George Mason University   **The Volgenau School of Engineering**

SYST 621 / ECE 674 System Architecture Design (3.0:3)   Spring 2013
Prerequisites: SYST 520 and SYST 620/ECE 673 or permission of instructor

Description: Architecture design and representation and the methodologies used to obtain them.
Approaches based on software engineering constructs such as object orientation and service oriented
architectures as well as systems engineering constructs such as structured analysis are used to design
architectures and then represent them in conformance with architecture frameworks such as DoDAF.
Executable models of the architecture are derived to be used for architecture evaluation. The roles of the
systems architect and the systems engineer are discussed. Examples from current practice are used.

Instructor: Prof. Alexander H. Levis   Nguyen Eng. Room 3245   Tel 703 993 1619

Best way to contact: alevis@gmu.edu

 Spring 2013: M 4:30 – 7:10 pm   Classroom: Nguyen Eng. 2608

COURSE OUTLINE (subject to change as the course progresses)

Date	L#	Topic
1/22/2013	L1	Systems Engineering and Architecture Design
1/29/2013	L2	The Unified modeling Language (UML)
2/5/2013	L3	SysML Review; The DoD Architecture Framework
2/12/2013	L4	Capabilities and Project Viewpoints; Operational Concepts and Use Cases
2/19/2013	L5	Rule and Dynamics modeling ; Object Oriented Architecture Design;
2/26/2013	L6	Operational and Data Viewpoints
3/5/2013	L7	Service Oriented Architectures and Services Viewpoints
3/12/2013		Spring Break
3/19/2013	L8	Systems Viewpoint and SysML
3/26/2013	L9	Executable Models of Architectures
4/2/2013	L10	Project presentations; BPMN
4/9/2013	L11	Issues in Architecture Evaluation
4/16/2013	L12	Structural methods
4/23/2013	L13	State Space methods
4/30/2013	L14	Evaluating Systems of Systems; Resilient Architectures
5/14/2013		Final Exam

Course notes and collateral readings will be made available for downloading through Blackboard.
There are also ten papers that cover some of the material in the course and present several examples.
No textbook is required; however, it will be a good idea to have a textbook on UML and Object
Oriented design

Homework: There are weekly reading assignments and homework assignments (architecture design and
evaluation).

Grading: Homework sets will count for 50% of the final grade. The midterm presentation will count for
10% of the grade, the final class presentation for 15%, and the in-class final examination for 25%.