

IT 850 –Systems Integration Engineering (3:3:0)

Lifecycles in systems engineering and the role of systems integration and architecting in these. Large systems comprised of heterogeneous components. The human, organizational, process, and technological basis for systems integration and architecting. Societal and cultural basis for systems integration. Conceptual frameworks for systems integration and architecting. Structure, function, and purpose of the systems integration industry. Risk management and systems integration. User requirements and functional specifications in systems integration. The bid and proposal process for systems integration. Systems integration and the Federal government. System and Federation of Systems issues in systems integration. Systems integration architectures. Systems management and cost estimation in systems integration. Quality management for systems integration. Increasing returns to scale, network effects, and path dependency issues in systems integration. Evolutionary systems integration. Prerequisite SYST 301 or 510 or SYST 520.

References:

- Sage, A. P. and Rouse, W. B. (Eds.), **Handbook of Systems Engineering and Management**, John Wiley and Sons, New York, 1999.
- Sage, A. P., **Systems Management for Information Technology and Software Engineering**, John Wiley and Sons, New York, 1995.
- Sage, A. P., **Systems Engineering**, John Wiley and Sons, 1992.
- Keeping the U.S. Computer Industry Competitive: Systems Integration**, National Academy Press, 1992.
- Grady, J. O., **Systems Integration**, CRC Press, 1994.
- Mische, M. (Ed.), **Reengineering: Systems Integration Success**, CRC Press, Boca Raton FL, 1998.
- Wyzalek, J. (Ed.), **Systems Integration Success**, CRC Press, Boca Raton FL, 1999.
- Wyzalek, J. (Ed.), **Enterprise Systems Integration**, CRC Press, Boca Raton FL, 2000.

A plethora of contemporary available on the Internet concerning systems integration and related issues in architecting for systems integration 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 WebCT will be operational and put to much use.

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Course Call Number 05728, Fall 2003 Thursday from 4:30 PM to 7:10 PM in Room ST1-110 (VTC Room).

Grades: 50% - examinations; 20% - term paper and presentation; 30% - home assignments. Two take home exams will be given, one approximately at the middle of the semester and one at the end of the semester. There will be a term paper assignment on systems integration engineering, including a written report and oral presentation, and weekly assignments. Presentation: Each student will give a seven (7) minute formal oral presentation and prepare a term paper in the general area of systems architecting and integration.

It 850 - Detailed Syllabus and outline, by dates (subject to change) – Fall 2003

1. An Overview of Systems Engineering and Management, Introduction to WebCT – 28 August
2. Human, organizational, societal cultural, and technological basis for systems integration, 4 September
3. Systems Integration Standards and Capability Maturity Models, Part I – 11 September
4. Systems Integration Standards and Capability Maturity Models, Part II – 18 September.
5. The role of architecting in systems integration, Part I – 25 September
6. The role of architecting in systems integration, Part II – 2 October
7. The role of architecting in systems integration, Part III – 9 October
8. COTS and cost estimation in systems integration, 18 October, Mid Term exams due 18 October
9. Systems integration and recent DoD Acquisition Reform initiatives, 23 October
10. Integration in a System of Systems and Federation of Systems, Part I, 30 October
11. Integration in a System of Systems and Federation of Systems, Part II. 6 November
12. Path dependence, network and complex adaptive effects in system integration, Part 1 – 13 November
13. Evolutionary and emergent approaches in systems integration, Part II – 20 November
14. Thanksgiving recess, 27 November
15. Term paper presentations/reports, 4 December (class size permitting). Final exams due 11 December.

APS. 13 July 2003