EST 582 Introduction to Systems Concepts
Split form class: Face-to-face and on-line

This is the FTF syllabus
Frey Hall 216 5:30-8:20
Two lectures: 5:30-6, 6-6:30
Discussion 6:30-7:30 Group Work Mon 7:30-8:20

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Office Hours:
M 2-5 Fr 9-12

Systems thinking requires changing perspectives on how to analyze problems and seek solutions. Socio-technological systems are the more complicated kinds of systems that require integrating knowledge of technologies with human elements. We will examine common systems through engineering, political, social, and ethical analyses.

Learning Outcomes
1) Gain fluency in systems vocabulary and concepts
2) Combine technical and social aspects to explain complicated phenomena
3) Demonstrate some mastery of socio-technological systems concepts

Required texts:


**Grading:**
- Readings: 10%
- Group Work Participation: 10%
- Homework: 10%
- Midterm: 20%
- Paper: 50%

**Readings:**
1 page summary of every reading assignment required by Mon class time.

**Home Work:**
Individual submissions due before following Mon class

**Midterm**
Take-home. Do not collaborate. Issued Mon week before spring break; due Mon after spring break

**Paper**
Three choices:
1) Fossil fuel electricity
2) Shopping through Amazon
3) Twitter
Explain the technical framework for these systems using systems vocabulary and technical details. Show how social considerations are essential to explain the benefits and problems associated with these systems, and to create a complete understanding of the system. You are invited to offer means to improve these systems that use concepts explored in the class. (10-20 pp.)

These are not intended to be intense research papers regarding the engineering aspects of the systems; however, provide references for what you explain.

**Plagiarism**
Plagiarism is presenting someone else’s work as your own. It consists of copying, intellectual property theft, and unauthorized collaboration. Do not copy material from the web or other sources for homework, exams, presentations, papers, etc., without properly citing. Do not use someone else’s ideas or work without sufficient attribution (be careful and record “who, what, and where” when researching) (find examples from professional research work for referencing and use that) (do not cite generic websites – [www.wikipedia.org](http://www.wikipedia.org) – as that is a meaningless reference). Do not work with someone else if the work is supposed to be your own.

All plagiarized submissions will be scored as 0. Plagiarism has resulted in failing this class, and even in dismissal from graduate school.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading discussions</th>
<th>Group Work</th>
<th>Reading Assignment (for next class)</th>
<th>Assignments (for next class)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/27</td>
<td>Introduction to Systems Feedback</td>
<td>Syllabus</td>
<td>Feedback examples</td>
<td>Truxal pp. 1-38</td>
<td>HW#1</td>
</tr>
<tr>
<td>2/3</td>
<td>Complicated-complex systems Modeling</td>
<td>Truxal</td>
<td>Systems analysis: automobile</td>
<td>Meadows pp. 1-72</td>
<td>HW #2</td>
</tr>
<tr>
<td>2/10</td>
<td>Systems dynamics modeling 1 &amp; 2</td>
<td>Meadows Part 1</td>
<td>Home heating systems</td>
<td>Meadows pp. 75-141</td>
<td>HW #3</td>
</tr>
<tr>
<td>2/17</td>
<td>Socio-technical systems concepts Socio-technical system example</td>
<td>Meadows Part 2</td>
<td>Immigration as a socio-technical system</td>
<td>Meadows pp. 145-185</td>
<td>HW#4</td>
</tr>
<tr>
<td>3/2</td>
<td>LI Suburbanization Traffic patterns</td>
<td>Sugiyama et al.</td>
<td>Propose road system changes to LI</td>
<td>None</td>
<td>HW #5</td>
</tr>
<tr>
<td>3/9</td>
<td>Learning Cybernetics &amp; the classroom</td>
<td>Syllabus</td>
<td>Topics for midterm (group review)</td>
<td>Scheffer Ch 1-3, 7</td>
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<tr>
<td>3/16</td>
<td>No class -- Spring break</td>
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<td></td>
<td>Midterm! Due 5 pm 3/23</td>
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<tr>
<td>3/23</td>
<td>Stability &amp; Transitions More Systems Transitions</td>
<td>Scheffer Part 1</td>
<td>Explain Fig 2.9 completely</td>
<td>Waldrop 2018</td>
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<td>3/30</td>
<td>Agent models Simple agent models</td>
<td>Waldrop 2018</td>
<td>The Game of Life</td>
<td>Watch <strong>The Big Short</strong></td>
<td>HW#6</td>
</tr>
<tr>
<td>4/6</td>
<td>Economic Systems The Great Recession</td>
<td><strong>The Big Short</strong></td>
<td>Join a research group</td>
<td>Scheffer Ch 12-14, 16, 18</td>
<td></td>
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<tr>
<td>4/13</td>
<td>Plastics Plastics in our World</td>
<td>Scheffer Part 2</td>
<td>Research group meeting #2</td>
<td>None</td>
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<td>4/20</td>
<td>Bureaucracies Public School Systems</td>
<td>SBU as a system</td>
<td>Research group meeting #3</td>
<td>None</td>
<td>HW#7</td>
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<tr>
<td>4/27</td>
<td>Communication Systems Smart phones</td>
<td>HW#8</td>
<td>Research group meeting #4</td>
<td>Thyberg &amp; Tonjes 2018</td>
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<td>5/4</td>
<td>Socio-techno-environmental systems</td>
<td>Thyberg &amp; Tonjes 2015</td>
<td>Supervised work on your own</td>
<td>None</td>
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<td>5/11</td>
<td>No class meeting</td>
<td>Paper due Mon 5/11 @ 5 pm via BlackBoard</td>
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DISABILITY SUPPORT SERVICES (DSS) STATEMENT
If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, Room 128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: http://www.stonybrook.edu/ehs/fire/disabilities

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Intellectual honesty is the cornerstone of all academic and scholarly work. Therefore, the University views any form of academic or scholarly dishonesty as a serious matter. Instructors are required to report all allegations of academic or scholarly dishonesty to their Graduate Program Director and the student’s home Graduate Program Director if different. Furthermore, Graduate Program Directors must report all incidents in which a student is found guilty to the Graduate School. Additional details on procedures for hearings and other functions at the judiciary processes are available in the Grievances and Appeals section of the Bulletin (http://sb.cc.stonybrook.edu/gradbulletin/current/regulations/academic_probation/appeals.php)