

Human System Dynamics

or

Modeling and Control of Social Systems

In this class we explore the principles and intuitions of system dynamics as applied to human systems, such as societies, subcultures, working groups, relationships, and individuals in social contexts. Human System Dynamics is an emerging field constantly trying to synthesize an endless collection of subtle and counterintuitive observations. This class emphasizes the methods of thinking behind system dynamics by discussing and modeling some of those important observations.

As an exploration, this class will be driven by readings and discussion, and by all participants contributing what they learn from their models. The course will progress from a high-level discussion of society-wide mechanisms to the dynamics occurring around and within individuals, each discussion informed by and informing the others. Along the way, we will discuss the recurrence of certain variables and behaviors at multiple levels of society, including the effects of power and diverse needs, feedback, over-determinacy, homeostasis, and crisis.

Class Structure

The following proposal is for a 2 credit class.

Class Meetings: 2 hours / week :

Class meetings will consist mostly of discussion, in-class exercises, and lecture.

Readings: 2 hours / week :

The readings listed are to be done before their associated class meetings, and will amount to approximately 40 pages per week.

Assignments: 2 hours / week :

Assignments include modeling (in Stella and Matlab) and analysis, and 'social' exercises, involving observation and group experiments.

The last three weeks will be devoted to independent or group projects, which may include modeling, writing, research, experiments, and personal interests.

Grading will split as follows:

Readings: 40% :

Students will grade themselves based on how much of the readings they did.

Class Participation: 40% :

Determined by instructor, based on involvement in discussions and involvement in exercises.

Final Project: 20% :

Determined through methods and deliverables chosen by the student, which may include a report, presentation, or poster.

Syllabus

Week 1: What is Human System Dynamics? –

Topics: Define Systems Dynamics and Human Systems; relations to Sociology, Anthropology, and Psychology; goals and structure of the class.

Exercise: Introduction to Stella

Week 2: An Introduction to System Dynamics –

Topics: Elements of systems and common behaviors, points of wisdom from the study of systems; causal vs. cybernetic thinking

Reading: “The Origin of ‘System’” by Lee Perlman (email); Excerpts from *General Systems Theory: Foundations, Development, Applications* by Ludwig von Bertalanffy.

Exercise: Population modeling in Stella

Week 3: The Dynamics of Society –

Topics: What is society? Technology’s effects on society; local maxima and minima.

Reading: Excerpt from *The Tipping Point: How Little Things Can Make a Big Difference* by Malcolm Gladwell; Excerpt from “Counterintuitive Behavior of Social Systems” by Jay W. Forrester.

Exercise: Design a model of Olin, including notable power structures and variables that influence short and long-term behavior (2 weeks).

Week 4: The Motivating Forces of History –

Topics: To what extent is history predictable? What characterizes the current historical scene?

Reading: Excerpt from *The Fourth Turning* by William Strauss and Neil Howe; Excerpt from *Phenomenology of Mind* by G. W. F. Hegel.

Exercise: Look up online survey information over multiple years and apply Fourier analysis to find the natural rhythms involved, if any.

Week 5: The Tools of Society –

Topics: Economics; the use of punishment and shame in society; *Waking Life* and living dreams.

In Class: Watch *Isla de Flores* (15 min)

Reading: Excerpt from *Mutual Aid: A Factor in Evolution* by Peter Kropotkin; Excerpt from *Discipline and Punish: The Birth of the Prison* by Michel Foucault; Excerpt from *Wealth of Nations* by Adam Smith.

Exercise: Keep a journal of the times you felt shame during the week.

Week 6: The Structure of Culture –

Topics: Memes, social groups; teaching culture and passing on traditions.

Reading: “Memes vs. Genes: Notes from the Culture Wars” by Mihaly Csikszentmihalyi; Excerpt from *The Rites of Passage* by Arnold van Gennep.

Exercise: Catalogue the history of memes and attempted memes in your time at Olin; design a new meme and try to promote its survival.

Week 7: Group Dynamics and Uses of Power –

Topics: Reinforcing factors in large groups, conflict resolution, power and expectations in groups.

Reading: Excerpt from *Sitting in the Fire: Large Group Transformation Using Conflict and Diversity* by Arnold Mindell; Excerpts from *How Children Fail* by John Holt; The Stanford Prison Experiment

Exercise: Use your favorite programming language to model many individuals in groups, according to a schema provided (2 weeks).

Week 8: Systems Dynamics in Human Relations –

Topics: Transactional Analysis; roles and scripts; common group alignments.

Reading: Excerpt from *Games People Play: The Basic Handbook of Transactional Analysis* by Eric Berne, M.D.; Excerpt from *Alienation and Charisma: A Study in Contemporary American Communes* by Benjamin Zablocki

Exercise: Diagram the relationships in a group you participate in.

Week 9: Myers-Briggs Personality Types –

Topics: Myers-Briggs Typing; Motivation, Energy, and Gumption; Holistic models of human beings

Reading: Excerpts from *Please Understand Me: Character and Temperament Types* by David Keirsey and Marilyn Bates, *Survival Games Personalities Play* by Eve Delunas, *Zen and the Art of Motorcycle Maintenance* by Robert M. Pirsig

Exercise: Determine your Myers-Briggs personality type; Design a Stella model of yourself, including your motivations and life situation (2 weeks).

Week 10: The Role of the Subconscious –

Topics: Collective Unconscious and archetypes; reflections on multiple levels of society; Subconscious behaviors; Neurolinguistic programming

In-Class: Mirroring exercise

Reading: Excerpts from *The Archetypes and the Collective Unconscious* by Carl G. Jung; Excerpt from *My Voice Will Go With You: The Teaching Tales of Milton H. Erickson, M.D.* ed. by Sidney Rosen; Excerpt from *Patterns of the Hypnotic Techniques of Milton H. Erickson, M.D.* by Richard Bandler, et. al.

Exercise: Practice NLP on your friends

Additional Notes

Additional Readings:

- Excerpts from *Gödel, Escher, Bach: An Eternal Golden Braid* by Douglas R. Hofstadter on holism and group behavior in brain.
- Excerpts from *Urban Dynamics* by Jay W. Forrester
- “Simulating Hamlet in the Classroom” by Pamela Lee Hopkins
- Excerpts from *Elmtown’s Youth: The Impact of Social Classes on Adolescents* by August B. Hollingshead
- Excerpt from *War and Peace* by Leo Tolstoy
- Excerpt from *Social Marketing: Strategies for Changing Public Behavior* by Philip Kotler and Eduardo L. Roberto
- Excerpt from *Civilization and its Discontents* by Sigmund Freud.
- Excerpt from *Eros and Civilization* by Herbert Marcuse
- Articles from *WorldChanging: Models, Tools, and Ideas for Building a Better Future*, at <http://www.worldchanging.com/>

Potential Speakers:

- Robert de Marrais on Emotional-Affect-Response, Catastrophe and Chaos, and Cultural Myth.
- Claudia Gold on Punishment, Politics, and Culture.
- Nirav Shah on the underlying system laws and improving engineering through system dynamics knowledge.
- Vanessa Layne on the wisdom of system dynamics.