface having one method that takes an integer parameter. For this method, provide two implementations: In the first one, just print the value and in the second one, print the square of the number. Try to call both the versions.
7. Create a package to calculate arithmetic operations of two numbers and another package to calculate logical operations of two numbers. Write a Java program to use these packages.
8. Write a program using threads to increment a shared variable.
9. Create a program to handle three types of exceptions.
10. Design an applet program to draw several shapes.
11. Create an Applet Program to draw human eyes at mouse click position
12. Write a java program to manage purchase details using Random Access file.

SEMESTER III

Allied Paper III Business Accounting

(40% Theory, 60% Problems Only)

Instructional Hrs. 75 **Sub Code: 15CSUA404/ 15CAUA303**

Max. Marks: CIA -25; ESE -75 **Credits: 5**

Objective: To make the students understand the basic concepts of Business Accounting

UNIT I **15 Hrs.**

Accounting: Definition – Objectives – Branches of Accounting – Accounting Concepts – Conventions – *Systems of Accounting* – Rules for Double-Entry System of Book Keeping – Preparation of Journal and Ledger Accounting.

UNIT II **15 Hrs.**

Subsidiary Books: Purchase Book – *Sales Book* – Purchase Return Book – Sales Return Book – Cash Book (Two Columnar only) - Petty Cash Book.

UNIT III **15 Hrs.**

Preparation of Trial Balance – Final Accounts: *Trading, Profit and Loss Account* and Balance Sheet with Simple Adjustments.

UNIT IV **15 Hrs.**

Depreciation: Definition - Causes of depreciation – Basic factors - Methods of Depreciation – Straight Line Method and Diminishing Balance Method (Simple Problems). Pricing of Material Issued: FIFO – LIFO – Simple and Weighted Average Method.

UNIT V **15 Hrs.**

Cost Accounting: *Elements of Costing* – Types of Costing – Preparation of Simple Cost Sheets. Individual Bonus Plans – Halsay System and Rowan System.

Note : *Italics* denotes Topics for Self Study

TEXT BOOKS:

1. .**Murthy T.S.,. Margham A.,** *Advanced Accountancy,* Reddy Pub., 1st Edition
2. **Jain S.P &.Narang, K.L,** *Cost Accounting Principles and Practice,* Kalyani Publisher.

REFERENCE BOOKS:

1. **Grewal**, **T.S.,** *Double Entry Book Keeping,* Sultan Chand & Sons Publisher
2. .**Vinayakam M.N., Mani P.L., Nagarajan K.L** *Principles of Accountancy,* 3rd Edition.

SEMESTER IV

Core Paper VII

DATA BASE MANAGEMENT SYSTEMS

Instructional Hrs. : 75 **Sub. Code: 15CSUC407/ 15CAUC407**

Max. Marks : CIA -25; ESE -75 **Credits: 3**

Objective : To make the students understand the need for database system, it's features and advantages.

UNIT I **15 Hrs.**

Introduction : Database - System Applications - Purpose of database Systems - View of Data - Data Models - Database Languages - Relational Databases - Database Design - Data Storage and Querying - *Transaction Management* - Database Architecture - Database users and Administrators.

Relational Databases: Structure of Relational Databases - Database Schema - Keys- Relational Algebra.

UNIT II **15 Hrs.**

Introduction to SQL: Overview of the SQL Query Language - *Basic structure of SQL Queries* - set operations - Null Values - Aggregate functions - Nested subqueries - Modification of the Database. **Intermediate SQL:** Join Expressions – Views.

UNIT III **13 Hrs.**

Intermediate SQL: Integrity Constraints. **Advanced SQL:** Embedded SQL- Triggers. **Database Design and the E-R Model:** Entity-Relationship Model - Constraints - Entity-Relationship Diagram - *Extended E-R Features.*

UNIT IV **16 Hrs.**

Relational Database Design: *Features of Good Relational Designs* - Atomic Domains and First Normal Form - Decomposition using Functional Dependencies - Functional Dependency Theory - Decomposition using Multivalued Dependency - More Normal Forms.

UNIT V **16 Hrs.**

Object Based Databases: Overview - Complex Data types - *Structured Types and Inheritance in SQL* - Object-Identity and Reference Types in SQL.

Data Warehousing and Mining: Decision–support systems - Data warehousing - Data Mining. **Spatial and Temporal Data and Mobility:** Spatial and Geographic Data - Multimedia Databases - Mobility and Personal Databases.

Note : *Italics* denotes Self Study Topics

TEXT BOOK:

Abraham Silberschatz, Hentry F.Korth, Sudharshan S., *Database System Concepts* Mc-Graw Hill International Editions (2011), Sixth Edition.

REFERENCE BOOKS:

1. Alexis Leon And Mathews Leon, *Database Management Systems*, Vikas Publishers.
2. *Fundamentals of Database Systems*- Elmasri Navathe, Pearson Education Pub, 3rd Edition, 2001.

SEMESTER IV

Core Paper IX

CLIENT / SERVER COMPUTING

Instructional Hrs. : 75 **Sub. Code : 15CAUC409/ 15ITUC409/ 15CTUC613**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective : To make the students to gain ample knowledge in Client/Server Computing.

UNIT I **15 Hrs.**

Client / Server computing - What is client / server? – File servers, database servers, Transaction servers, Groupware servers, Object servers, Web server – FAT server or client / server -Client / Server building blocks

UNIT II **15 Hrs.**

Client / Server and operating systems – the Anatomy of a server program – Needs of Client / Server from an OS – server scalability – Client anatomy – Client and server OS trends – Client OS and server OS. NOS: Creating the single system image - Remote procedure Calls (RPC) – Messaging and Queuing: The MOM Middleware

UNIT III **15 Hrs.**

SQL Database servers: What does SQL do? – The ISO standards – What does a database server do? – Stored procedures, Triggers and Rules. **Data warehouses –** OLTP (Online Transaction Processing) – Decision Support System (DSS) – Executive Information System (EIS) – comparing Decision Support and OLTP system – Production vs. Information Database – The data ware house

UNIT IV **15 Hrs.**

Client / Server Transaction Processing – The ACID properties – Transaction Models – TP monitors – Client / Server groupware – Importance of Groupware –

What is Groupware – The components of Groupware. Distributed Object, CORBA style – CORBA: ORB - The Anatomy of a CORBA ORB.

UNIT V **15 Hrs.**

Web client / server – The Evolution of the Web- Client/Server , Web Style -What is URL? –Shortest HTML tutorial – HTTP – 3tier client / server – HTML web based forms – CGI: The server side of the web.

Note : Italics denotes Topics for Self Study

TEXT BOOK

1. Robert Orfali, Dan Harkey and Jeri Edwards, Client /Server Survival Guide, Wiley India Publication Private Limited, Third Edition, 2008.

REFERENCE BOOKS

1..Nein Jenkins, Client / Server Unleashed, 1st Indian Edition, 1998,Tech Media .

2.Partick N.Smith, Steven L.Guengerich, Client /Server Computing , 2nd Edition, 2002,PHI.

SEMESTER V

Core Paper X

COMPUTER NETWORKS

Instructional Hrs. : 90 **Sub. Code : 15CSUC510 / 15CAUC510**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective : To make the students understand the basic concepts of Computer Networks.

UNIT I **15 Hrs.**

Introduction: *Uses of Computer Networks* – Network hardware – Network Software – Reference Models – The OSI Reference Model – The TCP/IP Reference Model.

UNIT II **20 Hrs.**

The Physical Layer: Guided Transmission Media – **The Public Switched Telephone Network:** Switching .

Data Link Layer: Data Link Layer Design Issues – Error Detection and Correction.

UNIT III **20 Hrs.**

Data Link Layer: Elementary Data Link Protocols.

The Medium Access Control: Multiple Access Protocol – The Channel Allocation Problem - Multiple Access Protocols: Carrier Sense Multiple Access Protocols – Collision-Free Protocols – Limited Contention Protocols – **Bluetooth:** Bluetooth Architecture – Bluetooth Applications – **Data link Layer Switching:** Repeaters, Hubs, Bridges, Switches, Routers and Gateways.

UNIT IV **20 Hrs.**

The Network Layer: Network layer Design issues – Routing Algorithms: The optimality Principle – Shortest path routing – Flooding – Distance Vector Routing – Link State Routing – Hierarchical Routing – Broadcast Routing – Multicast Routing – Routing for Mobile Hosts.

The Transport Layer: The Transport Service: Services provided to the Upper Layers – Transport Service Primitives – Berkeley Sockets.

UNIT V **15 Hrs.**

The Transport Layer: Elements of Transport Protocols.

The Application Layer: DNS-*The Domain name System.*

Network Security: Cryptography – Introduction to Cryptography – Substitution Ciphers – Transposition Ciphers – **Symmetric-Key Algorithms:** DES – Public-Key Algorithms – **Digital Signatures:** Symmetric-Key Signatures – Public-Key Signatures.

Note : ***Italics*** **denotes Self Study Topics**

TEXT BOOKS

1. **Andrew S. Tanenbaum, David J. Wetherall,** *Computer Networks***,** Pearson Education, Asia, Fifth Edition 2012.

REFERENCE BOOKS

1. **Miller**, *Data and Network Communications*, Vikas Publications, 2001.
2. **William A. Shay,** *Understanding Data Communication and Networks*, Second Edition, Vikas Publications, 2001.

SEMESTER V

Core Paper XII

OPEN SOURCE COMPUTING

Instructional Hrs. : 75 **Sub. Code: 15CSUC512/ 15CAUC512/**

Max. Marks: CIA -25; ESE -75 **Credits: 4**

Objectives:

1. To expose students in open source computing environment and introduce them to use open source packages
2. Explore implementations of some of the underlying technologies of open source applications.

UNIT - I **15 hrs**

Introduction to Android: A Little Background – What Android Isn't – An Open Platform for Mobile Development – Native Android Applications – Android SDK Features – Introducing the Open Handset Alliance – What does Android run on? – Why develop for Mobile? – Why develop for Android? – **Introducing the Development Framework**: What comes in the box? – Understanding the Android Software Stack – The Dalvik Virtual Machine – Android Application Architecture.

UNIT - II **15 hrs**

Developing for Android: What you need to begin –Downloading and Installing the Android SDK – Developing with Eclipse – Using the Android Developer tools Plug-In for Eclipse – Using the Support Package –**Creating your first Android Application**: Creating a New Android Project – Creating an Android Virtual Device – Creating Launch Configurations – Running and Debugging your Android Application – Types of Android Applications – Android Development Tools.

UNIT - III **15 hrs**

Creating Applications and Activities: What makes an Android Application? – Introducing the Application Manifest File – Using the Manifest Editor the Android Application Lifecycle – Understanding and application's priority and its process states – Introducing the Android Application Class – A closer look at Android Activities.

UNIT - IV **15 hrs**

Audio, Video and Using the Camera: Playing Audio and Video – Manipulating Raw Audio – Creating a Sound Pool – Using Audio Effects – Using the Camera for taking Pictures – Recording Video – Using Media Effects – Adding Media to the Media Store.

UNIT - V **15 hrs**

Bluetooth, NFC, Networks and Wi-Fi: Using Bluetooth – Managing Network and Internet Connectivity – Managing Wi-Fi – Transferring Data using Wi-Fi Direct – Near Field Communication. **Telephony and SMS:** Using Telephony – Introducing SMS and MMS.

TEXT BOOK:

Reto Meier. 2012. **Professional Android 4 Application Development**. Wiley India Pvt Ltd.

REFERENCE BOOK:

Paul Deitel, Harvey Deitel, Abbey Deitel and Michael Morgano. **Android for Programmers An App-Driven Approach.**

SEMESTER V

Practical Lab V: Open Source Computing Lab

Instructional Hrs. : 75 **Sub. Code : 15CSUCP05 / 15CAUCP05**

Max. Marks : CIA - 40; ESE -60 **Credits: 3**

Objective : To make the students understand the basic concepts of .NET Programming.

1. Creating an app to display Hello World.
2. Creating an Android Simple Login Application.
3. Creating Simple Converter Application in Android.
4. Creating Calculator App in Android.
5. Creating simple Home Screen Widget in Android.
6. Creating Android Chat App in Android.
7. Creating Simple Android Camera Application.
8. Creating Basic List View Demo in Android.
9. Creating a simple Web Browser in Android.
10. Creating Google Map in Android.

SEMESTER V

Core Paper X: PC Hardware and Troubleshooting

Instructional Hrs: 90 **Sub. Code: 15ITUC408 / 15CTUC510**

Max. Marks: CIA – 25; ESE – 75 **Credits: 4**

Objective: To learn the hardware concepts and troubleshooting of a computer.

UNIT I **15 Hrs.**

PC-Hardware Overview: Introduction-Hardware-BIOS-DOS Interaction-The PC family-PC Hardware-Interconnections Between Boxes-Inside the System Box-Motherboard Logic-DMA Channel-Floppy Disk Controller (FDC)- Memory Refresh-Post Sequence-Overview of advanced PCs.

UNIT II **15 Hrs.**

Support Chips in the Motherboard : Introduction-Dumb and Smart Chips- Clock generator-Bus Controller-Interrupt Controller-Programmable Interval Timer-8255A-5 Programmable Peripheral Interface(PPI)-DMA Controller-Support chips for advanced microprocessors.

Print Controller: Controller Hardware overview. **Hard disk Controller Subsystem:** Overview of HDC Organization.

UNIT III **15 Hrs.**

PC Bus and Motherboard: PC Bus and Motherboard Functions-Reset Logic (8088-PC)-DMA Logic (8088-PC)-wait State Logic (8088-PC)-Time of Day (TOD) Logic (8088-PC)-Speaker Logic (8088-PC)-Keyboard Interface (8088-PC)-SMPS

Display Adapter: Introduction-CRT Display-CRT Controller Principle-CRT Controller- Color/Graphics Adapter-Second Generation Graphics Adapters-New Trends in Display Controllers-Display Adapters Interface.

UNIT IV **15 Hrs.**

Installation and Preventive Maintenance-System Configuration-Pre-Installation Planning-Installation Practice-Routine Checks-PC Assembling and Integration - Engineering Version and Compatibility-Preventive Maintenance-Virus-Data recovery.

UNIT V **15 Hrs.**

Keyboard Maintenance and Troubleshooting–Correcting problem keyboards-vacuum cleaners and keyboards-replacing the spacebar-preventing problems-Dealing with large objects-Dealing with spills-disabling a keyboard-**Troubleshooting a Pointing Device** -mouse/trackball interfaces-serial mice-bus mice-PS/2 mice-USB mice-mouse driver software issues-mouse keys under windows 9x-adjusting mouse properties-common detection issues- **Modem Troubleshooting**-check the command processor-check the dialer and telephone line-typical communication problems-Modem troubleshooting in windows 98-resolving resource conflicts-other issues-checking modem firmware-**Troubleshooting a Soundboard**-dos drivers and driver order- full duplex drivers-soundboard acceleration-multiple codecs-WAV playback problems-**Troubleshooting Video Adapters**-Basic problem isolation-multiple display support guide-missing display options.

Note: Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Govindarajalu B**, IBM PC and Clones Hardware, Troubleshooting and Maintenance, Tata McGraw-Hill Publishing Company Limited, New Delhi-Second Edition, 2008. [Unit I-IV]
2. **Bigelow's**, Troubleshooting,Maintaining &Rerparing PCs , Tata McGraw-Hill Edition 2001,Fifth Edition. [Unit V]

REFERENCE BOOKS

1. **Craig Zacker and John Rourke**, The Complete Referenec-PC Hardware, Tata McGraw-Hill Publishing Company Limited, New Delhi Edition-2001.
2. **Ron Glister**, PC Hardware a Beginner's Guide, Tata McGraw-Hill Publishing Company Limited, New Delhi Edition-2001.
3. **Sanjay K Bose**, Hardware and Software of Personal Computers, New Age International (P) Limited, Publishers, New Delhi, 2000.

SEMESTER V

Core XI: Software Engineering

Instructional Hrs: 75 **Sub. Code: 15CTUC511**

Max. Marks: CIA – 25; ESE – 75 **Credits: 4**

Objective: To learn engineering practices in Software development methodologies and Evaluation methods.

UNIT I **15 Hrs.**

Introduction – The evolving role of software - software crisis – software myths – software engineering layered technology- *software process*- software process models – prototyping model- The RAD Model-Evolutionary software process models- Component based Development- The Formal methods- Fourth generation Techniques.

UNIT II **15 Hrs.**

Analysis concepts & Principles: Requirements analysis and elicitation for software – Analysis principles - *software prototyping* – specification. **Analysis Modeling :** data modeling – functional modeling and information flow – behavioral modeling.

UNIT III **15 Hrs.**

Design Concepts & Principles: The design process – design principles – design concepts – effective modular design. User Interface Design – The golden rules – UID – *Task analyzing and modeling* – Interface Design Activities – Implementation Tools – Design Evaluation.

UNIT IV **15 Hrs.**

Component level design: Structured Programming – Comparison of Design notations Software testing techniques – Software testing fundamentals – Test case design - *White box testing* – Basis path testing – control structure testing – Black Box testing.

UNIT V **15 Hrs.**

Software testing strategies – A strategic approach to software testing - Unit Testing – Integration testing – *validation testing* – system testing - **Object oriented Design:** Design for Object Oriented Systems – System Design process – The object Design Process- **Reengineering** – Software Reengineering- Reverse Engineering.

Note: Self study topics are denoted in Italics

TEXT BOOK

Roger S.Pressman, S*oftware Engineering,* TMH Publishers, 5th Edition, 2005.

REFERENCE BOOKS

1. Ian Somerville , Software Engineering, Pearson Education Publ, 6th Edition, 2001.

2. **Watts S. Humphery**, *A discipline for Software Engineering*, Pearson Education Publishers, 2001.

SEMESTER II

Core Paper III: Object Oriented Programming With C++

Instructional Hrs. : 60 **Sub. Code : 15ITUC203**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective : To make the students understand the basic concepts of Object Oriented Programming With C++.

UNIT I **12 Hrs.**

Introduction to C++: Key Concepts of OOP – Advantages – Object Oriented Languages – **Input and Output in C++:** Streams in C++ – Pre-Defined Streams – Unformatted Console I/O Operations –Formatted Console I/O Operations – C++ Declarations – **Control Structures**: Decision Making Statements – If…Else – Jump – GOTO – Break – Continue – *Switch Case Statements* – Loops in C++ – For – While – Do…While Loops – Functions in C++ - In Line Functions – Function Overloading.

UNIT II **12 Hrs.**

Class and Objects: Declaring Objects – Defining Member Functions – Static Member Variables and Functions – Array of Objects – Friend Functions – Overloading Member Functions – Bit Fields and Class. **Constructor and Destructors :** Characteristics – Calling Constructor and Destructors – *Constructor and Destructor with Static Member.*

UNIT III **12 Hrs.**

Operator Overloading: Overloading Unary - Binary Operators – Overloading Friend Functions – Type Conversion – **Inheritance:** Types of Inheritance – Single - Multilevel - Multiple - Hierarchical - *Hybrid and Multi Path Inheritance* – Virtual Base Classes – Abstract Classes.

UNIT IV **12 Hrs.**

Pointers: Declaration – Pointer to Class - Object – THIS Pointer – Pointer to Derived Classes and Base Classes – **Arrays:** Characteristics – Arrays of Classes – Memory Models – New and Delete Operators – Dynamic Objects – Binding - *Polymorphisms* and Virtual Functions.

UNIT V **12 Hrs.**

Files: File Stream Classes – File Modes – Sequential Read/ Write Operations – Binary and ASCII Files – Random Access Operation- Command Line Arguments – **Exception Handling:** Principles of Exception Handling- The Keywords try, throw and catch-Exception Handling Mechanism-Multiple Catch Statements-Catching Multiple Exceptions-Rethrowing Exception – **Strings:** Declaring and Initializing String Objects – String Attributes – *Miscellaneous Functions*.

Note : Italics denotes Topics for Self Study

TEXT BOOK

1. Ashok N Kamthane, *Object Oriented Programming with ANSI and Turbo C++*, Pearson Education Publ 2006.

REFERENCE BOOKS

1**. Balagurusamy E ,** *Object Oriented Programming With C++* - TMH Pub 1998.

2. **John R Hubbard ,** *Programming With C++* - TMH Publ. II Edition 2002.

3**. Maria Litvin and Gary Litvin** , *C++ For You* , Vikas Publ 2002.

SEMESTER III

Core Paper IV: Java And Network Programming

Instructional Hrs. : 75 **Sub. Code :15ITUC304**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective : To make the students understand the concepts of Java And Network Programming.

UNIT I **15 Hrs.**

An Overview of Java: A First Simple Program – Data Types – The Primitive Types – Type Conversion and Casting – Automatic Type Promotion in Expressions. Introducing Classes – A Closer Look at Methods and Classes. **Inheritance:** Inheritance Basics – Using Super – Creating a Multilevel Hierarchy – When Constructors Are Called – Method Overriding – Dynamic Method Dispatch – Using Abstract Classes – Using Final with Inheritance – The Object Class.

UNIT II **15 Hrs.**

Packages and Interfaces: Packages – Access Protection – Importing Packages – Interfaces. Exception Handling: Exception Handling Fundamentals – Exception Types – Uncaught Exceptions – Using Try and Catch – Multiple Catch Clauses – Nested Try Statements – Throw – Throws – Finally – Java's Built-in Exceptions – Creating Your Own Exception Subclasses.

UNIT III **15 Hrs.**

Multithreaded Programming: The Java Thread Model – The Main Thread – Creating a Thread – Creating Multiple Threads – Using isAlive() and Join() – Thread Priorities – Synchronization – Interthread Communication – Suspending, Resuming, an Stopping Threads – Using Multithreading. **Networking:** Networking Basics – The Networking Classes and Interface – Inet Address – Inet4 Address and Inet6 Address – TCP/ IP Client Sockets – URL – URL Connection – Http URL Connection – The URL Class – Cookies – TCP/ IP Server Socket – Datagrams.

UNIT IV **15 Hrs.**

The Applet Class: Two Types of Applets – Applet Basics - Applet Architecture – An Applet Skeleton - Simple Applet Display Methods – Requesting Repainting – Using

the Status Window – The HTML APPLET Tag. **Event Handling:** Two Event Handling Mechanisms – The Delegation Event Model – Event Classes – Sources of Events – Event Listener Interfaces – Using the Delegation Event Model – Adapter Classes – Inner Classes.

UNIT V **15 Hrs.**

Introducing the AWT: AWT Classes – Windows Fundamentals – Working with Frame Windows – Creating a Frame Window in an Applet – Creating a Windowed Program – Displaying Information within a Window – Working with Graphics – Working with Color – Setting the Paint Mode. **Using AWT Controls, Layout Managers, and Menus:** Control Fundamentals – Labels – Using Buttons – Applying Check Boxes – Checkbox Group – Choice Controls – Using Lists – Managing Scroll Bars – Using a Text Field –Menu Bars and Menus.

Note : Italics denotes Topics for Self Study

TEXT BOOK

Herbert Schildt, Java: The Complete Reference, Tata McGraw-Hill Publishing Company Limited, New Delhi. Seventh Edition.

REFERENCE BOOKS

1. John R.Hubbard, Programming with Java, TMH Publ, 1999.

2. Xavier C , Programming with Java 2, SciTech publ, 2000.

SEMESTER III

Core Paper VI: Software Engineering

Instructional Hrs. : 75 **Sub. Code :15ITUC306/ 11CSUC511/ 08CAUC511/ 08CTUC511**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective : To make the students understand the concepts of software engineering

UNIT I **15 Hrs.**

Introduction – The evolving role of software - software crisis – software myths – software engineering layered technology- *software process*- software process models – prototyping model- Evolutionary software process models.

UNIT II **15 Hrs.**

Analysis concepts & Principles: Requirements analysis and elicitation for software – Analysis principles - *software prototyping* – specification. **Analysis Modeling :** data modeling – functional modeling and information flow – behavioral modeling.

UNIT III **15 Hrs.**

Design Concepts & Principles: The design process – design principles – design concepts – effective modular design. User Interface Design – The golden rules – UID – *Task analyzing and modeling* – Interface Design Activities – Implementation Tools – Design Evaluation.

UNIT IV **15 Hrs.**

Component level design: Structured Programming – Comparison of Design notations Software testing techniques – Software testing fundamentals – Test case design - *White box testing* – Basis path testing – control structure testing – Black Box testing.

UNIT V **15 Hrs.**

Software testing strategies – A strategic approach to software testing - Unit Testing – Integration testing – *validation testing* – system testing **- Object oriented Design:** Design for Object Oriented Systems – System Design process – The object Design Process.

Note: Italics denotes Self Study Topics

TEXT BOOK

1. **Roger S.Pressman**, S*oftware Engineering,* TMH Publishers ,5th Edition.

REFERENCE BOOKS

1. **Ian Somerville ,** Software Engineering, Pearson Education Publ, 6th Edition, 2001.
2.**Watts S. Humphery**, *A discipline for Software Engineering*, Pearson Education Publishers, 2001.

SEMESTER IV

Allied Paper IV: Software Project Management

Instructional Hrs. : 75 **Sub. Code : 15ITUA404**

Max. Marks : CIA -25; ESE -75 **Credits: 5**

Objective : To make the students understand the concepts of Software Project Management

UNIT I **15 Hrs.**

Introduction-Software projects versus other types of project-Problems with projects - Stakeholders–An overview of project planning –Project evaluation- Technical plan content list – Software effort estimation.

UNIT II **15 Hrs.**

Activity planning- project schedules- projects and activities-sequencing and scheduling activities-network planning model- shortening the project duration-identifying critical activities.

UNIT III **15 Hrs.**

Risk management-resource allocation-Monitoring and control-Managing people and organizing teams-planning for small projects.

UNIT IV **15 Hrs.**

Software configuration management-Introduction -The Processes and Activities of Software Configuration Management-Configuration Status Accounting-Configuration Audit-Software Configuration Management in Geographically Distributed Teams-Metrics in Software Configuration Management- Software Configuration Management Tools and Automation.

UNIT V **15 Hrs.**

Case study – Prince Project management.

Note : Italics denotes Topics for Self Study

TEXT BOOK

1. Gopal Samy Ramesh, Managing Global software projects, TMH publ, 2002.

2. Mike Cotrell, Bob Huges, Software Project Management, Inclination/Thomas computer press, 1995.