SySc 513: Systems Approach (4 cr hr)
Spring Quarter, 2008, TuTh 4:40-6:30pm, 201 OND
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Course Web Site:http://www.pdx.edu/sysc/courses_spring2008.html -- select Systems Approach

ASSIGNMENTS -- Modified (April 21, 2008)

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Week 1:

Given on: Tues., April 1, 2008. Due: Thurs., April 3, 2008.

I. To consolidate overview of a Systems Methodology given on Tuesday, read and study

Lendaris, G.G.: "On Systemness and the Problem Solver: Tutorial Comments," **IEEE Transactions on Systems, Man & Cybernetics**, pp. 603-610, Vol. SMC-16, No. 4, July, 1986. [Available on class Web site as pdf file.]

and read

Hall, A.D.: "Three-Dimensional Morphology of Systems Engineering," **IEEE Transactions on Systems Science and Cybernetics**, pp. 156-160, Vol SSC-5, No. 2, April, 1969. [Available on class Web site as pdf file.]

Note: We will read more by Hall later in his text.

BOTH READINGS ARE AVAILABLE ON-LINE AT COURSE WEB SITE.

Prepare at least three questions with respect to the material of the Lendaris paper, to be used as a basis for stimulating **in class** dialogue next time. We will devote 1 hour of class time exploring areas suggested by your questions.

Please keep in mind that a major chunk of this course's material will be devoted to the idea of "multiple perspectives." Let us make sure we understand the essence of this idea in the *vertical* direction and in the *horizontal* direction (the latter will be expanded later via the Linstone readings).

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Week 2:

For Tuesday, April 8, 2008

1. **Read:** Senge, *The Fifth Discipline*, Chapters 1 - 5.
2. **To be written and turned in:**
   a. Outline the key ideas in Chapter 1.
   b. Give an illustrative example of each of the seven learning disabilities described in Ch2.
   c. Describe what is meant by the term 'systemic structure' as outlined by Senge in Ch 3.
   d. Describe what is meant by 'generative' and 'generative learning', as used in Ch 3.
   e. Drawing upon a personal example, describe a situation that can be explained as either a balancing or reinforcing circle diagram as explained in Ch 5.
3. **Read:** Rabow, et al, *Hill's Learning Thru Discussion.*
   a. Familiarize yourself with the "Cognitive Map" outline in Table 4.2 on page 40. If you have any questions, bring them up in class on Tuesday, as your Thursday assignment requires use of it. [Sample CogMap available on class Web site as pdf file.]

For Thursday, April 10, 2008

1. **Read:** Linstone, ...*Multiple Perspectives...*, Chapters 1 - 3.
2. **Written:**
   a. For Chapter 2, prepare a list of key topics and associated (pre-though-out) items to serve as notes for <u>your</u> participation in class discussion. [These are for your use, <u>not</u> to be handed in.]
   b. For Chapter 3, **Cognitive Map** (hand in):

   For Cognitive Map **step 6, Application of the material**, take time out and re-think about some personal situation you previously experienced, where this time you consciously fashion three different perspectives (as suggested in the text) from which to consider that previous experience. Make notes about this in your Cognitive Map, but more importantly, <u>be prepared to describe the situation</u> and to share your added insights during class dialogue.

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WEEK 3:

For Tuesday, April 15, 2008

A. Read: Inquiring Systems articles [Available on course Web site as pdf files.]

1.) Mitroff & Turoff, "Technological Forecasting and Assessment: Science and/or Mythology," *TF&SC*, American Elsevier, pp. 113-134, 1973.

2.) Turoff & Mitroff, "A Case Study of Assessment Applied to the 'Cashless Society' Concept," *TF&SC*, American Elsevier, 1974.

To be written and turned in: preparation ***of your choice*** to serve as basis for class dialogue on the five different ISs described and discussed in the readings.

Note: The focus topic for this assignment is *inquiring systems*, **not** *technological forecasting* -- the latter is just the context within which the focus topic was presented.

3.) Read: Hall, *Metasystems Methodology*, Chapter 4, and prepare a **Cognitive Map** (to be turned in) for this chapter, BUT, the class dialogue will focus on correspondences between Hall's topics: Systems Approach, and the Scientific Method, and the different Inquiring Systems of Churchman.

B. We will do an in-class "mini debate" on the issue of

How best to investigate the large-scale replacement of transportation by communication in society?

The class will break up into 5 sub-groups, each to advocate a particular position based on one of the methods of inquiry studied for this class. Please think about such a context as background preparation for the debate activity.

For Thursday, April 17, 2008

A. Read/study Linstone: Chapter 4 & 5.

[This reading is intended as a reinforcement of ideas.]

Prepare a COMBINED Cognitive Map for Linstone Chapters 4 & 5, to be handed in.

As you will note, the authors have organized their presentations according to the specific topics under discussion, and within each one, present T, O & P aspects. For your Cognitive

Map sections 3 + 4, I suggest that you use T, O & P as 3 separate headings, and accumulate appropriate information from each of the topic areas within these headings. You might also include a 4th heading in this section, to include items you want to include, but don't naturally fall under the T, O or P heading.

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WEEK 4:

For Tuesday, April 22, 2008

Read: Senge, *The Fifth Discipline*,
Ch 6: Nature's Templates
App. B: Systems Archetypes

To be written and turned in:
Cognitive Map for Chapter 6.
Your choice of notes for class dialogue about material in Appendix B.

For Thursday, April 24, 2008

Read: Senge, *The Fifth Discipline*,
Ch 7: Self-Limiting or Self-Sustaining Growth
Ch 8: Personal mastery

To be written and turned in:
Cognitive Map for Senge Chapter7.
Cognitive Map for Senge Chapter 8.

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WEEK 5:

For Tuesday, April 29, 2008

Read/study: Linstone Chapters 3 (repeat reading), 9, and Appendix A.5

I am requesting that you perform a **"thought experiment"** as follows: Based on some previous experience of yours (so all pertinent data is already available in your memory banks) that involved an important **decision** in your life, follow the definitions, suggestions, and instructions about carrying out Multiple Perspectives by Linstone, and analyze your previous experience via the TOP method. You will have to do a lot of mental "shifting of gears" in order to approximate the suggested roles (T, O, & P) required to carry this out. Any new insights about your (previous) decision?

The material you write up will be used as a basis for class discussion/dialogue next week. Make the write up appropriate for **handing in**.

For Thursday, May 1, 2008

Read: Senge, *The Fifth Discipline*,
Ch 9: Mental models
Ch 101: Shared Vision

To be written and turned in:
Cognitive Map for Senge, Chapter 9.
Cognitive Map for Senge, Chapter 10.

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WEEK 6:

For Tuesday, May 6, 2008

Read: Hall, *Metasystems Methodology*
Ch. 1: Overview of systems methodology

To be written and turned in:
Cognitive Map for Chapter 1

For Thursday, May 8, 2008

Read: Hall, *Metasystems Methodology*
Ch. 2: Basic Percepts, Concepts, and Precepts

To be written and turned in:
Cognitive Map for Hall, Chapter 2.

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Week 7:

For Tuesday, May 13, 2008

Read: Senge, *The Fifth Discipline*, Ch 11: Team Learning
Warfield, *Societal Systems*, Ch 3: The Organized Conduct of Inquiry.
[Available on course Web site as pdf file.]

To be written and turned in:
Combined Cognitive Map for Senge, Chapter 11 and Warfield, Chapter 3.

For Thursday, May 15, 2008

Read: Hall, Ch 5: Problem Finding & Problem Definition
Lendaris, "On Human Aspects of Structural Modeling". Focus on pages 329-334, browse the remaining pages. [Available on course Web site as pdf file.]

To be written and turned in:
Cognitive Map for Hall, Chapter 5.
Notes of your choice for Lendaris reading

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WEEK 8:

For Tuesday, May 20, 2008

Read: Hall, Ch 6: Building the Normative Scenario
Senge, *The Fifth Discipline*, Ch 17 of First Edition: "Microworlds"
[Available on course Web site as pdf file.]

To be written and turned in:
Cognitive Map for Senge, Chapter 17 of First Edition.
Cognitive Map for Hall, Chapter 6.

For Thursday, May 22, 2008

Read: Hall
Ch 8: Basis of Systems Methods in Casuistry
Ch 10: Systems Synthesis, Analysis & Optimization

To be written and turned in:
Cognitive Map for Hall, Chapter 8.
Notes of your choice for Hall, Chapter 10 -- NOT to be handed in.

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WEEK 9:

For Tuesday, May 27, 2008

Read/study Delp, *Systems Tools for Project Planning:* Ch III, IV, V, VI, IX (selections) [available at SmartCopy]

Make notes of your choice to assist us in class dialogue (NOT to be handed in).

I will give a short overview lecturette on the material at the beginning of class.

For Thursday, May 29, 2008

Read and prepare **one combined** Cognitive Map for the following three papers on the ISM methodology: [All available on course Web site as pdf files.]

Malone, D., "An Introduction to the Application of Interpretive Structural Modeling", Chapter 14 in Baldwin, Ed., *Portraits of Complexity*, Batelle Memorial Institute, Columbus, OH, Monograph No. 9, 1975.

Lendaris, G.G., "Appendix B: Interpretive Structural Modeling", in *The Use of Structural Modeling for Technology Assessment*, vol 2, Portland State University, Systems Science, 78-1, 1978.

Warfield, J.N., "Interpretive Structural Modeling", Chapter 14 in *Societal Systems*, Wiley, 1976.

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WEEK 10:

For Tuesday, June 3, 2008

Read/study Senge, *The Fifth Discipline*: Ch 12-15 (pp.255-340)

Make notes of your choice to assist us in class dialogue (NOT to be handed in).

For Thursday, June 5, 2008

Read/study Senge, *The Fifth Discipline*: Ch 16-18 (pp. 341-382).

Make notes of your choice to assist us in class dialogue (NOT to be handed in).

This class dialogue may be considered an opportunity to bring up any items/questions of interest to you for all of the Senge material--including any that you may have wanted to bring up earlier, but for whatever reason it didn't happen.

As preparation for in-class ISM session: Read/study the list of (approx.) 15 items handed out on Tuesday, and "subconsciously" ruminate over them over the next two days, so we can do an ISM session in class (approximately half of the class period will be devoted to an ISM session). You will collectively fill the "Participant" role, I will fill the Facilitator role, and xxxxxx will fill the Method Technician role.

FINAL EXAM:

Take home exam to be handed out on Tuesday, June 3rd, and due on Tuesday, June 10th, by 5:00 PM in my office (Rm. 206, Systems Science/Harder House building, on SE corner of 10th & Market streets), or in my mailbox if the SySc office is open.