

SYST 520 –System Design and Integration (3:3:0) System design and integration methods are studied, including both structured analysis and object oriented approaches: life cycle of systems, and generation and analysis of life cycle requirements; architectural representations, including development of functional, physical, and operational architectures for allocation and derivation of component-level requirements for the purpose of specification production; examination of interfaces and development of interface architectures. Software tools are introduced and used to support design, including architecture and integration efforts. Unified Modeling Language and systems engineering design.

Required Texts:

Buede, D. M., *The Engineering Design of Systems*, John Wiley and Sons, Inc. 2000.

Fowler, M., *UML Distilled: A Brief Guide to the Standard Object Modeling Language*, 2nd Edition, Addison Wesley, 2000.

References:

Booch, G., Rumbaugh, J., and Jacobson, I., *Unified Modeling Language Users Guide*, Addison Wesley, Reading MA, 1999.

Eriksson, H. E. and Penker, M., *Business Modeling with UML: Business Patterns at Work*, John Wiley, New York, 2000.

Quatrani, T., *Visual Modeling with Rational Rose 2000 and UML*, Addison Wesley, Reading MA, 2000.

Rumbaugh, J., Jacobson, I., and Booch, G., *Unified Modeling Language Reference Manual*, Addison Wesley, Reading MA, 1999.

Sage, A. P. and Rouse, W. B. (Eds.), *Handbook of Systems Engineering and Management*, John Wiley, New York, 1999.

Sage, A. P., *Systems Management for Information Technology and Software Engineering*, John Wiley, New York, 1995.

Sage, A. P., *Systems Engineering*, John Wiley, 1992.

A plethora of contemporary literature available on the Internet concerning systems design and integration and related issues in architecting 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. We will gain experience in using the CORE of software package for design and architecting. Other software will be briefly discussed: Rational Rose, System Architect, and Tofs.

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Course Call Number 34948, Spring 2003 Tuesday from 7:20 PM to 10:00 PM in Room Robinson A111.

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 design and architecting, including a written report and oral presentation, and weekly assignments.

SYST 520 - Detailed Syllabus and outline, by dates (subject to change) – Spring 2003.

1. An overview of systems engineering (Buede, Ch. 1), Introduction to WebCT – 21 January.
2. Systems engineering design process (Buede, Ch. 2) – 28 January.
3. Introduction to systems engineering software tool CORE – 4 February.
4. Modeling and process modeling (Buede, Ch. 3) – 11 February.
5. System requirements and identification of design definition (Buede, Ch. 6) – 18 February.
6. Functional architecture definition (Buede, Ch. 7) – 25 February.
7. Physical architecture definition (Buede, Ch. 8) – 4 March.
8. Operational architecture definition (Buede, Ch. 9) – 18 March. Mid term exams due 18 March.
9. Interface design and system integration and qualification (Buede, Ch. 10, 11) – 25 March.
10. Alternative structural and architectural representations (Buede Ch. 12, APS supplement) – 1 April.
11. Structural modeling and the Unified Modeling Language; UML in design and architecting (Fowler) – 8 April.
12. Structural modeling and the Unified Modeling Language; UML in design and architecting (Fowler) – 15 April.
13. Structural modeling and the Unified Modeling Language; UML in design and architecting (Fowler) – 22 April.
14. Term paper presentations and term papers due, 29 April. Final exam papers due 13 May.

APS: 13 December 2002.