Software Engineering Methodologies

Session 1: System concept and Information System Environment

1. The system concept, characteristics of system, elements of system.
2. The System Development Life Cycle, The Role of System Analyst.
3. Introduction system planning & initial investigation, various information gathering tools feasibility study concretions & structures tools of system analysis.
4. Various methods of process design, form design methodologies, introduction to information system testing, quality assurance security.

Session 2: Software Process, Product and Project

1. The Product: Software, Software Myths.
2. The process: Software Engineering: A Layered Technology, Software Process Models, the Linear Sequential Model, The Prototyping Model, and The RAD Model.
3. Evolutionary Software Process Models, Component – Based Development, Fourth Generation Techniques, Software process and Project Metrics : Software measurement.

Session 3: Software Project Planning & Design

1. Software Project Planning: Project planning objectives, Decomposition Techniques, Empirical estimation models.
2. The Make/Buy Decision., Risk analysis.
3. Software Design: Design Principles, Cohesion & Coupling, Design notation and specification, structure design methodology.

Session 4: Software Quality Assurance and Testing

1. Software Quality Assurance: Quality Concepts, The Quality Movement, Software Quality Assurance.
2. Software Reviews, Formal Technical Reviews, Formal Approaches to SQA, Statistical Software Quality Assurance.
3. Software Reliability, Mistake Proofing for Software, Introduction to ISO standard.
4. Testing Strategies: A strategic approach of software testing strategic issues, unit testing, integration testing, validation testing, system testing.
5. The art of debugging. OOA, OOD.

Session 5: Advance Topics

1. MIS & DSS: Introduction to MIS, long range planning, development and implementation of an MIS, applications of MIS in manufacturing sector and in service sector.
2. Decision Support System concepts, types of DSS.
3. Object Oriented Software Engineering: Object Oriented Concepts, Identifying the Elements of an Object Model.
4. Management of Object Oriented Software Projects.
5. CASE tools, Re-engineering.

Book References

1. R. S. Pressman, “Software Engineering – A practitioner’s approach”, 6th ed., McGraw Hill Int. Ed.,2002.
2. Pankaj Jalote “Software Engg” Narosa Publications.
3. Ian Sommerville : Software Engineering 6/e (Addison-Wesley).
4. Richard Fairley : Software Engineering Concepts (TMH).