Software Engineering	
PART: 01	**Software Engineering**
	Introduction, Software Product, Process Activities and Ethics
01	Software Process, Activities, Rational Unified Process
02	Agile Software Development and Extreme Programming
03	Requirements Engineering, Specification, Validation and Management
04	System Modeling – Context, Interaction, Structural and Behavioral
05	Architectural Design Decisions, Views, Patterns and Applications
06	Design and Implementation, Design Pattern and Open Source Coding
	Test-Driven Development and Release, User and Software Testing
	Software Evolution and Maintenance, Legacy System Management
	Sociotechnical System, Complex System and System Engineering
	Security and Dependability, Safety, Availability and Reliability
	Dependability, Safety, Security and Reliability Specification
	Dependability Engineering and Programming Redundancy and Diversity
	Security Engineering, Management, Risk Assessment and Design
	Solid Principles in C# - Interview Question and Design Pattern in .NET – Coding Example
PART: 01	**Software Engineering (SE/SEPM)**
	Introduction to Software Engineering | Nature of Software
	Generic Process Model | Process Framework Activities with Examples
	SDLC with Real Life Example
	Waterfall Model Complete Explanation
	Iterative Development Model Complete Explanation
	Incremental Process Model Complete Explanation with Example
	Evolutionary Process Model Complete Explanation
	Prototyping Model Complete Explanation with Example
	Spiral Model Complete Explanation with Example
	Concurrent Model Complete Explanation
	Agile Model Complete Explanation with Example
	All SDLC Models Revision
	Functional vs Non-Functional Requirements with Examples | Requirement Engineering
	Requirement Engineering | Establishing Ground Work | Users vs System Requirement
	Requirement Engineering Tasks
	Requirement Engineering Process | Elicitation| Specification | Validation | Management
	Requirement Engineering Specification (SRS) | Complete Explanation with Example
	KANO Model: Prioritizing Requirements with Examples
	Requirement Models | Use Case | Activity | Class | Data Flow | State Diagram
	Data Modeling Types and Techniques with Examples
	Software Design | Quality Guidelines and Attributes with Examples
	Software Design Concepts with Examples
	Coupling and Cohesion with Examples
	User Interface Design Model Complete Cxplanation

	Architectural Design Model Complete Explanation
	Component Level Design Complete Explanation with Example
	Project Planning | Process with Examples
	Project Scope Management
	Work Breakdown Structure (WBS) with Example
	Project Scheduling Process, Principles and Techniques with Example
	Project Management Spectrum | 4P's with Example
	W5HH Principle with Example | Boehm's Principle
	Software Measurements and Metrics | LOC | FP
	Software Project Estimation with Examples
	Decomposition Techniques in Project Estimation
	Software Cost Estimation
	COCOMO Model with Solved Examples
	Risk Management in Software Engineering
	RMMM Plan with Example | Risk Mitigation, Monitoring and Management Plan
	Software Configuration Management (SCM) | Process | Repository with Examples
	Introduction and Principles of Software Testing
	White Box Testing Techniques with Examples
	Black Box Testing Techniques with Examples
	Black Box vs White Box Testing
	Unit Testing with Examples
	Integration Testing with Examples
	System Testing with Examples
	Acceptance Testing with Example | Alpha vs Beta Testing
	Verification vs Validation with Example
	Defect / Bug Life Cycle Complete Explanation
	Difference Between Software Testing and Debugging
	Software Quality Dimensions | Metrics | Factors | Quality Management with Examples
	Quality Assurance vs Quality Control
PART: 01	
	Software Engineering Syllabus Discussion
	What is Software Engineering and Its Evolution with Examples
	SDLC Life Cycle for Beginners with Real Life Example
	Classic Waterfall Model
	Iterative Waterfall Model with Example
	V Shaped Model with Examples (SDLC)
	Prototyping Model
	Incremental Model
	Evolutionary Model with Real Life Examples
	Spiral Model (SDLC)
	Agile in Software Engineering
	SCRUM Model in Software Engineering | Agile Technology
	Comparison of All SDLC Models | Waterfall, Iterative, Prototype, Spiral, RAD, Agile

	Software Requirements Engineering | Feasibility Study | Elicitation, SRS, Validation
	Functional vs Non-Functional Requirements
	Software Requirements Specification (SRS)
	User Requirements with Real Life Examples | User Requirement Specification
	What is DFD | How to Design DFD Symbols Examples Full Explanation
	Levels of DFD | 0-Level | 1-Level | 2-Level with Example
	Logical vs Physical DFD with Example
	Function Oriented vs Object Oriented Design Approach | Software Design Approaches
	Software Project Management (SPM) with Real Live Examples
	Risk Identification | Reactive vs Proactive Risk Management | Type of Risk with Real Life
	Risk Assessment with Examples | Risk Management
	Risk Control vs Risk Mitigation with Examples
	Basic COCOMO and Intermediate COCOMO with Numerical
	Critical Path Method (CPM) in Software Engineering
	Verification vs Validation in Software Engineering
	Types of Testing in Software Engineering | Levels of Testing
	Error Sending in Software Testing | with Numerical Explanation
	MCQs on Software Engineering
	Question on Cyclomatic Complexity
	Cohesion and Coupling in Software Engineering
	Unit Testing with Examples
	Integration Testing with Examples
	System Testing with Examples
	Types of System Testing
	White Box Testing with Example
	White Box vs Black Box Testing
	Statement Coverage Technique White Box Testing
	Condition Coverage in White Box Testing
	Data Flow Testing Technique in White Box Testing
	Boundary Value Testing | Black Box Testing
	Perfective, Preventive, Adaptive, Corrective Maintenance in Software Engineering
	MTBF vs MTTR | Mean Time Between Failure | Mean Time To Repair
	Reverse Engineering with Real Life Example
	Case Tools in Software Engineering
	Performance Testing with Real Life Examples
	Regression Testing with Real Live Examples
	Introduction to UML with Examples
	Use Case Diagram in UML
	Sequence Diagram in UML
	Activity Diagram in UML
	Class Diagram in UML | Banking System with Real Life Example
	Class Diagram in UML | Class vs Object UML Diagram with Real Life Example
	Object Diagram in UL | Class vs Object UML Diagram with Real Life Example

	RAD Model
	RAD Model in Software Engineering
	Function Point (FP) vs Line of Code (LOC) | Project Size Estimation
	Function Point Analysis (FPA) | Function Point with Real Life Example
	Function Point Calculation | How Project Estivation in Done Using FP
	Aggregation vs Composition in UML with Examples

Software Architecture	
PART: 01	**Software Design and Architecture**
	What is Software Architecture in Software Engineering
	Software Architecture in Software Design and Architecture
	Difference Between Software Architecture and Software Design
	Software Architecture Business Cycle Explained
	5 Factors Affecting Architecture | Factors Influencing Architecture
	Factors Affected by Architecture | Factors Influencing Architecture
	Importance of Architecture in Software Architecture and Design
	Software Architecture Activities | ABC Software Architecture Business Cycle
	Software Architecture Evaluation
	Architecture Pattern | Architecture Style in Software Engineering
	Reference Architecture | Domain Specific Architecture in Software Engineering
	Software Project Line Architecture
	ADL Architecture Description Language in Software Architecture
	Software Quality Attributes in Software Engineering
	Quality Attributes Scenarios in Software Architecture
	Quality Attributes Scenario Example in Software Architecture
	Availability Quality Attribute in Software Design and Architecture
	Modifiability in Software Architecture | Software Design and Architecture
	Performance Quality Attribute in Software Architecture
	Security Quality Attribute in Software Architecture
	Testability Software Quality Attribute in Software Design and Architecture
	Usability Quality Attribute in Software Architecture
	Software Architecture Qualities | Conceptual Integrity, Buildability, Correctness
	Availability Tactics in Software Architecture Qualities
	Fault Detection Availability Tactics in Software Architecture
	Fault Recovery and Fault Preparation | Availability Tactics in Software Architecture
	Fault Prevention Availability Tactics in Software Architecture
	Tactics Modifiability in Software Architecture
	Availability Tactics in Software Architecture
	5 Software Architecture Pattern
PART: 01	**Software Development Methodology**

	Software Development Methodology
	Traditional Development Methodology
	Agile Development Methodology
	Agile Model vs Scrum vs Extreme Programming
	Dynamic System Development Methodology DSDM
	Software Quality Model
	Mc Call Software Quality Model
	Boehm Software Quality Model
	ISO Software Quality Model
	FURPS Software Quality Model
	Components and Connectors in Software Architecture
	Master Slave Architecture
	Evolution of Software Architecture
	Software Architecture Model | True Engineer
	Structural Model in Software Architecture Model
	Complete Software Architecture Model for Engineering Exam
	Software Architectural Style | True Engineer
	Data Flow Architecture Pipes and Filter Architecture | True Engineer
	Call and Return Architecture Styles in Software Architecture
	Data Centered Architecture Styles in Software Architecture
	Layered Architecture Style Software Architecture
	Client Server Architecture Style
	Agent Based Architecture
	Micro-Service Based Architecture
	REST Architecture
	Software Architecture Description Language (ADLs)
	Jdbc Java Database Connectivity
	ODBC (Open Database Connectivity)
	MVC (Model View Controller)
	Hibernate in Software Architecture
	Corba in Software Architecture
	Java RMI in Software Architecture
	Role of UML (Unified Modeling Language)
	CBAM (Cost Benefit Analysis Method)
	ATAM (Architecture Analysis Tradeoff Method)
	ARID (Active Reviews For Intermediate Designs)
	Software Architecture Documentation | True Engineer
	Principle of Sound Documentation | True Engineer
	Documentation Package Using a Seven Part Template | True Engineer
PART: 01	**Software Architecture and Design**
	Getting the Basics – Software Architecture Introduction
01	Scaling Distributed Systems
02	Distributed Cache Explained

03	What is Event Driven Architecture (EDA Part-1)
04	The Saga Pattern in Micro-services (EDA Part-2)
05	What is Event Sourcing and CQUS (EDA Part-3)
06	What is Service Discovery
	Micro-services Security Architecture (+Cybersecurity Basis)
	Distributed System Design Introduction (Concepts and Challenges)
PART: 01	**Software and Web Application Architecture**
	Software Architecture | Architectural Patterns | Architecture and Design Patterns
	Layered / N-Tire Architectural Pattern
	Micro-services Architectural Pattern
	Micro-kernel Architectural Pattern
	Web Services - Demystified
	APIs | REST | REST APIs Demystified
	Server-less Architecture Explained
	Service-Oriented Architecture – SOA | Software / Web Application Architecture
	Distributed Systems | Distributed Computing Explained
	Event-Driven Architecture | EDA | Software Architectural Patterns
PART: 01	**Web Application Architecture**
	App Architecture – Understanding Frontend, Backend and Web Servers
	What is a Server – Web Server, Application Server
	What is a API
	Web Application Architecture – Load Balancing and Caching
	Web Application Architecture – Proxy and Reverse Proxy Servers
	What Are Micro-services – Web App Architecture
	What is Server-less | Cloud Computing Fundamentals
	App Architecture – Message Queues
	What is A Middleware
	What is A CDN
	Building Login Systems | Web Application Architecture
	Web Application Architecture – 2020 and Beyond
	Single Page Applications Architecture | Web Application Architecture Series
	Multitenant Architecture For SaaS Apps | Web Application Architecture
	Implementing Multitenancy In A SaaS Product | System Design

System Analysis and Design	
PART: 01	**System Analysis and Design**
	Introduction, Definition and Characteristics of System
	Elements of System with Notes
	Types of System with Notes
	System Analyst Skills and Responsibilities with Notes
	System Development Life Cycle SDLC with Notes
	Requirement Analysis with Notes
	Feasibility Study with Notes
	Information Gathering Tools Part-1
	Information Gathering Tools Part-2
	Cost Benefit Analysis with Notes
	Input Design
	Output Design
	Introduction to Modular and Structural Design
	Top Down, Bottom Up Approach, Module Attributes and Types
	Tools for Structured Design
	Design Considerations
	Coupling and Its Types
	Coupling
	Cohesion
	Relationship Between Coupling and Cohesion
	Introduction to Testing
	Types of Testing Part-1
	Types of Testing – Functional Testing
	Types of Testing – Non-Functional Testing
	System Testing
	System Implementation
	Quality Assurance
	Documentation
	Concept, Importance and Types of System Maintenance
	System Flow Chart
	Data Flow Diagram (DFD)
	Data Dictionary
	Decision Tree
	Decision Table
PART: 01	**System Analysis and Design**
	What is System Analysis | What is System Design
	What is System | Elements of System
	What is System | Types of System in SAD
	Who is System Analyst | His Qualities, Role and Responsibilities
	What is SDLC | Phases of SDLC | Importance of SDLC

	What is Feasibility Study | Types of Feasibility Study
	What is SRS Document | Feature or Characteristics of a Good SRS
	What is Structured Analysis | What is Structured Design
	What is Data Flow Diagram (DFD) | Types of DFD | Levels of DFD
	What is Data Dictionary | Types of Data Dictionary and Advantages
	What is Entity Relationship Diagram (ERD) | What is ER-Model
	SDLC Models | What is Waterfall Model | Advantages and Disadvantages
	What is Iterative Model | When to Use | Advantage and Disadvantage
	What is Prototype Model | When to Use | Advantage and Disadvantage
	What is Spiral Model | When to Use | Advantage and Disadvantage
	What are Information Gathering Tools
	Cost Benefit Analysis | Perform Cost Benefit Analysis
	Decision Tree | Decision Table
	Software Testing | Need of Software Testing and Importance
	Types of Software Testing | White Box Testing | Black Box Testing
	Functional Testing | Non-Functional Testing
	What is Software Design | Basic Principle of Software Design
	Coupling and Cohesion
PART: 01	**System Analysis and Design**
	Project Initiation
	Feasibility Analysis
	Project Selection
	Development Methodologies
	Project Management
	Managing the Schedule
	Managing Scope and Risk
	Managing Team Work
	Analysis Phase
	Requirement Types and Documentation
	Requirement Gathering Techniques
	Requirement Analysis Strategies
	What is a Use Case
	Approaching Use Case Analysis
	Use Case Elements and Styles with an Example
	Vision for Data Flow Diagrams and ER-Diagram
	Elements of a DFD
	DFD Levels and Checking Quality
	Design Phase Overview
	Acquisition Tools
	Acquisition Strategies
	Architecture Design
	Non-Functional Requirements Revisited
	HW-SW Specification

	UI Principles
	UI Design Process
	Navigation Mechanism
	Input Output Mechanisms
	Logical To Physical
	Program Design
	Moving to Implementation
	Managing The Programming Process
	Software Testing
	Documentation
	Post-Implementation
	Migration
	Conversion Strategies
	Change Management
	Characteristics of the OO Approach
	UML

Human Computer Interaction (HCI)	
PART: 01	
	Introduction of Human Computer Interaction (HCI)
	Goals of Human Computer Interaction
	Benefits and Functionalities of Human Computer Interaction | Good and Poor Design
	Components of Human Computer Interaction with Examples
	Multidisciplinary Fields in Human Computer Interaction
	User Centered Design (UCD) Process with Examples
	Principles of Human Computer Interaction with Example
	Input Output Channel in Human Computer Interaction with Examples
	Human Memory | Encoding and Retrieval Working | Model of Memory with Example
	Sensory Memory (Iconic, Echoic and Haptic Memory) with Example
	Long Term Memory (Episodic and Semantic Memory) with Example
	Type 3: Short Tem Memory with Examples
	General Factors Affecting on Human Memory with Examples
	Human Emotions with Examples | Emotions Recognitions
	Human Errors | Types | Sources | safety with Examples
	Individual Differences with Examples
	Thinking and Reasoning | Deductive | Inductive | Abductive Reasoning with Examples
	Problem Solving (Gestalt, Problem Space and Analogy Theory) Types with Examples

	Psychology, Design and Career Goals in Human Computer Interaction
	Interaction in Human Computer Interaction | Interaction Goals, Scope, Design
	Models of Interaction Framework (Abowed and Beale's Model) with Example
	Donald Norman's Model (Execution and Evaluation Loop Framework) with Example
	Ergonomics with Examples | Ergonomics vs Human Factors
	Interaction Styles Part-1 (Command Line Natural Language, Menu, Queries)
	Interaction Styles Part-2 (Form Fills, Spreadsheets, Point)
	WIMP (Windows, Icons, Menus and Pointers) Interface with Examples
	Paradigms of Interaction with Examples
	Interactivity and Context of Interactions with Examples
	Users Experience and Elements of User Experience with Example
	Career / Future in Human Computer Interaction Field
	Design and Interaction Design Process | Golden Rules and Frameworks
	HCI in Software Design Process (Models and Life Cycle)
	User Focus, Scenarios, Navigation Design, Screen Design and Layouts in HCI
	Prototyping Techniques with Examples Part-1
	Type of Prototyping Techniques (Low, Medium and High Fidelity) with Example Part-2
	Rapid Prototyping (online and Offline) Technique with Example Part-3
	Wire-Framing Technique with Examples
	Model-View-Controller (MVC) Working with Examples
	Principles That Supports Usability | Design Standards and Design Guide Lines
	Shneiderman's 8 Golden Rules with Examples
	Norman's 7 Principles | Nielsen's 10 Heuristic Design Principles with Examples
	User Interface Management System | The Seeheim Model | The PAC Model
	Evaluation Techniques | Evaluation Criteria with Examples
	Goal and Task Hierarchies Model | Linguistic Model | Physical and Device Model
	Hierarchical Task Analysis (HTA) Model with Examples
	Diagrammatic Dialog Design Notations | Computer Mediated Communication
	Identify and Observer Bad Designs
	The Jugad: To Identify Creative Things
	Feedback and Constraints (Identify Products Offering Feedback and Constraint)
	Create Paper Based Prototype and Wire Frame Using Software | Figma
	Evaluation of Interface (Evaluate Products as Per Shneiderman's 8 Golden Rules)
	Human Computer Interaction Research and Project Ideas