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

SYST 520 Systems Engineering Design (3:3:0) Fall 2010.

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 the systems engineering cycle. Identification of preliminary architectures. Students are expected to develop a system design for a system using both the structured analysis and object-oriented techniques presented in class.

Instructor: Andrew P. Sage, School of Engineering 2240, 703-993-1506, asage@gmu.edu, Office Hours by Appt.

Course Call numbers: SYST 520 002 74836, also SYST 520 DL1 78519,
Fall 2010: Wednesday 4:30 – 7:10 pm Room 131 Innovation Hall

COURSE OUTLINE (subject to change)

01 Sep 10	Overview of Systems Engineering; Approaches to Design, Blackboard ; B1
08 Sep 10	Systems Engineering Design Process; Structured Analysis; CORE; B2
15 Sep 10	Use cases, Process modeling: IDEF0, DFD: F11, FApp, B3 & B12.3
22 Sep 10	Data Modeling and Rule Modeling – Model Based SE – notes, F2
29 Sep 10	Requirements and Design Definition; B6
06 Oct 10	Functional Architecture; B7
13 Oct 10	Physical Architecture and Design; B8 and B9
20 Oct 10	Behavioral Models and Executable Models of Design; B12
27 Oct 10	Interface Design and System Integration and Quantification; B10 & B11
27 Oct 10	Mid Term Exams Due
03 Nov 10	Alternative Structural and Architectural Representations; B12. F15
10 Nov 10	The Systems Modeling Language: (SysML) Basic Concepts; F1 through F 3
17 Nov 10	The Systems Modeling Language: (SysML) Diagrams; F4 through F14
01 Dec 10	The Systems Modeling Language (SysML) Modeling Examples F15, F16
08 Dec 10	Integrating SysML into Development and Organizational Environments, F17, F18
15 Dec 10	Final Take Home Exams Due (No Class)

Textbooks for Course (required):

(1) Dennis M. Buede, *The Engineering Design of Systems,* Wiley, 2009, NY (2nd Edition)..
(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) 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 including Enterprise Architecture. Detailed class notes (Overheads) will be provided. Student Evaluation Criteria: Homework 40%; Midterm 30%; Final 30%, APS 1 April 2010.