SW 266 An Approach to System Thinking

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Campus: O'Hare; Saturdays

Background:
Tom Long is a successful senior executive with 30 years of experience in starting, managing and turning around business groups both domestically and internationally. He has worked as a senior executive and general manager in a small, privately held company, a venture backed startup, several large partnerships and several large corporations. In all cases he has demonstrated leadership skills in both startups and turnarounds He is an Executive Associate, accredited by the Institute for Independent Business, focused on helping business owners to overcome their many business challenges and find time again for themselves. Tom is a graduate of Rensselaer Polytechnic Institute, Rutgers University and The Stanford University School of Business.

Abstract:
This course will introduce students to the basic concepts of systems thinking using dynamic systems modeling techniques. The primary emphasis in the course will be the introduction of basic systems fundamentals and the actual construction of several business process models.

Competencies
This course is being offered to fulfill competencies L-7, H-2-C, S-1-D, S-1-X, S-5, F-X.

L-7 Collaborative Learning: Can learn collaboratively and examine the skills, knowledge, and values that contribute to such learning.
H-2-C Can identify an organizational problem and design a plan for change based on an understanding of change theories or models.
1. Identifies one or more problems of strategy, structure or process that affect an organization
2. Describes one or more change theories or models that explain these problems.
3. Uses these theories or models to address the problem(s).
S-1-D Can understand general computing principles and solve problems using computer-based applications within workstation or PC platforms. (must have 4of 5): platform proficiency; graphic user interfaces; knowledge of software design; spreadsheets and database tech; computer-based communications tech.

The student project should focus on:
1. Assessment of a problem
2. Design and planning for its solution
3. Student interaction with the problem.

S-1-X The S-1-X competence is a student-written competence in the S-1 category, "Experiencing Science" which focuses on "hands-on" direct applications of scientific and/or technical knowledge. Student must submit a statement for approval by the instructor at the start of the term.

S-5 Information Technology: Can use contemporary information technology effectively.

F-X The F-X competence is a student-written competence in the Focus Area and, as such, will reflect the particular expertise the student is developing in his or her customized concentration. Student must submit a statement for approval by the instructor at the start of the term. Or the following may be used:
FX - Can demonstrate an understanding of Basic Systems Thinking by using dynamic Systems Modeling to identify and solve systems problems in business, science, social science or other disciplines identified by the student.

Learning Objectives
Upon successful completion of the course, students will have demonstrated a hands-on understanding of basic System Dynamic principles:

1. The feedback loop is the basic structural element of systems.
2. Levels and rates are fundamental to loop structure.
3. Rates depend on levels and constants.
4. First-order loops exhibit exponential behavior.
5. Simple, second order negative loops exhibit sinusoidal oscillation.
6. Higher-order, positive-feedback loops usually show exponential behavior.
7. Every system has a closed boundary.
8. Model validity is a relative matter.

Approach
The primary approach throughout the course is a combination of lecture and computer modeling demonstrations and an emphasis on practical, hands-on use of modeling tools to solve problems.
Early models will emphasize key systems concepts while later models will demonstrate the power of this thinking approach when dealing with complex systems.
Both the mid-term and final exams will consist of models built and documented by the students.
Homework will consist of reading and model development.
Computer skills can add value, but are not required.

Criteria for Assessment:
Evidence
General:
Students will be evaluated on a combination of factors including (but not limited to):

- Class participation.
- Completion of homework both reading and written.
- Demonstrated ability to evaluate and manipulate pre-existing models.
- Ability to use resources effectively to research assigned topics.
- Ability to choose, define, develop and document a complex model of interest to them personally.

Since the purpose of feedback is to foster growth and development, students can expect my feedback to embody the qualities of clarity, integrity, flexibility and empathy.

Grading:
Class Participation - 10%
Midterm - 30%
Student Project - 30%
Final Exam - 30%.

Coursework:
The homework will be designed to review the material used in class and provide a chance for hands-on application of the concepts. The final exam/assignment will be a larger assignment designed to review material throughout the course and provide opportunity for demonstrating application of the material.

Grading Scale:
90-100 A
80-89 B
70-79 C
60-69 D

Timeframe
This course is planned for ten classes at three hours per class.
Resources Used/Required:
System Thinking Basics From - Concepts to Causal Loops; (STB) Anderson and Johnson, Pegasus Communications, Cambridge, Massachusetts (1997)

It is highly recommended that students have:
Solid experience using PC computer technology including use of the World Wide Web as a resource.
An ability to use word-processing and presentation software.
But, no programming experience is required and this is not a programming course.
Academic Integrity
All students are expected to adhere to DePaul University's academic integrity policy. (See http://www.depaul.edu/~handbook/code17.html)

Topical Outline/Class Schedule
Class 1 What Are systems and What Is Systems Thinking?
Class 2 Uncovering Systemic Structures.
Class 3 Management Simulation
Class 4 Complex systems
Class 5 Applying Systems Thinking and The System Archetypes
Class 6 Getting Started With Stocks And Flows.
Mid-Term Exam (Open Book)
Class 7 Basic Functions With Stocks And Flows.
Class 8 Working With Stocks and Flows
Class 9 Student Presentations And Additional Work With Stocks And Flows
Class 10 Student Presentations And Additional Work With Stocks And Flows
Final Exam-Take Home

The following are the criteria for the L-7 competence:
Competence: L-7: Can learn collaboratively and examine the skills, knowledge, and values that contribute to such learning.

Learning From Experience

Criterion

Specifications

Meets

Needs Improvement - note area/s for development

Can reflect on experiences through a collaborative process
Describes 2 or 3 experiences of working with others in a collaborative experience.

Can articulate differences between learning independently and learning collaboratively.
Tell how collaboration differs from one's experience of learning on one's own. Was it better/worse? Were there barriers? Was the outcome better than one could do on one's own?

Can assess one's abilities as a collaborative learner and identify areas for growth.
Describe one's own abilities from the following perspectives:

- Listening
- Asking questions
- Providing feedback to others

Describe one's strengths and what might improve them.

Can support the self-assessment of others through effective feedback.

Give an example of feedback provided to collaborators. Include in the feedback

- A process for providing critical feedback while respecting the dignity of others
- What specifically helped the group improve as a result of the feedback
- How to use questions as a stimulus for learning from feedback

Inquiry

Criterion

Specifications

Meets

Needs Improvement - note area/s for development

Can articulate problems and questions that can be researched and resolved in a working group.

Give an example of a question/hypothesis the collaborative group engaged. Tell how the group elaborated on the question/hypothesis to make the collaborative inquiry richer and clearer as a result of collaborative dialogue.

Can demonstrate active listening skills.

Give an example of an experience where you were challenged by the ideas, concepts, and/or interactions of others in the group. How did you engage the challenge, eg, could you change your position, could you describe what it would take to change your position? Did this process contribute to the learning of the group?

Decision Making

Criterion

Specifications

Meets

Needs Improvement - note area/s for development

Can understand and apply a model of group problem solving, decision making, and/or learning.

Ground the group experience in the context of a collaborative model or theory engaged in the class.