

Course Name: Java

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Eng-1	English	80
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Total No. Of Hours		640

Module No	Eng-1
Module Name	Basic English
Objective	To develop confidence and fluency in five key communication contexts: Socializing, Telephoning, Presentation, Participating in meetings & Handling negotiations
Pre-Requisites	Basic language skills in Reading, Writing, Listening and Speaking.
Contents	<p>The Course focuses on application of English Language in the day to day situations in general (conversational English) as well as in the Real World Business context (Business English)</p> <p>The focus is on Speaking, Listening and Reading Skills.</p> <p>The Teaching methodology is based on Interactive communicative role plays, activities, picture reading, pair work, group discussions and presentations.</p>

Module No	IT-1
Module Name	Software Engineering
Objective	Able to apply modern concepts of software engineering like software project management, measurement and evaluation of software development, and methods for improving software development processes.
Pre-Requisites	General knowledge of information systems, programming and statistics, Students must be proficient in reading, writing and comprehending the English language.
Contents	
	Introduction to SE
	The software process
	SDLC
	Artificats at various SDLC phases
	Requirement analysis
	Software implementation and maintenance
	Software testing
	SQA
	Configuration management
	Software process and project metrics
	Design concepts
	RUP & RAD
	Case studies:
	Provident fund calculation
	Food order automation
	Network based common mailing system
	Digital library for research papers

Module No	IT-2
Module Name	Object Oriented Programming
Objective	To understand why OOP is a superior set of methods for developing large, complex business systems
Pre-Requisites	Knowledge of structured programming concepts Fluency in the basics of the software development process Basic knowledge in C or Pascal
Contents	Introduction to Object Oriented Concepts through C++ Object, Class Inheritance, Encapsulation Polymorphism Composition Evolution of OO Languages Attributes and Methods Concepts of Static & Dynamic binding The concept of scope Access Designation Constructors Concept of Inner and Static Classes Inheritance & Multiple Inheritance Inheritances in C++ / JAVA Interfaces The Implementation Object Behavior Error Handling Operator overloading Object Operations C++ programming

Module No	IT-3
Module Name	Unified Modeling Language
Objective	Develop particular attention to practical techniques, Emphasizes the most practical analysis and design methods including the application of use case analysis, CRC analysis, problem domain analysis, activity diagramming, interaction diagramming, and class diagramming
Pre-Requisites	Knowledge of structured programming concepts, Basic C, C++ Programming , Understanding of OOPs Concepts
Content	Visual Modeling
	History of UML
	UML Diagrams
	Use Case
	Activity
	Sequence
	Collaboration
	Class
	State chart
	Component
	Deployment
	Software Architecture (Multi-tier architecture)
	Code Generator Tools & Reverse Engineering

Module No	IT-4
Module Name	Design Patterns and Software Design
Objective	Understand the effectiveness of Design Pattern at Software Design
Pre-Requisites	Knowledge of structured programming concepts, Basic C, C++ Programming , Understanding of OOPs Concepts
Contents	
	Introduction
	* Creational Patterns
	Proto Type
	Builder
	Factory Method
	Singleton
	* Structural Patterns
	Adapter
	Bridge
	Composite
	Façade
	Proxy
	* Behavioral Patterns
	Command
	Iterator
	Mediator
	Observer
	State
	Strategy
	Template Method
	* Additional Patterns
	.net & J2EE
	* Examples and Practice

Module No	CC-1
Module Name	Cross Culture Communications
Objective	Enable the participants to understand how culture influences communication and reasoning styles, motivation, professional and social relationships, business protocol and practices, and personal lifestyles.
Pre-Requisites	Students must be proficient in reading, writing and comprehending the English language TOEIC above 450+, working in a team for at least a year
Contents	* Understanding culture
	>> What is culture?
	>> The roots of culture
	>> Key cultural differences
	>> Developing cultural awareness
	* Intercultural issues
	>> Age
	>> Gender
	>> Regional affiliations
	>> Cultural identities, ethnic/linguistic and other affiliations
	* Language and communication in multilingual settings:
	>> Translation/transfer and lingua franca communication
	>> Meta-linguistic skills
	>> Socio-linguistic dimension and psycholinguistic dimensions
	* Management skills: internal and external
	>> Internal:
	# Team development
	# Mediation
	# Leadership and membership issues
	# Distribution of labour
	# Working on the task
	# Self-evaluation
# Guiding meetings etc.	
>> External:	
# Dealing with the organizational environment	
# Managing the interface between the team and the organizational environment	
# Contracting with initiators, donors, clients, institutions, authorities	
# Conflict management	
# Negotiating resources	

Module No	IT-5
Module Name	Data Structures in C++
Objective	Provide a fundamental grounding in the creation and manipulation of key data structures used in writing systems software and applications software.
Pre-requisites	Knowledge of structured programming concepts, Familiarity with operating system environment, Ability to create and edit text files, Basic Programming in C++

Contents	Overview of Data Structures * Data Structure * Abstract Data Type
	Array
	Linked List * Singly Linked List * Doubly Linked List * Circular Linked List
	Stack * Stack Using Linked List
	Queue * Queue Implemented Using Array
	Tree * Binary Tree * Tree Traversal
	Graph Terminology * Path * Types of Graph * Graph Representation * Searching Methods
	Templates * Function Templates * Class Templates * STL

Module No	IT-6
Module Name	Database Concepts and Oracle 9i
Objective	Understand the Oracle 9i architecture components , familiar with the tools and utilities of 9i, Understand PL/SQL and SQL*PLUS
Pre-requisites	Proficient in reading, writing and comprehending the English language, General knowledge of information systems and basic knowledge of programming.
Contents	Introduction to Database Management Systems Oracle Architectural Components Creating and Managing Tables Including Constraints Manipulating Data Writing Basic SQL select statements Restricting and sorting Data Single-Row Functions Aggregating Data Using Functions Displaying Data from Multiple Tables Subqueries Other database Objects Creating Views Overview of PL/Sql Test , Discussion & QA

Module No	IT-7
Module Name	Operating Systems
Objective	To Focus on the inner workings of the various operating systems and operations with a focus on practical application in a real-world environment
Pre-requisites	Knowledge of structured programming concepts, Familiarity with operating system environment, Ability to create and edit text files, Basic Programming in C / C++
Contents	Types of Operating Systems 1. What is Operating System & different OS views 2. Types of Operating Systems >> Mainframe Systems >> Desktop Systems >> Microprocessor Systems >> Distributed Systems >> Real-Time Systems >> Handheld Systems 3. Computing Environments 4. Storage Structure & Storage Hierarchy 5. Caching, Coherency & Consistency 6. Operating system Components & Services 7. Program Execution & I/O Outputs 8. File-System Manipulation 9. Communications & Error Detection 10. Resource Allocation 11. Accounting & Protection 12. Process, Threads & Process Scheduling
	7.0 Schedulers 1. Schedulers 2. Context Switch 3. Process Creation & Termination 4. Cooperating Processes 5. CPU Scheduling 6. Preemptive & Non Preemptive Scheduling 7. Scheduling Criteria & Algorithms 8. Deadlock & Mutual Exclusion 9. Hold and Wait 10. No Preemption & Circular Wait
	Synchronization & Monitors 1. Synchronization 2. The Critical-Section Problem 3. Semaphores & Critical region 4. Monitors 5. Instruction Execution Cycle 6. Address Binding 7. Logical vs. Physical Address 8. Dynamic Loading & Dynamic Linking 9. Swapping 10. Memory Allocation 11. Storage Placement 12. Policies 13. Compaction 14. Paging 15. Segmentation 16. Virtual memory 17. Demand Paging 18. Page Replacement
	File Concept & I/O Systems 1. File Concept 2. File Attributes 3. Disk Partitioning 4. Disk Partitioning 5. I/O Systems 6. Application I/O Interface 7. Block and Character Devices 8. Kernel I/O Subsystem 9. Disk Structure & Management 10. Booting 11. Swap Space Management
	System Architecture 1. System Architecture 2. Simplified System Architecture 3. Environment Subsystems 4. Role of Subsystem Components 5. Image Headers 6. Native Images 7. API Differences 8. Where is the Code? 9. Objects and Handles
	Networking 1. Network Management & Topologies a. Network Management: i. Server, Client & Peer to Peer ii. Users, Administrator and Guest Accounts b. Network Topologies: BUS, Star, Ring c. Types of Network: LAN, MAN and WAN 2. Network Device & Technologies a. Large Networks: Repeaters, Hubs, Routers, Gateways b. Access Methods: CSMA/CD, Token Passing c. Network Technologies: Token Ring, ATM, FDDI, Frame Relay, Auditing 3. Network Layer Functions & Routing Protocol a. Network Layer Functions b. Data Gram Networks c. Routing Protocol & Algorithms d. Distance Vector Routing & Algorithms e. Comparison of LS and DV Algorithms
	Transport services, protocols & Reliability model 1. Transport services and protocols 2. Principles of reliable data transfer 3. Temporary redundancy model 4. Reliability model a) RDT 2.0 F: SSM Specification b) RDT 2.1: senders, Receivers, Handles grabbed ACK \ NAKs c) RDT 2.2: NAK-free Protocol
	Test, Discussion & QA

Module No	IT-8
Module Name	Introduction to Software Testing Concepts
Objective	Should be able to understand Testing, Different phases in SDLC, able to write sample test cases
Pre-Requisites	Understanding of SDLC-all phases
Contents	Software Quality Management..... a. What is software Quality? b. Quality Management Activities i. Quality Assurance ii. Quality Planning iii. Quality Control c. Difference between QA and QC d. Verification & Validation
	Introduction to Software Testing • Objectives of software testing • Role of software testing • Benefits from software testing • Preventive and corrective actions • Testability, Test factors, Product Success criteria
	Testing Vs SDLC Types of Tesing • Unit testing • Code Based Testing • Functional Testing • Non-Functional Testing • Requirement Based Testing • Mapping of activities with SDLC • Test Team and Team members • Activitis Involved
	Testing Documentation a. Format for Test cases b. Defect Reporting, c. Defect Life cycle d. Defect Tracking f. Tracebility Matrix
	Introduciton to Agile Practicals -Writing Test Cases a. Discussion of Sample Test Cases Study b. Assignment to write sample Test Cases- Reviews

Module No	IT9-J-1
Module Name	Core Java
Objective	To provide a foundation of core Java programming skills.
Pre-requisites	Knowledge of structured programming concepts, firm grasp of programming concepts such as: looping, branching, functions, passing arguments to functions and returning values from functions. Basic C, C++ Programming or Any OOPs Language.
Contents	<p>Introduction</p> <ol style="list-style-type: none"> 1. Introduction to Java Programming 2. Features of Java 3. The Java Virtual machine 4. Structure of a Java Program 5. Basic data types 6. Declaring variables 7. Scope and Lifetime 8. Control of flow statements 9. What is Eclipse? <p>Implementing OOP Principles</p> <p>Package and Interfaces</p> <p>Exception Handling</p> <p>AWT</p> <p>Swing</p> <p>Collections</p> <p>Multithreading</p> <p>JDBC</p> <p>I/O Streams</p> <p>Internationalization</p> <p>Networking</p> <p>Java Annotations</p> <p>Assertions</p>

Module No	IT9-J-2
Module Name	Enterprise Java
Objective	To gain knowledge and skills to begin developing server-side Java applications based on the Enterprise Java component technologies; Java Servlets, JavaServer Pages (JSP) and Enterprise JavaBeans (EJB). Emphasis is placed on techniques and practices to develop scalable, transactional and secure n-tier enterprise applications.
Pre-requisites	Knowledge of structured programming concepts, Programming Knowledge of Core Java Language
Contents	J2EE 1. Web Applications 2. J2EE Architecture
	Java Servlets
	Introduction to JDBC
	Java Bean
	Java Sever Pages
	Introduction to Struts framework
	Introduction to RMI
	Enterprise Java Beans
	EJB 3 Java Persistence API
	Java Security

Module No	IT-10		
Module Name	Mini Project - Design		
Objective	Should be able to relate and understand the practical usage of Design Patterns ,SDLC, UML given any development Module		
Pre-requisites	Knowledge of structured programming concepts, Basic C, C++ Programming , Understanding of OOPs Concepts, UML & SDLC		
Activities			
Contents	Day	Deliverables Created	
		Bussiness -line Requiremnt Specification (BRS) document is given to traines & each discussed with respective groups	
	1	Study and analysis of the requirements. Identifying the functional and non-functional requirements.	Software Requirements Specification document
	2	Work on the detailed functionality of the system. Explain in detailed the system functionalities	Use Case Diagrams, Use Case Specifications
	3	Identify the different classes needed for the system. Also document the communication within the system	Class Diagram, Sequence Diagram
	4	Refine the classes identified to make them independent and functional. Consider the implementation platform while modifying class structure	Detailed Class Diagram, Deployment Diagram
5	Finalize the documentation of the system. Prepare for presentation	Printout of the complete documentation. Prepare documents for presentation	

Module No	IT9-DNT-2 / IT9-J-3	
Module Name	Mini Project - Implementation	
Objective	Able to implement the application completely as per the SRS design in Mini Project - Design	
Pre-requisites	Understanding of SDLC, all Phases	
Contents	Day 1	GUI Designs
		Coding
	Day 2	Database Design
		Coding
	Day 3	Coding-Cont. & Final Code review / Use of Test Cases & Testing
	Day 4	Documentation Preparation- As a Complete Application
		Presentation