



Engineering Systems Doctoral Seminar

ESD.84 – Fall 2002

Session 9

October 30, 2002

Chris Magee and Joel Cutcher-Gershenfeld

Guest: Thomas Hughes



Session 9: Overview

- Welcome and Overview and Introductions (5-7 min.)
- Dialogue on Melanie Mitchell's review of Wolfram's *A New Kind of Science* (5-7 min.)
- Mid-Point Review
 - Focus on “Emerging Themes” (15-20 min.)
 - Preview of the ESD Faculty Presentation (7-10 min.)
 - Uncertainty, Complexity, Fragility, and Robustness Exercise (30-45 min.)
- An “Engineering Systems” View of “Systems Engineering” and “Systems Architecture” , C. L. Magee, (20-30 min.)
- Break (10 min.)
- Book Review:
 - Galbraith on *Organizational Design* – Review by Jeroen Struben (5-7 min.)
- Socio-Technical Systems, Joel Cutcher-Gershenfeld (30-45 min.)
- Concluding Observations – Thomas Hughes (15-20 min.)
- Next Steps (10-15 min.)



Uncertainty, Complexity, Fragility, and Robustness

- Step 1:
 - Form four groups – focusing on “uncertainty,” “complexity,” “fragility,” and “robustness” respectively
- Step 2:
 - Brainstorm different metrics and methods for assessing different degrees of your assigned concept
- Step 3:
 - Assess the list – here are sample assessment questions:
 - Are the metrics and methods idiosyncratic to specific systems?
 - Are the metrics and methods easy or difficult to apply?
 - Where are these methods and metrics used and where could they be used?
- Step 4:
 - Be prepared to report out our findings for full group discussion