George Mason University **Volgenau School of IT & Engineering**

SYST 520 Systems Engineering Design and Integration (3:3:0) Spring 2009.

Prerequisite: Graduate standing.

System design and integration methods are studied and practiced, including structured analysis and object-oriented based techniques. Life Cycle of Systems is addressed, including definition and analysis of life cycle requirements. Software tools are introduced and used for portions of the systems engineering cycle. The course includes the development process of functional, physical, and operational architectures for the allocation and derivation of component-level requirements for the purpose of specification production. Interfaces and development of interface architectures.

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Course Call numbers: SYST 520 001 13102
Spring 2009: Wednesday 4:30 – 7:10 pm Room 80 Enterprise Hall

COURSE OUTLINE (subject to change)

21 Jan 09	Overview of Systems Engineering; Approaches to Design, WebCT ; B1 & Notes
28 Jan 09	Systems Engineering Design Process; Structured Analysis; CORE; B2
04 Feb 09	Use cases, Process modeling: IDEF0, DFD: F11, FApp, B3 & B12.3
11 Feb 09	Data Modeling and Rule Modeling – Model Based SE – notes, F2
18 Feb 09	Requirements and Design Definition; B6
25 Feb 09	Functional Architecture; B7
04 Mar 09	Physical Architecture and Design; B8 and B9
08 Mar 09	Behavioral Models and Executable Model of Design; B12
25 Mar 09	Interface Design and System Integration and Quantification; B10 & B11
25 Mar 09	Mid Term Exams Due
01 Apr 09	Alternative Structural and Architectural Representations; B12. F15
08 Apr 09	The Systems Modeling Language: (SysML) Basic Concepts; F1 through F 3
15 Apr 09	The Systems Modeling Language: (SysML) Diagrams; F4 through F14
22 Apr 09	The Systems Modeling Language☹SysML) Modeling Examples F15, F16
29 Apr 09	Integrating SysML into Development and Organizational Environments, F17, F18
06 May 09	Final Take Home Exams Due (No Class)

Textbooks for Course (required):

(1) Dennis M. Buede, *The Engineering Design of Systems,* Wiley, 2000, NY (2nd Edition in Press)..
(2) Sanford Friedenthal, Alan Moore, and Rick Steiner, *A Practical Guide to SysML: The Systems Modeling Language*, Morgan Kaufman OMG Press (Elsevier) 2008.
In the Course Outline, Bx denotes chapter x in Buede; Fx denotes chapter x in Friedenthal

A plethora of contemporary literature available on the Internet concerning systems design, integration, and architecting and will be of much use. Experience will be gained in the Internet as a research tool during the course. A course web site on Blackboard Learning Systems (BLS CE6) will be operational and put to much use. We will gain experience in using the CORE software package for design and architecting. Other software will be briefly discussed. Detailed class notes (Overheads) will be provided. Student Evaluation Criteria: Homework 40%; Midterm 30%; Final 30%, APS 10 Nov 2008.