

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES  
DEVI AHILYA UNIVERSITY, INDORE**

**MCA (6 Years)**

**VI SEMESTER**

**JANUARY – MAY 2013**

Subject Code	Subject Name	Credits
IC-601	Principles & Practices of Management	4
IC-602	Data & Computer Communication	4
IC-603	Java-I	4
IC-604	System Analysis & Design	4
IC-605	Analog Electronics	4
IC-606	Project	3
IC-607	Lab	3
IC-608	Comprehensive Viva	4

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE**  
**MCA (6 Years) VI SEMESTER**

**IC-601: Principles & Practices of Management**

**Aim of Course:** To provide an opportunity for the participants to understand the various methods of management techniques and eventually develop skills in problem solving and decision-making.

**Objectives:**

The course is designed to make students:

- Understand basic functions of management: planning, organizing, leading, and controlling.
- Understand the theories of contemporary organizations from a conceptual, analytical, and pragmatic perspective.

**Course Contents:**

**UNIT I**

Introduction– What is Management, Definition of management, Functions of Management, Principles of Management, Is management Art or Science. Management Thoughts – The Classical School, the Human relation School, the Decision Theory School, The Management Science School, The System Theory School, The Contingency Theory School

**UNIT II**

Planning – The Concept, Nature, Type, Steps and Principles of Planning, Instruments of Planning, Strategies Rules, Procedures, Methods, Standards, Projects and Budgets. Decision Making- Nature, Theories, Types, Process of Decision Making, Group Decisions

**UNIT III**

Organizing & Directing Organization and Organization Structure, Process of Organizing, Departmentation, Line Staff & Lateral Relation, Directing or Actuating.

**UNIT IV**

Motivation and Communication Need Concept, theories of Motivation, Meaning, Importance, Process, Barriers and Strategies for Communication.

**UNIT V**

Leadership- Tasks of Leaders, Meaning, Approaches. Coordination & Control Concept, Nature, Types, Methods of Coordination, Management Control, Types, Principles, Techniques of Controlling

**Reference Books:**

1. Koontz, Management-A global Perspective
2. Dr. R D Agrawal , Organization and Management

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**IC-602: Data & Computer Communication**

**Aim of Course:** To gain an understanding of the fundamentals of data communications networks.

**Objectives:**

The course is designed to make students:

- Understand basic data communication components.
- Understand the fundamentals of signaling and data transmission.
- Study data link layer and data link protocols.
- Study Network layer, MAC sub layer, LAN and its standards To introduce the basic concepts of microprocessor and assembly language programming.

**Course Contents:**

**UNIT I**

Introduction & Overview of Communication Systems Use of Computer N/W, N/W Hardware.

Layered Network Architecture: N/W Software.

Review of ISO OSI Reference Model: OSI Model, The TCP/IP Model, Comparing and Contrasting the OSI & TCP/IP Model.

Basis for Data Communication:- Guided Transmission Media: Twisted Pair, Coaxial Pair, Fiber Optics. Multiplexing Techniques: FDM, WDM, TDM, STDM. Unguided Transmission Media: Wireless Communication, Cellular Radio, Satellite Communication

**UNIT II**

Data Encoding: Digital Data, Digital Signal: NRZL, NRZI, Bipolar AMI, Pseudo Ternary, Manchester, Differential Manchester, B8ZS, HDB3. Digital Data, Analog Signal: ASK, FSK, PSK. Analog Data, Digital Signal: PCM, PAM, DM, ADM. Analog Data, Analog Signal: AM, FM, PM

**UNIT III**

The Data Link Layer : DLL Design Issue: Framing, Character Count, Character Stuffing, Bit Stuffing, Physical Layer Coding Violation, Error Control, Flow Control, Error Correcting Codes, Error Detecting Codes, Hamming Codes, CRC Code. Data Link Protocols:- Stop & Wait Protocol: Unrestricted Stop & Wait Protocol, Simplex Stop & Wait Protocol, Protocol for Noisy Channel. Sliding Window Protocol: Go Back n, Selective Repeat, Verification using File State, HDLC Data Link Protocol, ISDN: Services, Architecture, Interfaces, Devices. ATM: Architecture, Cells, Headers, Layers.

**UNIT IV**

The Medium Access Sub Layer : The Medium Access Sub Layer: Channel Allocation, Static, Dynamic. Multiple Access Protocols: ALOHA, CSMA, Collision Free Protocols, Limited Connection Free Protocols, WDMA, Wireless LAN Protocols. Digital Cellular Radio.

Local Area Network :- IEEE Standards: IEEE Standard 802.3, IEEE Standard 802.4, IEEE Standard 802.5, Comparison of 802.3, 802.4 & 802.5, IEEE Standard 802.6, IEEE Standard 802.2

Bridges: Bridges from 802.x & 802.y, Transparent Bridge, Source Routing Bridges, Comparison of 802 Bridges, Remote Bridges. FDDI

**UNIT V**

Network Layer N/W Layer Design Issue: Organization, Virtual Circuit, Datagram

Routing Algorithm: Shortest Path Algorithm, Flooding, Flow Based Routing, Distance Vector

Routing, Link State Routing, Hierarchical, Mobile Host. Broadcast & Multicast

**Reference Books:**

1. A.S. Tanenbaum, Computer Network (III Edition).
2. B.A. Forouzan, Data Communication and Networking (II Edition).
3. William Stalling, Data and Computer Communication.

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**IC-603: Programming in Java**

**Aim of Course:** To learn the Java programming language fundamentals: its syntax, idioms, patterns, and styles with object oriented programming concepts.

**Objectives:**

The course is designed to make students:

- Write programs using the Java language. Basic topics considered are programs and program structure in general, and Java syntax, data types, flow of control, classes, methods, objects, arrays, exception handling, recursion, and graphical user interfaces (GUIs).
- Compile and execute them under the Sun Microsystems, Inc. Java 2 Platform, Standard Edition, or other Integrated Development Environments (IDEs) such as NetBeans. To provide a broad exposure to the computer graphics field and understand the development of computer graphics applications.

**Course Contents:**

**UNIT I**

Introduction to Java: Features of Java, Object-oriented programming overview, Introduction of Java Technologies, How to write simple Java programs, Data Types, Variables, Memory concepts, decision making operators, Naming Conventions Introduction to Class, Objects, Methods and Instance Variables, Primitive type Vs Reference Type, Initializing Objects with Constructors. Type conversion & casting, Operators, Control Statements (if Single-Selection Statement, if-else Double Selection), while Repetition Statement, for Repetition Statement, do-while Repetition Statements, switch Multiple-Selection Statement, break and continue Statements. Static Method, static field and Math Class, Method Call Stack and Activation Record, Argument Promotion and Casting, Scope of declaration and Method Overloading.

String Handling & Arrays: String Handling: The String constructors, String operators, Character Exaction, String comparison, String Buffer.

Arrays: Declaring and Creating Arrays, Enhanced for Statement, Passing Arrays to Method, Multidimensional Arrays, Variable-Length Argument lists, Using Command-line Arguments. final Instance Variables, this reference, static import, overloaded Constructors, Garbage collection and method finalize , Overloading methods, Parameter passing.

**UNIT II**

Inheritance & Polymorphism: Inheritance: Extending classes, protected Members, relationship between Superclasses and Subclasses, Using super, Constructor in Subclasses, The Object Class, Object Copying in Java

Polymorphism: Method overriding, upcasting, Dynamic Method Dispatch, final Method and classes, Abstract classes and Methods, instanceof operator, Downcasting, Class class, Runtime type Identification.

Packages and Interfaces: Packages: Defining a Package, Understanding CLASSPATH, Access Protection, Importing packages, creating own packages.

Interfaces: Defining an Interface, Properties of interface, advantages of interface, Achieving multiple inheritance through interfaces, Variables in Interfaces, Comparable interface.

**UNIT III**

Nested Classes & Exception Handling: Nested Classes: Overview of nested class and interfaces, static nested class and interfaces, non-static nested class and interfaces –member class, local

classes, anonymous classes

Exception Handling: Introduction, overview of doing it and keywords used, when to use it, Java Exception Hierarchy, finally block, chained exceptions, declaring new exception types, preconditions and post conditions.

Streams and Files: Introduction to Data Hierarchy, Files and Streams, Sequential-access Text Files, Object Serialization, Random-Access files, Java Stream class Hierarchy.

#### **UNIT IV**

Multithreading: What are threads, The java thread model, Thread priorities, Thread life cycle, Creating thread and executing thread, Thread Synchronization, producer-consumer problem without Synchronization. Producer-consumer problem with Synchronization, Other class and Interfaces in java.util.concurrent, Monitor and Monitor Locks, Thread Groups, Synchronization, Inter-thread Communication.

Introduction to GUI & Applets: Introduction To GUI : Introduction, Overview of swing Components, Displaying text and Images in a window, Introduction to Event Handling, Common GUI Event Type and Listener Interfaces, How Event Handling Works, Adapter Classes, Layout Managers

Applets: Applet basics, Applet Architecture, Applet life cycle methods, Applet HTML Tag and attributes, Executing applet in web browser and in the appletviewer, in Passing parameters to Applets, doing GUI programming in applet.

#### **UNIT V**

Generic & Collection: API Generic: Introduction, Motivation for Generic Methods, Generic Methods : Implementation and Compile- time Translation Issues, Overloading Generic Methods, Generic Classes, Raw Types, Generic and Inheritance

Collection API: Introduction, Collection overview, Interface Collection and class Collection, List- ArrayList, LinkedList, Vector, Stack Class.

Database connectivity: JDBC, The design of JDBC, Typical uses of JDBC, The Structured Query language, Basic JDBC Programming concepts, Executing Queries.

#### **Reference Books:**

1. Deitel & Deitel, JAVA How to Program, Pearson Education, Sixth Edition
2. Herbert Schildt , Java2 : The Complete Reference, Tata McGraw- Hill, 4<sup>th</sup> Edition
3. John Hubbard , Programming with Java (Schaum's Easy Outline)
4. JAVA 2 Black Book
5. Bruce Eckel , Thinking in Java, Prentice Hall
6. Gary Cornell, Cay Horstmann Core Java 1.2: Volume 1 Fundamentals, Prentice Hall
7. The Sun Microsystems Press Java Series
8. Janson Hunter, William Crawford, Java Servlet Programming, O'Reilly Pub.

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**IC-604: System Analysis & Design**

**Aim of Course:** To introduce established and evolving methodologies for the analysis, design, and development of an information system.

**Objectives:**

The course is designed to make students:

- Understand system characteristics, project management, prototyping, and systems development life cycle phases.
- To analyze a problem and design an appropriate solution using a combination of tools and techniques

**Course Contents:**

**UNIT I**

Overview of system analysis and design: Systems concepts, Definition, Characteristics of a system, Elements of a system, Types of Systems: Physical or Abstract System. Open or Closed Systems. Man-Made Information Systems: Categories of Information, Formal Information Systems, Informal Information Systems.

**UNIT II**

System Development Life Cycle: Recognition of need, Feasibility study, Analysis, Design, Implementation, Post implementation and Maintenance, Project Termination, Prototyping, Role of the system Analyst: Definition, Skills, Academic and Personal Qualifications, The Multifaceted Role of The Analyst, The Analyst/User Interface.

**UNIT III**

System Analysis: Systems Planning and the Initial Investigation-Bases for Planning in System Analysis: Dimensions of Planning, Initial Investigation: Needs Identification, Strategies for Determining Information Requirements, Problem Definition and Project Initiation, Background Analysis: Fact- Finding, Fact Analysis, Determination of Feasibility.

Structured Analysis: Introduction, Tools of Structured Analysis: Dataflow Diagrams, Data Dictionaries, Decision Tables, Decision Trees, Structured English.

Feasibility study: Introduction, Feasibility Considerations, Feasibility Study Stages, Feasibility Report, Cost/Benefit Analysis.

**UNIT IV**

System Design: The Process and Stages of System Design: Introduction, The Process of Design: Logical and Physical Design, Design Methodologies: Structured Design, Form-Driven Methodology- The IPO Charts.

Input/Output and Forms Design: Introduction, Input Design, Output Design, Forms Design.

File Organization and Data Base Design: Introduction, File Structure, File Organization, Data Base Design, Views of Data, Data Structure.

**UNIT V**

System implementation, Post Implementation and Maintenance:

Introduction, Testing objectives, Test Data, System Testing, Types of System Tests, Quality Assurance: Quality Factors Specifications, Levels of Quality Assurance, Post Implementation and Maintenance, Project Scheduling , Project Management.

**Reference Books:**

1. Elias M. Awad , System Analysis and Design, GALGOTIA Publications.

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**IC-605: Analog Electronics**

**Aim of Course:** To enable students understand operational amplifiers.

**Objectives:**

The course is designed to make students:

- Understand working of amplifiers.
- Understand amplifier circuits, feedback circuits, and oscillator circuits To teach basic numerical methods required for typical engineering and business applications..

**Course Contents:**

**UNIT I**

Amplifier Circuits: Overview of BJT DC biasing techniques: Fixed bias, emitter stabilized bias, voltage divider bias. BJT Small signal analysis: Common emitter fixed bias, voltage divider bias, emitter follower.

**UNIT II**

Frequency Effects: Frequency response of an amplifier: Input & Output coupling capacitor, emitter and collector bypass capacitor, Miller's theorem, decibel voltage gain, cascading of stages.

**UNIT III**

Operational Amplifier: Differential and common mode operation, Non-inverting and inverting amplifiers: summing amplifier, integrator, and differentiator. Op-Amp specifications: DC offset parameters, frequency parameters.

**UNIT IV**

Feedback circuits: Concept of feedback, Feedback connection types, effect of feedback on gain and bandwidth.

**UNIT V**

Oscillators circuits: Operation, Phase Shift, Wein Bridge, Tuned and Crystal oscillators

**Reference Books:**

1. Electronic Devices and Circuit theory by Robert Boylestad & Louis Nashelsky.
2. Electronic Principles by A. P Malvino.