College of Public Health & Health Professions

PHC-6103 Systems Thinking for Public Health

Summer, 2013

May 15 – June 28
Tuesday and Thursday 1:00 – 3:45 PM

Course Managed on Sakai (E-learning) Website

Instructor Information

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HPNP Adjunct Office
By appointment - Please contact the instructor through the Sakai website

Course Overview or Purpose

The course will demonstrate models for understanding large systems with an emphasis on problems of public health and public health related organizations. Analytical and systems approaches will be contrast and compared as tools for managing in complicated systems and for introducing change. Students will learn fundamental properties and dynamics of all systems (such as natural and mechanical systems, organizations, political cultures and others) and learn leveraged approaches to intervening to address system deficiencies. Students will gain experience in developing a shared team vision of complex, interrelated systems and will participate in exercises that simulate tactical interventions to predict reasonable outcomes and detect unintended consequences when they occur.

Course Objectives and/or Goals

Upon successful completion of the course students should be able to parse the major systems in a complex situation, critically describe interrelationships, envision a desired state and suggest interventions with verifiable milestones. Students will learn to combine empirical and narrative methods and facilitate group processes to accommodate financial, political, social, scientific and other points of view while moving toward clear common objectives. These skills are important in managing organizational change, for developing position papers, creating strategic and business plans, and in effective grant writing.

Course Materials and Expectations of Students

“The Fifth Discipline” by Peter Senge

"Systems Thinking: Managing Chaos and Complexity" by Jamshid Gharajedaghi

Other articles and readings will be assigned over the course of the semester.

Students are expected to have a working knowledge of Microsoft PowerPoint. see my *Power Point Primer in resources for Minimal Standards for Submissions.* One portion of the exercise will require the use of a personal computer with Microsoft Access version 2007. Equipment and software are available in the Health Science Center Library. Knowledge of Access programming is not required.

Course Requirements/Evaluation/Grading

See Outline Below

Outline (timing and order subject to change)

1: Class Introductions, Practical Information

Discussion: Student Career Goals – Survey Monkey

The Syllabus

The General Flow of the Course

- Nature of the Problem and the Problem as Seen in Nature
- State of the Practicing Art
- Theory
- Practical Approaches and Archetypes
- Simulation Exercise Field Observations
- Field Visit – Complex Systems in situ
- Mapping a Complex System - Group Exercise

Student Evaluation Methodology

- Initial Narrative and Diagrams (15%)
- Two Tests (15%, 20% = 35%)
- Final Project Diagram and Narrative (25%)
- Attendance and Participation (20%) – helmet stickers

Expectations Regarding the Material in Textbooks

2: Brief Introduction to Systems at Devil's Millhopper (weather permitting)

Managing Complexity – Four Big Theory Gaps
- Emergent Properties (the whole is not the sum of the parts)
- Illusory Time (can distort our perception of systems)
- Shifting Context (constantly changing boundaries)
- The Illusion of control (limits to our influence)

Systems Theory Meets Social Theory
Open and Closed Systems, Boundaries, Interfaces
Systems within Systems with Sub-Systems
Organizational, Political, and Cultural Systems (Environments)
Importance of Context

Natural Systems meet Purposeful Human Systems (a walk in the park)

3: Simple Closed Systems (Mindless Systems)

The Electrical Wiring Metaphor
Class Exercise: Wiring and Circuits
Cycles of Throughput (Current)
Conductivity, Resistance and Uneven Throughput
Batteries, Capacitors and Storage
Branching Logic and Boolean Math
Accelerating and Stabilizing Influences
Human Interaction with Closed Systems
Feedback Loops
Modularity

4**: Purposeful Systems (Gharajedaghi chapters 1 -3)**

Analytical vs. Systems Approach
Goal Seeking Systems – Growth and Efficiency
The Paternalistic Model of Ownership and Control
Division of Labor and "Staff" Level Management
Financial, Operating and Management Control and Decision Support Systems
Market (Simple Goal) v. Mission (Higher Order) Motivation
Success and the Ensuing Issues of Large Scale
Roles vs. Mindless Algorithmically Controlled Components
Ownership, Governance, Management and Production Roles
The Marriage of Mechanical and Human Systems
The Centralize to Decentralize Pendulum
Complexity: "Predict and Prepare"

5: Philosophical and Theoretical Underpinnings and Practical Application

Emergent Properties – What is Greater than the Parts?
Dialectical Properties of Systems: Chickens and Eggs
Archetypes: Well-Worn Paths and Practical Tools
Natural Properties of Systems – Senge's Archetypes from Nature
Class Discussion "Limits to Growth"
Class Discussion "Shifting the Burdon"
Complexity: The Cumulative Qualities Human Knowledge
The Emergence of Multi-Minded Organizations
Public Health, Biology, Psychology, Ecology, Examples
Networks: Google, Facebook and the Wiki World
Assignment: One page Narrative from Current Events

6: Multi-minded Systems that Grow and Change: Part 1

Class Exercise: Interrelated and Complex Systems

7: Multi-minded Systems that Grow and Change (Seemingly on Their Own) Part 2

Class Discussion: Legos Exercise
The Infiltration of Systems
How is it Useful If Everything Relates to Everything?
Mental Models, "Desired States", Shared Objectives
Processes (Purposes) as a sort of Glue
Control vs. Influence
The "zero-sum" game
Blueprints and Roadmaps
Orders of Systems: Nested, Hierarchical, Peer Systems in Environments
Cultural Systems: Political, Belief and Ethical Systems
The Players: Teams, Guilds, Parties, Factions, Stakeholders
Beyond the Passive and Reactive Parts
Assignment: Read the Guano article (NYTimes)

8: Parsing and Diagramming Complex Systems

Class Exercise: Diagram key features from The Guano article (NYTimes)

Throughputs
Processes
Desired State(s)
Structures: Organizations, Technologies, Stockpiles

Directional Connectors
Call-Outs

Assignment: Diagram a System from Current Events (TBD)
One Power Point Slide Submitted through Sakai

9: Leadership Styles and Practical Application

Senge's Personal Mastery, Mental Models, Shared Vision, Team Learning
Discovering Underlying Structures
Consensus, Unanimity, Plurality
Senge's Dialogue and Discussion
Gharajedaghli's Conflict, Coalition, Competition, Cooperation
The Role of the Facilitator
Senge's Seven Learning Disabilities of Organizations

Discussion: Select Problems for the Scenario Planning Exercise

10: Working From the Big Picture Down: Predict and Prepare

Class Exercise: Scenario Planning

Enumerating Variables
Reducing Variables to a Critical Set
Identifying Controllable and Uncontrollable Variables
Interrelating Multiple Subsystems
Scenario Planning

Assignment: One Page Narrative based on one Quadrant of the Matrix
Submitted in one page word document via Sakai

9: Individual Projects (5-7 well annotated power point slides)

Individual projects will parse the salient features (environment, structures, processes, organizations, pathways) of a complex system of your choosing on. Each student will be responsible to schedule two 20 minute one on one meetings.

Meeting 1: Approve the Subject Matter in Concept
Meeting 2: Critical Review and Mid Course Corrections.

Assignment: Projects due at least one week prior to the end of the semester.

10: Working from the Parochial View Upward: A Division in an Academic Medical Center

Clinical Divisions as a Multi-Minded Organization
The University and College of Medicine Structure
The Faculty Practice Structure
The Teaching Hospital Structure
The Budget Process
The Recruitment Process
The Quality Assurance Process
Establishing a Desired State

11: Computer Lab Exercise: Academic Medical Center Simulation

12: Open Systems Exercise: Community Based Open System

Each semester a community based agency is highlighted as an example of an open system in public health or public policy. This typically involves an offsite session. The agency will be announce in the early part of the semester.

Assignment: One Page Narrative with Diagram (one power point slide)

13: Measurement: Idiots Guide to Statistics

Statistical Methods
Co-linearity
Standardization of Variables
Simple Regression Analyses
Multiple Regression Analyses
Analyses of Variance and Covariance
Multiple Correlation Analysis

14: Feedback

Continuous Improvement
How can the course be made better for the next cohort?

Note: The sequence of sessions is subject to change. Outline numbers may not exactly align to lectures.

Statement of University's Honesty Policy (cheating and use of copyrighted materials)

Academic Integrity –*Students are expected to act in accordance with the University of Florida policy on academic integrity (see Student Conduct Code, the Graduate Student Handbook or this web site for more details: **www.dso.ufl.edu/judicial/procedures/academicguide.php**).*

Cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior.

We, the members of the University of Florida community,
Pledge to hold ourselves and our peers to the
Highest standards of honesty and integrity.

Policy Related to Class Attendance

Attendance and Make-up Work *– Students are expected to attend and participate in all class sessions and will be graded on the quality of their participation. Material will not be repeated. Unusual personal issues with respect to class attendance or fulfillment of course requirements will be reviewed on an individual basis but, after two excused absences, students should generally expect a reduction in their grade for additional absences.*