

SYST 520 System Engineering Design (3.0:3)

Spring 2013

Prerequisites: Graduate standing

*Description:* 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 of their choice using both the structured analysis and object-oriented techniques presented in class and they will make presentations on these designs.

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Spring 2013: Thursdays 7:20 – 10:00 pm

On-line via Blackboard Collaborate

(accessible through <http://mymason.gmu.edu> )**COURSE OUTLINE** (subject to change as the course progresses)

| Date      | L#  | Subject  |
|-----------|-----|--|
| 24-Jan-13 | L 1 | Introduction to Systems Engineering; Design and Integration          |
| 31-Jan-13 | L2  | The Systems Engineering Processes:                                   |
| 7-Feb-13  | L3  | Operational Concepts and Use Cases; Modeling Languages Introduction  |
| 14-Feb-13 | L4  | Structured Analysis: Activity Modeling (IDEFO and DFD)               |
| 21-Feb-13 | L5  | Structured Analysis: Data Modeling (IDEF1x and E-RD)                 |
| 28-Feb-13 | L6  | Behavior Modeling: Rule Modeling and Dynamics Modeling (STD)         |
| 7-Mar-13  |     | Model Concordance, Functional Architecture                           |
| 14-Mar-13 | L7  | <b>Spring Break</b>  |
| 21-Mar-13 | L8  | Physical Architecture and System Design                              |
| 28-Mar-13 | L9  | <b>Midterm: Team Design Presentations</b>                            |
| 4-Apr-13  | L10 | Architecture Frameworks and Arch. Description Languages (UML, SysML) |
| 11-Apr-13 | L11 | OO Architecture Design: Functional Viewpoint                         |
| 18-Apr-13 | L12 | OO Architecture Design: System Viewpoint                             |
| 25-Apr-13 | L13 | Interface Design, Integration and Qualification                      |
| 2-May-13  | L14 | <b>Closure and Team Design Presentations</b>                         |
| 9-May-13  |     | <b>Final Exam</b>  |

**Required Textbooks:**(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*, The MK/OMG Press, (Elsevier) 2012 (2<sup>nd</sup> Edition).

This course is offered both as an in-class and synchronous distance learning sections. The Blackboard system will be used for most course activities. Extensive lecture notes will be available through Blackboard

*Homework:* There are weekly reading assignments and homework assignments

*Grading:* Homework sets will count for 50% of the final grade. The midterm presentation will count for 10% of the grade, the final class presentation for 15%, and the in-class final examination for 25%.

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