



**SE-567**

**SOFTWARE ENGINEERING FOR REAL TIME SYSTEMS**

**UNIT-I**

**Introduction:** Review of Software Engineering Concepts, Characteristics of Real Time Systems, Importance of including Time Factor, The Real Time System Life Cycle: Requirement Specifications, State Charts.

**UNIT-II**

**Structured Design Approaches:** Event Based Model, Process-Based Structured Design, Graph-Based Theoretical Model, Petri Net Models: Stochastic Petri Net (SPN) Model Analysis, Annotated Petri Nets, Time-Augmented Petri Nets, Assessment of Petri Net Methods.

**UNIT-III**

**Axiomatic Approaches:** Weakest Precondition Analysis, Real Time Logic, Time Related History variables, State Machines and Real-Time Temporal Logic.

**UNIT-IV**

**Language Support Restrictions:** Real-Time Programming Discipline, Real-Time Programming Languages, Schedulability Analysis.

**UNIT-V**

**Verification and Validation of Real-Time Software:** Testing Real Time Properties, Simulation as Verification Tool, Testing Control and Data Flow, Proof Systems, Operational Approach.

**Suggested Reading:**

1. Shem – Tow Levi and Ashok K. Agarwal, “Real Time System Design”, McGraw Hill International Editions, 1999.
2. Cooling J.E. Jim Cooling, “ Software Engineering for Real Time Systems” Addison Wesley