

Department of Information Systems & Quantitative Analysis
College of Information Science & Technology
University of Nebraska at Omaha

ISQA 8220, Advanced Systems Analysis & Design, Spring 2006
COURSE SYLLABUS

LOGISTICS

Time: 5:30-8:10 p.m., Mondays, PKI 261, call # 11580

Instructor: Professor Ilze Zigurs, PKI 284E, voice: 402.554.3182, fax: 402.554.3400,
izigurs@mail.unomaha.edu, <http://www.isqa.unomaha.edu/izigurs/home.htm>

Office hours: From 1:00 to 4:00 p.m. Mondays, and by appointment, email, and/or telephone

Required text and readings: Stephen R. Schach (2004), *An Introduction to Object-Oriented Systems Analysis and Design with UML and the Unified Process*, McGraw-Hill.

Additional readings are required, as posted in Blackboard and/or handed out in class.

Prerequisite: ISQA 8040, An Overview of Systems Development, or equivalent

Blackboard: Course documents, up-to-date schedule information, and student grades are available through Blackboard, so check early and often for the latest information.

COURSE OVERVIEW

Information technology is ubiquitous. The challenge we face is to build effective systems that are both reliable and flexible, and to do so in a timely way. This course addresses that need through in-depth study of best practices in system development. The course focuses on advanced systems analysis and design methods, techniques, and tools. We combine theory with practice for the overall purpose of understanding and improving systems development. The course covers current and future-oriented practices in software engineering, rooted in the lasting and fundamental best practices of our field. We address the inherent tension between standards and rapid adaptability through use of such methods as iterative development, incremental development, and the idea of growing systems. We compare, contrast, and practice a variety of perspectives embodied in different system development methods.

You, the student, are expected to bring knowledge from other courses and your own experience into this course. The topics in this course build on and relate to topics in other courses. You are expected to apply your knowledge, to practice with different tools and techniques, to examine a variety of points of view, to critique the reading and each others' views, to stretch your thinking, and ultimately to learn. Hopefully, you will finish the course with a clear recognition that there is no "one right way" to engineer and implement an information system, but some ways are better than others. It is your job to understand the "who, what, when, where, why, and how" of those better ways. *That* is the fundamental challenge underlying effective systems analysis and design.

The course covers a variety of advanced systems analysis and design methods, techniques, and tools, including object-oriented, soft systems, and socio-technical methods. The key focus in the course, however, is on object-oriented methods and techniques. You will apply the methods and techniques presented in the course to the analysis and design of a real-world project. The scope of the project is managed through on-going consultation with the instructor.

LEARNING OBJECTIVES

By the end of the semester, you should be able to:

- Describe the meaning and relationships among concepts of the course, including systems, systems engineering, life cycle, systems development method, systems development technique, and systems development tool
- Compare and contrast current systems development methods, e.g., structured methods, socio-technical methods, soft systems methods, agile methods, and object methods
- Choose and justify appropriate systems development methods for different types of systems projects
- Apply appropriate systems development techniques and tools in different phases of a systems development project
- Describe and apply the concepts, techniques, and tools of an object-oriented systems development method
- Create use-case descriptions and diagrams
- Use Class-Responsibility-Collaboration cards to document object classes
- Create a class diagram and explain its role in object systems development
- Create interaction diagrams and explain their role in object systems development
- Explain and apply the basic design concepts of abstraction, modularity, information hiding, complexity, and systems structure
- Be aware of leading-edge trends and their implications for systems development

GRADING

Your final grade in the course will be determined as follows:

Midterm Exam	25 %
Final Exam	25 %
Team Project Report	30 %
In-Class Presentations	10 %
Class Participation/Quizzes/Homework	<u>10 %</u>
Total	100 %

Exams

The midterm and final exams will cover assigned readings, lectures, projects, and in-class discussions and exercises. The midterm exam will be an in-class, closed-book, closed-notes exam that emphasizes techniques and basic knowledge. It will include a variety of question formats, e.g., multiple choice, problem solving, case analysis, short answer, and/or essay. The final exam will be a take-home exam that includes both material from the second half of the course and some cumulative questions. The focus in the final exam will be on integration of material and extension and application of your thinking and judgment capabilities in the context of the course. The exam may include case analysis, model development, and/or essay questions.

Team Project

You will apply the methods, techniques, and tools learned during the semester to a real world systems analysis and design project. The project has three deliverables: a project proposal (not graded), a final written report, and in-class presentations. The instructor will assign the topic and date of the in-class presentations once teams are formed. The first presentations illustrate the

application of systems development techniques to your team project via a walkthrough of a system development deliverable. The final presentations give you the opportunity to show what you accomplished in your project. Details on the team project will be handed out separately.

Class Participation/Quizzes/Homework

You are expected to contribute regularly to class, both voluntarily and when I call on you. Everything we know about learning says that engagement is essential. Engagement is evident in participation—in exposing your opinions to the rest of the class and developing your knowledge through articulation. Class meetings will be working sessions, devoted to discussion and practice of the concepts and techniques of systems development, using the tools we have at our disposal. Instead of passive absorption of wisdom handed down by the instructor, prepare for active involvement in the topic to be mastered at each class meeting. Expect to learn from your peers and provide learning to them, as well as from and to the instructor. I expect you to come prepared to class, and I will call on you to provide an informed opinion. I encourage you to ask questions about and discuss the material, either in class or in my office. Material that supplements the readings will be developed in class, so attendance is essential to full mastery of the course. Homework may include various exercises, virtual or otherwise, related to systems analysis and design. Most classes will start with a brief quiz that covers basic concepts in the readings assigned for that day. You cannot make up a quiz (even for an excused absence such as illness), but you can drop your lowest grade in one of the quizzes during the semester.

Final Grades

Your final grade is based on the percentage of points that you receive out of the total possible points for the course. The grade scale is shown in the following table. A curve may be used to scale the entire class higher, if necessary, but scaling down will not be done.

GRADE	POINT VALUE
A+	$97\% \leq x \leq 100\%$
A	$92\% \leq x < 97\%$
A-	$90\% \leq x < 92\%$
B+	$87\% \leq x < 90\%$
B	$82\% \leq x < 87\%$
B-	$80\% \leq x < 82\%$
C+	$77\% \leq x < 80\%$
C	$72\% \leq x < 77\%$
C-	$70\% \leq x < 72\%$
D+	$67\% \leq x < 70\%$
D	$62\% \leq x < 67\%$
D-	$60\% \leq x < 62\%$
F	Less than 60%

COURSE POLICIES

This course will be conducted in a manner consistent with official policies of the University of Nebraska at Omaha and in a spirit of professionalism and integrity. Please read and follow the Student Code of Conduct at <http://studentaffairs.unomaha.edu/studentcode.php>. In addition, the following points deserve special emphasis.

Academic Integrity

The web has made it all too easy to copy material from all over the world and include it in your own reports and writing. Be aware that you must cite your web sources just as you would sources from printed material. To copy another's ideas or writing and pass them off as your own is *plagiarism*. It is unethical and illegal. Dishonest students suffer the risk of failing this course and being expelled from the university. Remember, if you copy material verbatim *from any source*, including web sources, you must put quotation marks around the verbatim material and provide a citation to its source. Merely changing a word or two, so that the material is no longer verbatim, still is not enough to make those ideas your own. ***YOU MUST ALWAYS CITE THE SOURCE.***

Cheating or copying will not be tolerated. You are expected to do your own work on the assignments. If you turn in another person's work as your own, you will receive an F for the course. Please review the information on the plagiarism policy implemented in this course on Blackboard. You must print and sign the policy and hand it in no later than the second class.

Late Assignments, Make-ups, and Incompletes

You are expected to turn in all assignments on time. Late assignments suffer a penalty of one letter grade per day. There are no make-ups for assignments or quizzes. Make-ups for exams are given only in extreme or unexpected circumstances such as a car accident. Incomplete grades will not be given unless there are extraordinary circumstances, as determined by the instructor.

Score/Grade Appeals

Any grade you receive on an assignment or exam is subject to appeal. You must make the appeal in writing. However, score changes are at the discretion of the instructor and may be up or down based upon a complete review of the work. Final letter grades are assigned by the instructor, based on total score distribution at semester's end. A grade reflects *another's* judgment of your work. In this sense, all grading is subjective. Appealing scores on assignments is discouraged, since a few points rarely make a difference in the final grade. Time is much better spent discussing/clarifying the information content presented in the course. Ask for work to be re-graded only in cases of real inequity.

Disabilities

Accommodations are provided for students with verified disabilities. For more information, contact Services for Students with Disabilities (SSD) in EAB 117 or 554-2872, TTY 554-3799, <http://avalon.unomaha.edu/disability/>.

ROLE OF THE INSTRUCTOR

The instructor is your teacher, supervisor, guide, motivator, and colleague in learning. She must provide enough structure to this experience so that you actually accomplish your objectives, while simultaneously supporting flexibility and creativity. The instructor knows a lot of stuff. She has actually developed systems in a prior life and stays in contact with people who continue to do so. However, she does not know everything and is not afraid to say so. If we view our model for this course as an apprenticeship, then everyone learns from everyone else. Each of us knows something that another person does not know, and the best thing about knowledge is that you can give it away while still retaining it yourself. One of the instructor's most important tasks is to make sure we all share our knowledge effectively. Another task is to get everyone involved—to communicate a sense of excitement about the tremendous importance of effective systems development processes in the organizations of the 21st century.

YOUR ROLE

All these other components come down to one thing and that is you. If you do not invest *yourself* in what we are doing, then we all lose. You must be present not only physically, but mentally and emotionally. The meaning of being present physically is obvious. Being present mentally means being prepared for every class meeting. Being present emotionally means caring about what you do—and showing it in your work. One of the most common complaints from recruiters is that they simply cannot find enough people of quality. People of quality are people who care about what they do—who do their best work with the best tools available and put a piece of themselves into everything they do. So there is our challenge—to work together, learn something, and have fun doing it! Evening classes present special challenges for staying alert and staying connected. We are fortunate to have technology these days that helps with the latter, so let's put it to good use.

WHO IS ILZE?

Dr. Ilze Zigurs joined UNO in Fall 2001, having taught at the University of Colorado for thirteen years and the University of Minnesota for one year prior to that. She used to build systems for a living, starting out as a COBOL programmer in a prior century. Ilze analyzed and designed a variety of systems in those days, and saw all kinds of problems with the way systems were being developed. Partly to figure out why things were happening the way they were, she went back to school to learn something about theory and principles and how they could be applied to improve practice. She has been working on that goal ever since.

Ilze's research focuses on collaboration technologies, more popularly known as groupware. She is especially intrigued by virtual organizations, virtual teams, and virtual project management. Ilze is working on several projects to figure out how information and communication technologies might best support global, virtual collaboration. These ideas are especially relevant for development teams, given the increasingly common phenomenon of global software development.

COURSE SCHEDULE, as of 1/9/2006

The schedule is subject to change. You are responsible for announcements of changes via the official course site in Blackboard.

Class	Date	Topic	Assignments
1	9 Jan	Course introduction, overview, logistics, and key concepts	Read syllabus
			Student information sheet due
-	16 Jan	No class – M.L. King, Jr. Birthday	
2	23 Jan	IS development strategies; OO paradigm; UML; Unified Process	Read Chapters 1, 2, 3
			Read handout 1
			Picture card due
			Team information due
			Signed plagiarism statement due
3	30 Jan	Requirements workflow; Inspection format	Read Chapters 4, 5, and Section 13.3 on pp. 248-251.
			Team project proposal due
4	6 Feb	Project team inspections – all teams	Team inspection handout due
5	13 Feb	Object-oriented analysis workflow	Read Chapters 6, 7
6	20 Feb	Object-oriented design workflow; Workflows and phases	Read Chapters 8, 9
7	27 Feb	Experiences with application development, maintenance, and systems integration (speaker to be announced)	Read handout 7
8	6 Mar	Mid term exam	
-	13 Mar	No class - Spring break	Chilling out due
9	20 Mar	Socio-technical design; Soft Systems Methodology (potential guest speaker)	Read handout 2
10	27 Mar	IS development methodologies	Read handouts 3 & 4
11	3 Apr	Collaborative requirements engineering (potential guest speaker)	Read Chapter 12
			Read handouts 5 & 6
			Methodology comparison due
12	10 Apr	Leading-edge trends	Read Chapters 11, 13
			Skim Chapters 17, 18, 19, 20
			Read handout 8
13	17 Apr	IT project management in action: Simulation exercise	Read Chapters 14, 15
14	24 Apr	Final project presentations; Course evaluation	Team project report due
Final	1 May	Final exam	Final exam paper due at 5:30 p.m. No exceptions. Don't even ask.

Readings:

1	Selected excerpts, The Ugly American, by Lederer & Burdick
2	Soft Systems Methodology: A Thirty Year Retrospective, by Checkland
3	Analyzing the Structure of IS Methodologies, by Seligmann et al.
4	A Dynamic Framework for Classifying Information Systems Development Methodologies and Approaches, by livari et al.
5	Developing Groupware for Requirements Negotiation: Lessons Learned, by Barry Boehm et al.
6	Enabling the Effective Involvement of Multiple Users, by Douglas Dean et al.
7	Executive Information Requirements: Getting It Right, by James Wetherbe
8	Patterns and Software: Essential Concepts and Terminology, by Brad Appleton, http://www.cmcrossroads.com/bradapp/docs/patterns-intro.html