

**ROLLINS COLLEGE**  
**DEPARTMENT OF ECONOMICS**

**Course:** ECO 205I – Economics in Motion

**Term:** Intersession 2006, M, T, W, R, F 9:00 am- 1:00 pm, CSS 221

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### **COURSE DESCRIPTION**

This course provides an introduction to a non-mainstream approach to the study of economic processes as time-evolving systems. In doing so it provides a comparison of the new approach with the classic approach predicated on the demand and supply equilibrium principle. Factors essential to the evolution of economic systems such as cause, effect, transition, positive and negative feedback, critical points and emergent properties characteristic of complex systems will be identified in examples and discussed in class.

### **COURSE OBJECTIVES**

- ❑ To help students understand and be able to explain the difference between neoclassical and heterodox (non-mainstream) economics.
- ❑ To help students understand and be able to explain the essential factors to the evolution of economic systems such as cause, effect, transition, positive and negative feedback, critical points and emergent properties characteristic of complex systems.
- ❑ To introduce students to a set of tools for studying an economic process in motion. These tools are: cobweb diagrams for equilibrium problems, analytic modeling of time evolving processes, and agent-based simulations.

### **COURSE MATERIALS**

Since this is a unique course never before offered at Rollins College there is no ONE textbook to be used. Handouts provided by the instructor will constitute reading material for students.

I suggest that students acquire a notebook for class assignments and handouts distributed by the instructor.

### **COURSE INVOLVEMENT**

Students are expected and encouraged to actively engage in class discussion.

### **HOMEWORK**

Homework questions will be assigned daily. There will be a quiz at the beginning of each class based on the previous day discussion and depending on the homework assigned. Your final grade (Pass/Fail) will be determined by your involvement in the course, homework completion and grades on quizzes.

## Tentative Course Schedule

### Day 1:

- Mainstream versus heterodox economics.
- The mainstream approach and its drawbacks to studying economics:
  - Time and causality insufficiently emphasized
  - Criticism of the 'instantaneous' equilibrium principle
  - Solutions in the literature
- Economics as a dynamic system:
  - Causality and feedback, examples;
- Short introduction to Excel as a tool for studying time-series
- HW1: Examples of negative and positive feedback in economics.

### Day 2:

- Introduction to model-based simulation
  - The bagel production model
    - Classic, equilibrium-based approach
    - Cobweb diagram to show how reaching the equilibrium may happen in a number of iterations and not instantaneously. Alternatively using a Cobweb diagram to show that moving away from equilibrium is possible and depends on the relative elasticities of demand vs. supply
    - Deriving a time-evolving model, interactively:
      - Establish the descriptors: Price, Q. demanded, Q. supplied, Q.sold, Revenue.
      - Determine the causal relations between descriptors
      - Derive equations based on these relations
      - Simulate in Excel the evolution in time of the bagel production system based on the equations derived above
- HW2: Identify a real-life problem that lends itself to model-based simulation and propose a model for it.

### Day 3:

- Introduction to another approach to modeling: extracting models from numeric data:
  - Regression based techniques;
    - Examples: Gravity Trade Models.
    - Nonlinear regression based on genetic programming tools (Dynamo).
    - Present a linear regression exercise in Excel.
- HW3: Build your own set of data and generate a regression in Excel based on your particular data set.

#### Day 4:

- Peered review and class discussion of selected models designed by students in HW2.
- Completion of the analytic modeling section of the course:
  - Discuss issues such as data insufficiency, overtraining in nonlinear models.
- Start introduction to agent-based simulation. Define a problem (such as the happiness problem: “Suppose we build an artificial society and define the happiness function of an individual which is equal to a linear combination of income, leisure time, and the happiness of his neighbors. Each individual will select the amount of work time, the amount of leisure time, and the amount of money to donate to its neighbors in order to increase their happiness function, and, consequently, his own. How would that society evolve? Would it turn into a communist type of society where everybody works to the maximum of its abilities and consumes only what they need? Suppose we introduce a Government, which imposes the taxes (donations to neighbors) itself, in order to maximize a global happiness function, instead of each individual trying to maximize his own. What difference would we notice in the evolution of our artificial society?”
- Guest speaker: Professor Kypraios, Economics Department, Rollins College.

#### Day 5:

- Conclusion of the agent-based simulation section.
  - Simulate the happiness model in NetLogo.

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Note: This syllabus may be changed at the discretion of the instructor should circumstances make such change needed. The instructor or his representative will announce any changes beforehand in class.