

INFM 718V Organizational and Business Process Modeling

Fall 2010 - Tentative Syllabus

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Office Hours:	By appointment

Class meeting time and place:

Wednesday afternoons 1:00 PM to 3:45 PM in Hornbake 2119 (Wireless Lab).

Catalog Description:

General principles of modeling. Methods for modeling organizational and business process for information applications development. Approaches to evaluating models based on their accuracy and usefulness.

Extended Description:

Contemporary organizational and managerial structures involve many layers of intricate complexities. Those complexities pose unique challenges when an intervention is needed for improving the effectiveness and efficiency of a given organizational or managerial structure, including but not limited to information applications development projects. One way to deal with those complexities is to frame the structure at hand as a system, and develop a model, or a number of models, which would eliminate the unnecessary details, and retain only the relevant aspects of the system.

Organizational and Business Process Modeling will introduce a number of contemporary methods for framing and modeling organizational and business processes for a variety of purposes, including information applications development. Among those methods are UML, data and logic requirements modeling, and system dynamics simulation modeling.

The Fall 2010 offering of INFM 718V will have an emphasis on modeling of non-linear feedback dynamics in business and organizational settings with a focus on sustainability issues in information management and information technology. Growing complexities in organizations has brought about systemic problems that are impossible to fully understand and address using traditional linear approaches. System thinking and system dynamics approaches provide tools that can be used for modeling complex non-linear feedback systems. The models can then be simulated in order to identify root causes of the systemic problems, and develop solution strategies for addressing those problems.

Goals:

After completing this course the student will:

- be familiar with Unified Modeling Language (UML), and its various diagram types,
- be able use UML for modeling basic organizational and business processes,

- be able to identify feedback dynamics in phenomena encountered in organizational and business settings,
- develop cause-and-effect diagrams of problems for identifying major feedback loops, and simple models that can be simulated for analysis of organizational and managerial processes and problems.
- analyze a systemic problem that may impair the sustainable operation of an organization, and develop strategies to solve the problem by making use of modeling and simulation.

Elements of the Course:

Active Participation: The course will involve in-class (and possibly online) discussions, as well as in-class exercises. The students are expected to come to class prepared, and participate actively. Please inform the instructor in advance if you will not be able to participate in a class meeting.

Assignments: Student will be given take-home assignments over the semester. Students are expected to work *individually* on the assignments. Timely submission of the completed assignments is essential. Students should refer to the course space on BlackBoard for the due date of each assignment. If an assignment due date is a religious holiday for you, please let the instructor know at least one week in advance, so an alternate due date can be set for you.

Team Project: The students will form two-person teams to work on building a simulation model for analyzing a systemic problem, and developing strategies to solve that problem. Each project will focus on a dynamic feedback problem that will be identified by the team, and approved by the instructor. Although a wide variety of problems (including business-related, macro-economic, socio-economic, urban growth-related, environmental, ecological issues) are potentially acceptable as project topics, the teams are particularly encouraged to focus on sustainability-related problems, since there is a growing need for individuals who possess the knowledge and skills to address a variety of sustainability issues on either a micro or a macro level, or potentially on both levels. There will be three interim submissions, and a final submission for the project. The final submission will include a model and a report documenting the modeling process and the findings of the study. The reports will be of publishable quality, and the teams will be expected to submit their reports to student project competition both on and off campus. Two such venues are UMD's Graduate Research Interaction Day (GRID) competition, and the student paper competition of the International System Dynamics Conference, which will be held at Washington, D.C. in Summer 2011. (As a point of encouragement, one of the team projects from the Fall 2008 section of this course won a GRID award.) Details about the project and submission deadlines will be given on the course website on BlackBoard.

Grading:

Assignments (On Time)	50%
Team Project (On Time)	50%
Active Participation and Attendance	Although this component will not be added as extra points to your grade, excessive absence (missing more than three sessions with documented explanation, or more than one session without explanation,) non-participation,

disruptive behavior in class, or other unwanted behavior may affect your grade negatively. Consider this component as a "hygiene factor."

Required Software:

Vensim PLE: This software is freely available at <http://vensim.com/freedownload.html>. We will use Vensim PLE later in the course (about last one-half to one-third of the semester) for developing feedback diagrams and simulation models. However, you may wish to download and install the software early on to avoid last minute hassles.

Other Software:

Your choice of a software tool to draw UML diagrams. Many free or commercial tools are available; please see http://en.wikipedia.org/wiki/List_of_UML_tools. Students used StarUML and ArgoUML in the past. These are both freely available tools, but they have certain limitations, some of which may be critical (such as not supporting a specific UML diagram type.) Fell free to research for other tools and use them, including commercial tools, if you have access to those. You may also choose to use Visio if you have it on your computer, or use some other program with diagramming capabilities, including MS PowerPoint, or even MS Word. I am not able to provide detailed support specific for these and other tools, so choose a tool that you will be comfortable with. Note that this course is not aimed at teaching you a specific UML diagramming tool, but rather the core principles of UML as a modeling approach.

Please also note that you will need to import or paste your diagrams in a file whose format I can read on my computer, such as .doc or .ppt, since I do not have the means to open each and every file format on my computer. (UML tools generally come with their own specific file formats.) Consequently, before you settle on a UML tool, make sure that you can import or paste the diagrams from that tool into MS Word or MS PowerPoint.

Required Texts:

1) Learning UML 2.0 (Russ Miles and Kim Hamilton)

O'Reilly Media, Inc. - ISBN: 0596009828

(An electronic version of this book is available. You may be able to purchase it online as an e-book. The electronic version is also available on O'Reilly's Safari site through the university libraries website at lib.umd.edu. Please note that there is a limit on the number of readers accessing the electronic version through the university libraries, and that number may be as low as 1.)

AND

2) Business Dynamics: Systems Thinking and Modeling for a Complex World with CD-ROM

(John D. Sterman) - McGraw-Hill/Irwin; 1st edition - ISBN: 007238915X

Online Readings:

1) A History of the Kaibab Deer (Chris Young)

Part 1: <http://depts.alverno.edu/nsmt/youngcc/research/kaibab/story1.html>

Part 2: <http://depts.alverno.edu/nsmt/youngcc/research/kaibab/story2.html>

Part 3: <http://depts.alverno.edu/nsmt/youngcc/research/kaibab/story3.html>

2) The Global Citizen (Dana Meadows)

<http://www.pcdf.org/meadows/>

(Selected readings from this website will be assigned during the semester. The readings will be discussed in class.)

Other Relevant Texts:

The Fifth Discipline Fieldbook (Peter M. Senge et al.)

Doubleday / Broadway Business - ISBN: 0385472560

The Fifth Discipline (Peter M. Senge)

Doubleday Business - ISBN: 0385260954

Other relevant UML, database modeling, and systems analysis and development books.

These books are not available through the university book store. Please consider ordering through your local bookstore or an online store.

Relatively cheap copies of all of the books listed above are available via online stores such as abebooks.com, amazon.com, betterworldbooks.com, bn.com, borders.com, half.com, textbooksrus.com.

(The instructor does not endorse these or other websites, or bookstores. Please note that some copies sold online are used. Used copies are usually sold by third-parties, not by the online stores themselves. Please order at your own risk.)

Keep in mind that orders through local stores, as well as online stores, may take a few weeks to arrive. Please order your books as soon as possible.

Policy on Academic Misconduct

Cases of academic misconduct will be referred to the Office of Student Conduct irrespective of scope and circumstances, as required by university rules and regulations. It is crucial to understand that the instructors do not have a choice of following other courses of actions in handling these cases. There are severe consequences of academic misconduct, some of which are permanent and reflected on the student's transcript. For details about procedures governing such referrals and possible consequences for the student please visit

<http://www.studentconduct.umd.edu/>

University of Maryland Code of Academic Integrity:

"The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information

on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.studenthonorcouncil.umd.edu/whatis.html>."

Special needs

Students with disabilities should inform the instructor of their needs at the beginning of the semester. Please also contact the Disability Support Services (301-314-7682 or www.counseling.umd.edu/DSS/). DSS will make arrangements with the student and the instructor to determine and implement appropriate academic accommodations. Students encountering psychological problems that hamper their course work are referred to the Counseling Center (301-314-7651 or www.counseling.umd.edu/) for expert help.

Tentative Course Plan (Subject to possible change during semester):

	Date	Topics	Textbook Readings
1	Sept. 01	Introduction to modeling Classes and objects; Introduction to UML	[UML] pp. 1-19; External readings
2	Sept. 08	Use-case models	[UML] pp. 20-42
3	Sept. 15	Activity diagrams	[UML] pp. 43-62
4	Sept. 22	Class diagrams; Object diagrams	[UML] pp. 63-100; pp. 101-107
5	Sept. 29	Sequence diagrams; Communication diagrams Entity-Relationship models	[UML] pp. 108-130; pp. 131-144
6	Oct. 06	Complex Systems; Systems Thinking; System Dynamics	[BD] pp. 3-39; pp. 41-81
7	Oct. 13	System Dynamics Modeling Process; System Structure and System Behavior	[BD] pp. 83-105; pp. 107-133
8	Oct. 20	Causal Loop Diagrams CLD Exercise: Kaibab Plateau Model	[BD] pp. 137-190
9	Oct. 27	Stocks and Flows; Stock-Flow Diagrams; Using Vensim SFD Exercise: Kaibab Plateau Model	[BD] pp. 191-230; pp. 231-262
10	Nov. 03	Dynamics of Simple Structures; Negative Feedback; S-Shaped Growth	[BD] pp. 263-291; pp. 295-347
11	Nov. 10	Positive Feedback; Delays	[BD] pp. 349-406; pp. 409-467
12	Nov. 17	Validation and Model Testing Policy Analysis: Kaibab Plateau Model	[BD] pp. 845-891
13	Nov. 24	In-class work on Team Project	TBA
14	Dec. 01	In-class work on Team Project	TBA
15	Dec. 08	In-class work on Team Project	TBA

Additional readings may be assigned as necessary through the semester.