

SYST 621 / ECE 674 System Architecture Design and Evaluation (3:0:3)

Spring 2018

Prerequisites: SYST 520 or ECE 550

*Description:* Architecture design and representation and the methodologies used to obtain them. Approaches based on system engineering constructs such as object orientation and service oriented architectures are used to design architectures and then represent them in conformance with an architecture framework such as DoDAF. Executable models of the architecture are derived to be used for architecture evaluation. Examples from current practice are used.

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SYST 621	ECE 674	System Architecture Design
<b>S18</b>		A H Levis
Date	L#	Subject
1/23/2018	L1	Introduction; The DoD Architecture Framework
1/30/2018	L2	Object Oriented Architecture Design Process; Operational Concepts and Use Cases
2/6/2018	L3	Capabilities Viewpoint, Operational and Data Viewpoints
2/13/2018	L4	Service Oriented Architectures; Physical Architecture Design
2/20/2018	L5	Services and Systems Viewpoints
2/27/2018	L6	Architecture Evaluation Concepts
3/6/2018	L7	Introduction to Petri Nets
3/20/2018	L8	Petri Net Invariants and Applications
3/27/2018	L9	Hierarchical Petri nets; Introduction to Colored Petri Nets
4/3/2018	L10	Executable Architecture Models; Information Processing and Decision Making Architectures
4/10/2018	L11	The Lattice Algorithm; CAESAR III; Adaptive/Morphing Architectures
4/17/2018	L12	Case Studies: Systems of Systems; Resilient Architectures
4/24/2018	L13	BPMN; Closure
5/1/2018	L14	Presentations
<b>5/15/2018</b>		<b>No Final Exam</b>

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. The following textbook is highly recommended; however, it will be a good idea to have a textbook on UML and Object Oriented Design if you don't have one already from other courses.

W.M.P. van der Aalst and C. Stahl, Modeling Business Processes - A Petri Net Oriented Approach, The MIT Press, 2011 (ISBN - 13: 978 - 0 - 262 - 01538 - 7)

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

*Grading:* Homework sets will count for 75% of the final grade. The final presentation will count for 25% of the grade.

The George Mason University Honor Code can be found at <http://oai.gmu.edu/the-mason-honor-code-2/>