SYST 621 / ECE 674 System Architecture Design (3.0:3)   Spring 2009
Prerequisites: SYST 520 and SYST 620 or permission of instructor

Description: Architecture design and representation and the methodologies used to obtain them. Approaches based on systems engineering constructs such as structured analysis and software engineering constructs such as object orientation are used to develop architecture representations or views and to derive an executable model of the architecture views. The roles of the systems architect and the systems engineer are discussed. Examples from current practice are used.

Instructor: Prof. Alexander H. Levis ST2 Room 261 703 993 1619   alevis@gmu.edu   M 2 -4 pm

Course Call numbers: SYST 621 001 13110; 618 17078; ECE 674 001

Spring 2009: M 4:30 – 7:10 pm   at IN 131

COURSE OUTLINE (subject to change as this is a revised course)

1/26/2009	Systems Engineering and Architectures
2/2/2009	Use Cases and UML Review
2/9/2009	DoDAF and related Architecture Frameworks
2/16/2009	OO design process; Operational View
2/23/2009	OO Design process – Systems View
3/2/2009	Loosely Coupled Systems and Service Oriented Architectures – Part I
3/9/2009	Spring Break
3/16/2009	Systems of Systems and Service Oriented Architectures – Part II
3/23/2009	Midterm
3/30/2009	Structured Analysis review (SYST 520)
4/6/2009	SA Design Process
4/13/2009	Model Concordance and Case Study
4/20/2009	Executable Models of Architectures
4/27/2009	Architecture Guidance – Architects and Systems Engineer
5/4/2009	Project Review
5/11/2009	Final Exam

Course notes will be made available for downloading through WebCT. There are five papers that cover some of the material in the course and present two examples.

1. H. Levis and L. W. Wagenhals, "C4ISR Architectures I: Developing a Process for C4ISR Architecture Design," Systems Engineering, Vol. 3, No. 4, Fall 2000
2. L. W. Wagenhals, I. Shin, D. Kim and A. H. Levis. "C4ISR Architectures II: A Structured Analysis Approach for Architecture Design," Systems Engineering, Vol. 3, No. 4, Fall 2000
3. M. P. Bienvenu, I. Shin, and A. H. Levis, "C4ISR Architectures III: An Object-Oriented Approach for Architecture Design," Systems Engineering, Vol. 3, No. 4, Fall 2000
4. Lee W. Wagenhals, Sajjad Haider, and A. H. Levis, "Synthesizing Executable Models of Object Oriented Architectures," Systems Engineering, Vol. 6, No. 4, 2003
5. Lee W. Wagenhals and A. H. Levis, "SOA, DODAF 1.5 and Executable Architectures," Systems Engineering, Vol. 12, 2009 (to appear)

Homework: There are weekly reading assignments and homework assignments. The class will be divided into teams of four persons each. *Grading:* Homework sets will count for 40% of the final grade. There will be an in-class midterm examination (30%) and an in-class final examination (30%).