



INFO 468 Syllabus

Engineering Information

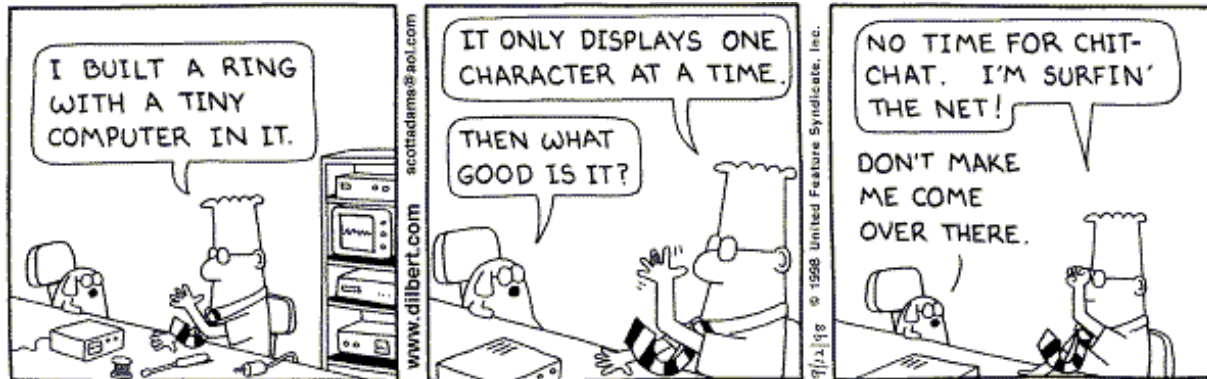
- Prerequisite** Prerequisites: INFO 461, INFO 463, and junior standing.
- Catalog** Semester course; 3 lecture hours, 3 credits. A study of information engineering as a model-based, data-centric approach to integrating organizational strategic planning with enterprise information systems development. Involves readings, group discussion, and case studies.
- Description** Information Engineering (IE) is a systems development methodology that begins with organizational strategic planning and results in implemented information systems that are more successful and easier to maintain than systems developed with traditional system development methodologies (such as OO). This course teaches the principles of IE as originally developed in the late 1980's and as the practice as it has evolved into the 20th century. This course typically involves the development of working information solutions to real-life organizational problems. These problems are addressed in-group and individual assignments. The answers to the organizational problems are often not known at the beginning of the semester.



Name	Sect.	Ref. #	Time	Day(s)	Room	Building
Information Engineering	E01	12753	7:00 - 9:40 PM	Mondays	2120	Business Building

The Institute for Data Research (IDR) is a research and development center located in Richmond, Virginia and affiliated with Virginia Commonwealth University. The Institute is an interdisciplinary research organization founded to further the study of data and metadata as valuable organizational assets. The key to IDR's successful practice of creating business value is the application of innovative data engineering and management techniques for recovering, understanding, improving and re-using organizational metadata assets.





Instructor

Peter Aiken. I received my doctorate in Information Technology from George Mason University, School of Information Technology and Engineering in 1989. The school used the following definition of information technology:

Information Technology is a discipline that encompasses the design, development, and application of hardware and software systems to facilitate human endeavors.

Contact

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not my:Yesterday is history, tomorrow is a mystery and
quote:today is a gift - that's why it's called the Present.
logistics:Please note that on this message is likely to be coming
to you from somewhere other than Richmond, VA as I
work on sponsored research for VCU and the Institute.
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Fax Note

If you fax me any material please call and leave me a message so I can be certain to separate your fax from the others in the in-box.

Voice Mail

My office phone rolls over to voice mail after three rings - you can always leave a message there for me. I check my messages regularly, especially when I'm traveling, and I will return your call.

Home Office

I spend about 50% of my research time working at my home office, please feel free to try to contact me there. At home I often hide from sales calls behind the answering machine. If you get the answering machine, press and hold any key on your touch-tone phone to by-pass the recorded message and please announce yourself. If I'm there, I'll pick up unless I'm attempting deep



concentration. Regardless, please leave me a message - I will return your call.

Office Hours My office hours are before class my classes from 4:00-7:00 PM and other times by appointment. In addition to my regularly scheduled office hours, I'll stick around as long as required after the evening class to answer any questions.

Schedule My class schedule for the Spring 2002 semester is INFO 468 on Mondays and INFO 632 on Tuesdays. Both classes are from 7-9:40 PM.

Texts Finkelstein, C. and P.H. Aiken, *Building Corporate Portals Using XML*. 1999, New York: McGraw-Hill. 394 pages (ISBN 0-07-913705-9).

Attendance You are responsible for all material discussed in class.

Grading Grades will be determined by a combination of your class participation, your semester project results, and your grade(s) on one or more tests. The test grade(s) will be averaged with the project grade and the participation grade can positively influence that average.

Required Fine Print (Spring)

Religion Friday, January 25th is the deadline for students to provide advance written notification to instructors of intent to observe religious holidays

Graduation Friday, January 25th is the last day for Fall degree candidates - to submit graduation applications to you advisers for December degrees.

Withdrawal Friday, March 8th is the last day to withdraw from a course with a mark of "W".

Disabilities Students with special requirements must inform the instructor of these within the first two weeks of the semester. The University Office of Academic Support must also certify these requirements in order to receive special considerations.

Weather If classes are canceled due to inclement weather, any scheduled tests or assignment due dates will be automatically moved to the next regular class meeting.

Ethics Students must abide with the University computing ethics policy.

Holidays "It is the policy of VCU to accord students, on an individual basis, the opportunity to observe their traditional religious holidays. Students desiring to observe a religious holiday of special importance must provide advance written notification to each instructor by the end of the second week of classes. Instructors are



encouraged to avoid scheduling one-time only activities, which cannot be replicated, on these dates. Faculty members are expected to make reasonable accommodations to students who are absent because of religious observance through such strategies as providing alternative assignments or examinations or granting permission for audio or video recordings and the like."

Honor Code

All submitted work is considered "pledged" according to the VCU Honor System. Cheating and plagiarism are unacceptable and will be handled in accordance with the Academic Integrity Policy as specified in the *VCU Resource Guide*. Except in those cases where teamwork has been expressly permitted all work must be done individually by each student.

Tentative Schedule

Week	Date	Text	Chapters	Class Focus
1	1/14			Course Overview
2	1/21			No Class Lee, Jackson, King Day
3	1/28	BCPUX	1	Enterprise Portal Concepts
4	1/30	BCPUX	2	Strategic Business Planning: Designing Tomorrow, Today
5	2/4	BCPUX	3	Data Modeling: A Window into the Enterprise
6	2/11			No Class
7	2/19	BCPUX	4	Strategic Modeling: A Map for the Future
8	2/26	BCPUX	5 6	Engineering Enterprise Portals: Implementing Decision Early Warning Metadata Analysis Dimensions
9	3/4			No Class
10	3/11			Spring Break
11	3/18	BCPUX	7	Metadata Engineering Activities
12	3/25	BCPUX	8 9	Metadata Types Metadata Quality
13	4/1	BCPUX	10	Metadata Project Example
14	4/8	BCPUX	11	The Internet and XML: The Future of Metadata
15	4/15	BCPUX	12 13	Using XML as a Business Reengineering Technology Enterprise Portals and Reengineering Technologies
16	4/22	BCPUX	14 15	Implementing Organizational Quality Initiatives The Central Role of Enterprise Portals
17	4/29			No Class



Some Definitions:

Engineering "1. The application of scientific and mathematical principles to practical ends such as the design, construction, and operation of efficient and economical structures, equipment, and systems.

2. The profession of or the work performed by an engineer."

American Heritage Dictionary , Second College Edition, Boston: Houghton Mifflin Company, 1982

Software Engineering "the application of science and mathematics by which the capabilities of computer equipment are made useful to man via computer programs, procedures, and associated documentation."

"Six primary goals timeliness, efficiency, reliability, simplicity, cost-effectiveness, modifiability"

Barry Boehm

System Composed of people, processes, software ,hardware, and data.

Systems Engineering "Systems engineering is an appropriate combination of mathematical, behavioral, and management theories in a useful setting appropriate for the resolution of complex real-world issues of large scale and scope. As such, systems engineering consists of the use of mathematical, behavioral, and management constructs to identify, structure, analyze, evaluate, and interpret generally incomplete information. When associated with a value system, this information leads to knowledge to permit decisions that have been evolved with maximum possible understanding of their impacts. A central problem of systems engineering is to select methods that are explicit, rational, and compatible with the policy implementation framework extant such that decision making and the resulting policies become as efficient, effective, equitable, explicable as possible."



A. P. Sage, "What is Systems Engineering," 1985.

Information Engineering Information Engineering is a data centered approach to integrating strategic corporate planning with information systems development.

organizational data is inherently more stable than organizational processes

data is an organizational asset and should be treated similar to organizational real estate, inventory, financial and human resource assets.

Information Systems "1. A system or data and processes that can be used to record and maintain information. Contrasted with production system, to mean a system in which the data stored will be used in ways that are not fully predictable in advance.

(KB) 2. A logical partition of data and processes that can be analyzed independently to collect, store, and retrieve information to satisfy a portion of an business segment's information needs. Business area is often used interchangeably with the scope of an information system."

James Martin, *Information Engineering Book II Planning and Analysis*, Prentice-Hall Englewood Cliffs, NJ, 1990.

Analysis "The process of brainstorming and/or interviewing to help understand a problem in the problem domain or the scope of the product space; also called software requirements analysis, systems analysis, problem analysis."

Alan Davis, *Software Requirements: Analysis and Specification*, " Prentice Hall, 1990.

Product Space "The subset of the universe of products where any member would satisfy the requirements."



Alan Davis, *Software Requirements: Analysis and Specification*, " Prentice Hall, 1990.

Design "The architecture of the software and the algorithms used therein. The stage of the software life cycle where the architecture and algorithms are selected; immediately follows the requirements stage."

Alan Davis, *Software Requirements: Analysis and Specification*, " Prentice Hall, 1990.

Mission "is the highest-level statement of objectives. It gives broad description of the purpose and policy of the enterprise."

James Martin, *Information Engineering Book I Introduction*, Prentice-Hall Englewood Cliffs, NJ, 1989.

Strategy "A strategy in an enterprise is a pattern of goals, policies, and plans that specify how an organization should function over a given period. A strategy may define areas for product development, techniques for responding to competition, means of financing, size of the organization, image the enterprise will project, and so on."

James Martin, *Information Engineering Book I Introduction*, Prentice-Hall Englewood Cliffs, NJ, 1989.

Objectives "general statements about the directions in which a firm intends to go, without stating specific targets to be reached at particular points in time"

Christine V. Bullen and John F. Rockart "A Primer on Critical Success Factors" in *The Rise of Managerial Computing* (Rockart and Bullen, editors) Homewood, Illinois: Dow Jones-Irwin, 1986, pp. 383-422.

Goals "specific targets that are intended to be reached at a given point in time. A goal is thus an operational transformation of one or more objectives"

Christine V. Bullen and John F. Rockart "A Primer on



Critical Success Factors" in *The Rise of Managerial Computing* (Rockart and Bullen, editors) Homewood, Illinois: Dow Jones-Irwin, 1986, pp. 383-422.

Data Models "A logical map of data which represents the inherent properties of the data independently for software, hardware, or machine performance considerations. the model shows data items grouped into third-normal-form records, and shows the associations among those records. The term model may be contrasted with the term schema. A schema also shows a logical representation of data, but it is usually related to a type of software representation, (e.g., CODASYL, hierarchical, or relational). Martin recommends the term model be reserved for data representations that are independent of which class of software is used for implementation. The software choice may change, but the model remains a fundamental description of the system."

James Martin, *Information Engineering Book II Planning and Analysis*, Prentice-Hall Englewood Cliffs, NJ, 1990.

Structured Techniques "1) Allows the form of the problem to guide the form of the solution 2) Provides a means of decomposing the problem 3) Features a variety of tools simplifying system understanding 4) Offers a set of strategies for evolving a design solution 5) Offers criteria for evaluating the quality of a design solution 6) Framework - institutional knowledge

Alan L. Eliason, *Systems Development Analysis, Design, and Implementation*, Scott, Foresman and Company, Glenview, Illinois, 1990.

Institutional Knowledge "The means by which an organization becomes more competent in a particular area, in spite or as a part of normal attrition."

Aiken.