INFM 757 - Organizational and Business Process Modeling
Fall 2015 - Tentative Syllabus

| Instructor: | Vedat G. Diker |
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| Office Hours: | By appointment |

| Class meeting time and place: |
| Thursday evenings (9/3/2015 - 12/10/2015) |
| 6:00 PM to 8:45 PM |
| in SG-III, Room 4212 (Shady Grove campus) |

**Catalog Description:**
General principles of modeling. Methods for modeling organizational and business processes for information applications development. Approaches to evaluating models based on their accuracy and usefulness.

**Extended Description:**
Contemporary organizational and business structures involve layers of complexities, including those that manifest themselves in the processes, the data structures, and the administrative subsystems within the given organization. These complexities pose unique challenges to the organization, when an intervention is needed for improving the effectiveness and efficiency of the organizational structure, including but not limited to information applications development projects. One way to deal with these complexities is to frame the structure at hand as a system, and develop a model, which would eliminate the unnecessary details, and reflect only the relevant aspects of the system, so that only the critical details of the problem are left in focus. 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 better information applications development, and improved process and data management in an organization. Among those methods are UML, data and logic requirements modeling, and feedback system dynamics simulation modeling.

**Goals:**
After completing this course the student will be able to:
- use Unified Modeling Language (UML) with its various diagram types,
- use UML for modeling basic organizational and business processes and data structures,
- identify feedback dynamics in phenomena encountered in organizational and business settings,
- develop cause-and-effect diagrams of problems for identifying major feedback loops,
- develop 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 discussions and modeling work, 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 Canvas 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.

UML Project: Teams of students will work on building a UML model of a reasonable size information system (either in-existence or planned). Each project will involve a number or different UML diagrams to articulate the specifications of the information system in question. There will be interim submissions, and a final submission for the project. The final submission will include a UML model and a report presenting the information system in question and documenting the modeling process. The models and reports will be of professional quality, in the sense that they could be used as the basis for actual system development in real world. Details about the expectations for the UML project and submission deadlines will be given on the course website on Canvas. The UML project will be due about midway in the semester.

System Dynamics Project: Teams of students will 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 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 in Delft, the Netherlands between July 17 and July 21, 2016. Details about the expectations for the project and submission deadlines will be given on the course website on Canvas. The project will be due by the last few weeks of the semester.

Grading:
Assignments (On Time) 30%
UML Project (On Time) 35%
System Dynamics Project (On Time) 35%
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.

Recommended 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, which you may be able to access 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 might be a simultaneous-use limit on the electronic version when accessed through the university libraries. You can access the book by following this link (you will need to login with your UMD Directory ID and password):
http://proquest.safaribooksonline.com.proxy-um.researchport.umd.edu/0596009828

AND

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

These books are not available through the university book store.

Online Readings:
1) A History of the Kaibab Deer (Chris Young)
   Part 2: http://depts.alverno.edu/nsmt/youngcc/research/kaibab/story2.html

2) The Global Citizen (Dana Meadows)
   http://www.donellameadows.org/article-category/global-citizen-columns/
   (Selected readings from this website may be assigned during the semester. Also, consider using some of the ideas in the readings as bases for your team project.)

Other Relevant Texts:
The Fifth Discipline Fieldbook (Peter M. Senge et al.)

The Fifth Discipline (Peter M. Senge)

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

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 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, ArgoUML, and Modelio in the past, as well as the online modeling platform LucidChart (https://www.lucidchart.com/). These are freely available tools, but each may have certain limitations, some of which may be critical (such as not supporting a specific UML diagram type.) Feel 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, or use some other application with diagramming capabilities, including MS PowerPoint, or even MS Word. I am not able to provide
detailed support that is specific for any given tool, so choose a tool with which you are, (or with practice will be,) comfortable. 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.
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.**

Different instructor may define academic misconduct differently. For this section of this course, academic misconduct includes, but is not necessarily limited to,
- copying or presenting another person’s work as a whole or in part, such as diagrams, figures, charts, graphs, text, equations;
- making one’s work available to another person as a whole or in part including elements mentioned above;
- doing another person’s course-related work that includes developing elements mentioned above.
If you are not sure whether a particular action constitutes academic misconduct, consult with the instructor **before** committing that action.

For details about procedures governing such referrals and possible consequences for the student please visit [http://osc.umd.edu/OSC/Default.aspx](http://osc.umd.edu/OSC/Default.aspx)

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://shc.umd.edu/SHC/Default.aspx](http://shc.umd.edu/SHC/Default.aspx)."

Special Needs
The University is legally obligated to provide appropriate accommodations for students with disabilities. The campus’ Disability Support Services Office (DSS, [http://www.counseling.umd.edu/DSS/](http://www.counseling.umd.edu/DSS/)) works with students and faculty to address a variety of issues ranging from test anxiety to physical and psychological disabilities. If a student or instructor believes that the student may have a disability, they should consult with DSS (301-314-7682 or Dissup@umd.edu). Note that to receive accommodations, students must first have their disabilities documented by DSS. The office then prepares an Accommodation Letter for course instructors regarding needed accommodations. Students are responsible for presenting this letter to their instructors. Students encountering psychological problems that hamper their course work are referred to the Counseling Center (301-314-7651 or [http://www.counseling.umd.edu/](http://www.counseling.umd.edu/)) for expert help.
### Tentative Course Plan (Subject to possible change during semester):

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<thead>
<tr>
<th>Date</th>
<th>Topics</th>
<th>Readings</th>
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<tbody>
<tr>
<td>1</td>
<td>Sept. 3 Introduction; Course logistics; Basic concepts</td>
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<tr>
<td>2</td>
<td>Sept. 10 Introduction to modeling; Classes and objects; Introduction to UML</td>
<td>External readings <em>(see ELMS)</em> [UML] pp. 1-42</td>
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<td>3</td>
<td>Sept. 17 Use-case models; Activity diagrams</td>
<td>[UML] pp. 43-62</td>
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<td>5</td>
<td>Oct. 1 Class diagrams; Object diagrams</td>
<td>[UML] pp. 108-130</td>
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<td>6</td>
<td>Oct. 8 Sequence diagrams; Collaboration diagrams</td>
<td>[UML] pp. 131-144</td>
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<td>7</td>
<td>Oct. 15 Complex Systems; Systems Thinking; System Dynamics</td>
<td>[BD] pp. 3-39; pp. 41-81</td>
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<tr>
<td>13</td>
<td>Nov. 26 Thanksgiving - No Class</td>
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<tr>
<td>14</td>
<td>Dec. 3 In-class work on Team Project</td>
<td>TBA</td>
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<tr>
<td>15</td>
<td>Dec. 10 In-class work on Team Project</td>
<td>TBA</td>
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Additional readings may be assigned as necessary throughout the semester.