ECE 673 / SYST 620 Discrete Event Systems (3.0:3)
Prerequisites: ECE 521 or SYST 611 or equivalent

Introduction to modeling and analysis of discrete event dynamical systems. Course covers elements of discrete mathematics and then focuses on Petri Net models and their basic properties: locality and concurrency. Condition/event systems; Place/transition nets; Colored Petri nets; Reachability graphs (Occurrence nets); and Invariant Analysis. Temporal issues in Petri nets and Temporal Logic. Stochastic Petri nets. Relation to other discrete event models of dynamical systems. Applications of the theory to modeling and simulation and to systems engineering problems

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Course Call numbers: ECE 673 001 72494; SYST 620 00170803; SYST 620 632 76154

Fall 2005: M 4:30 – 7:10 pm   in Room IN 131 (Innovation Hall)

COURSE OUTLINE (subject to change)

8/29/2005	Introduction: Systems and Models; Petri Net basics
9/12/2005	Essential Features of Petri Nets
9/19/2005	Petri Net models and Definitions
9/26/2005	Colored Petri nets
10/3/2005	Introduction to Net Analysis: Reachability graphs (state space methods)
10/11/2005	Invariant Analysis – the Farkas algorithm
10/17/2005	Deconstruction using invariants (structural methods)
10/24/2005	Mid Term
10/31/2005	Design: The Lattice algorithm
11/7/2005	Temporal issues in Petri nets
11/14/2005	Modeling and simulation using Colored Petri nets
11/21/2005	Stochastic Petri nets
11/28/2005	Architecture related issues
12/5/2005	Relation of Petri net models to other discrete event models
12/12/2005	Final Exam

Reading and reference material:

Claude *Girault and Rudiger Valk: Petri Nets for Systems Engineering, Springer, Berlin 2003*

Detailed class notes by A. H. Levis

Student Evaluation Criteria: Homework 40%; Midterm 25%; Final 35%