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

SYST 520 Systems Engineering Design and Integration (3:3:0) Fall 2008.

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.

Instructor: Andrew P. Sage, S&T II, # 311, 703-993-1506, asage@gmu.edu, Office Hours by Appt.

Course Call numbers: SYST 520 001 71922 and SYST 520 606 77619
Fall 2008: Wednesday 4:30 – 7:10 pm Room IN 131 (Innovation Hall)

COURSE OUTLINE (subject to change)

27 Aug 08	Overview of Systems Engineering; Approaches to Design, WebCT ; B1 & Notes
03 Sep 08	Systems Engineering Design Process; Structured Analysis; CORE; B2
10 Sep 08	Use cases, Process modeling: IDEF0, DFD: F11, FApp, B3 & B12.3
17 Sep 08	Data Modeling and Rule Modeling – Model Based SE – notes, F2
24 Sep 08	Requirements and Design Definition; B6
01 Oct 08	Functional Architecture; B7
08 Oct 08	Physical Architecture and Design; B8 and B9
15 Oct 08	Behavioral Models and Executable Model of Design; B12
22 Oct 08	Interface Design and System Integration and Quantification; B10 & B11
29 Oct 08	Mid Term Exams Due
29 Oct 08	Alternative Structural and Architectural Representations; B12. F15
05 Nov 08	The Systems Modeling Language: (SysML) Basic Concepts; F4 through F 14
12 Nov 08	The Systems Modeling Language: (SysML) Diagrams; F4 through F14
19 Nov 08	The Systems Modeling Language: (SysML) Design Process; F4 through F14
03 Dec 08	Integrating SysML into Development and Organizational Environments, F17, F18
10 Dec 08	Final Take Home Exams Due (No Class)

Textbooks for Course (required):

(1) Dennis M. Buede, *The Engineering Design of Systems,* Wiley, 2000, NY.
(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

The recent work Tim Weilkiens, *Systems Engineering with SysML/UML,* Morgan Kaufman OMG Press, 2008 is a useful reference but is not required.

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 13 July 2008.