SYST 659 / IT 850 / SYST 850 Model Based Systems Engineering. (3:3:0). Fall 09. Prerequisites: SYST 520 or 619 or permission of instructor.

Model Based Systems Engineering (MBSE) is the formalized application of modeling to support the processes associated with a framework for the engineering of systems. This framework includes both the steps and the phases associated with systems planning and marketing; research, development, testing and evaluation; and system acquisition and production. The purpose of this course is to provide a description of some of the leading methodologies for MBSE and to illustrate their use in systems engineering and management. Use of MBSE to support a variety of systems engineering applications is described in the course. Studies in this area cover: formulation of the system integration problem, definition of architecture frameworks, use of structured analysis and object oriented methodologies for the design of architectures, modeling and simulation for evaluation of architectures and approaches to integration, and interoperability. Both defense and industrial applications are considered.

Text:

Sage, A. P. and Rouse, W. B. (Eds.), ***Handbook of Systems Engineering and Management***, Second Edition, John Wiley and Sons, New York, 2009.

We will use several chapters in this work, beginning with Chapter 0 to describe a systems engineering framework. Then we turn our attention to Chapter 32 which is specifically on model based systems engineering. Next, we examine systems modeling methodologies from many of the chapters in this work.

A plethora of contemporary literature available on the Internet concerning the subjects to be covered will be of much use, and experience will be gained in the Internet as a research tool during the course. A course web site on Blackboard will be operational and will be much used throughout the course.

Instructor: Andrew P. Sage, Office: Engineering Building, Room 2240, Phone: 703-993-1506, Fax: 703-993-1521
Email: asage@gmu.edu, Office Hours by Appointment.

Course Call Numbers SYST 659 002 (77022) IT 850 001 (77353) SYST 850 001 (777352) Fall 2009 Wednesday from 4:30 PM to 7:10 PM in Room L008 School of Art Building.

Grades: 50% - examinations; 15% - term paper; 35% - home assignments. Two take home exams will be given. There will be a term paper assignment in the general area of the course, and periodic homework assignments. The content in the detailed weekly syllabus is based on Chapters from the text.

SYST 659, IT 850, SYST 850 – Model Based Systems Engineering Syllabus and Outline, (subject to change)

2 Sept. 09	Framework for Systems Engineering and Management; Chapters 0 and 1
9 Sept 09	An Introduction to Model Based Systems Engineering Part 1 (Chapter 32)
16 Sept 09	An Introduction to Model Based Systems Engineering Part 2 (Chapter 32)
23 Sept 09	System Architecture Models and MBSE Part 1 (Chapter 12)
30 Sep 09	System Architecture Models and MBSE Part 2 (Chapter 12)
7 Oct 09	Modeling the Enterprise as a System (Chapter 10)
14 Oct 09	Requirement, Measurement, Human, and Design Model Issues (Chapters 4, 13, 15, 21)
21 Oct 09	Modeling and Analysis of Alternatives (Chapter 26)
28 Oct 09	Cost, Quality, Reliability, Availability, and Maintainability Models (Chapters 6, 7, 8)
28 Oct 09	Mid Term Exams Due
04 Nov 09	Modeling and Analysis of Alternatives and Decisions (Chapters 26, 27, 28)
11 Nov 09	Models for Human Systems Integration and Organizational Design (Chapters 31, 33)
18 Nov 09	Complex Adaptive System Models (Chapter 30)
2 Dec 09	Model Based Systems Engineering Summary and Principles (Part 1)
9 Dec 09	Model Based Systems Engineering Summary and Principles (Part 2)
16 Dec 09	Final Take Home Exams Due (No Class)

APS. 24 June 2009