

## **Empirical Implications of Theoretical Models (EITM) 2008**

**Instructors:** Jim Granato and M.C. Sunny Wong

**Date:** August 4 — 15 (two week course / 35 hrs)

**Time:** 2:15pm – 5:45pm

**Course Content:** One purpose of scientific inquiry is to use a set of plausible facts or axioms, model them in a rigorous mathematical manner, and identify causal relations that explain empirical regularities. With this in mind, the purpose of this course is to demonstrate how to merge formal and empirical analysis; that is, to examine the empirical implications of theoretical models (EITM). A function of EITM is to ensure that one meets the minimal requirement that a theory and its test are related.

**Course Objectives:** This course will demonstrate several ways to do EITM research. Examples will relate social, behavioral, and economic (SBE) concepts (expectations, learning, and social interaction) to applied statistical concepts (persistence, measurement error, and simultaneity). Students will be introduced to the various techniques and devices (analogues) for both SBE and applied statistical concepts, and how they can be linked.

**Course Instruction:** Course instruction involves the use of modules. Each module is self contained. Each teaching module is conducted in four stages.

*Stage 1:* The article/chapter(s) are reviewed and their formal and statistical concepts and analogues are identified.

*Stage 2:* Students are given exercises to develop a basic understanding in the use of the identified formal/statistical concepts and analogues.

*Stage 3:* Students are instructed on the linkage between the formal/statistical concepts and analogues.

*Stage 4:* With *stages 1-3* complete, students “lecture” the instructors on the example article/chapter(s) introduced in the module.

**Course Prerequisites and Tools Used:** In the social sciences, the unification of formal and empirical analysis is at an early intellectual stage. We will use articles and book chapters (from various disciplines) that assist in developing approaches that unify formal and empirical analysis. The expectation is that students will develop and use these tools --- and this way of thinking --- to investigate their specific substantive questions. These tasks require that participants have a working familiarity with introductory econometrics, algebra, matrix algebra, and calculus. This background allows students to apply the following analytical and statistical tools:

- Stationary Time-Series Models and Persistence
- Elements of Game Theory and Decision Theory
- Multi-equation Time-Series Models and Simultaneity
- Cointegration and Error-Correction Models
- Error-in-Variables Regression
- Discrete Variable Analysis
- Elements of Bayesian Analysis
- Conditional Expectations Modeling and the Rational Expectations Hypothesis
- Adaptive Learning: Expectational Stability Conditions

## Overview: The Scientific Justification for EITM

### Reading (#: Required Reading):

- Achen, Christopher. 2002. An Agenda for the New Political Methodology: Microfoundations and ART. *Annual Review of Political Science* 5: 423-450.
- #Achen, Christopher. 2005. Let's Put Garbage-Can Regressions and Garbage-Can Probits Where They Belong. *Conflict Management and Peace Science* 22: 327-339.
- #Bamber, Donald. 2000. How to Assess a Model's Testability and Identifiability. *Journal of Mathematical Psychology* 44: 20-40.
- #Christ, Carl. 1994. The Cowles Commission's Contributions to Econometrics at Chicago, 1939-1955. *Journal of Economic Literature* 32, 1: 30-59.
- #Granato, Jim., and Frank Scioli. 2004. Puzzles, Proverbs, and Omega Matrices: The Scientific and Social Significance of Empirical Implications of Theoretical Models (EITM). *Perspectives on Politics* 2: 313-323.
- #Heckman, James. 2000. Causal Parameters and Policy Analysis in Economics: A Twentieth Century Retrospective. *Quarterly Journal of Economics* 115: 45-97.
- #Jasso, Guillermina. 2004. The Tripartite Structure of Social Science Analysis. *Sociological Theory* 22: 401-431.
- Mizon, Grayham. 1995. A Simple Message to Autocorrelation Correctors: Don't. *Journal of Econometrics* 69: 267-288.
- Naylor, Thomas., Terry Seaks, and D. W. Wichern. 1972. Box-Jenkins Methods: An Alternative to Econometric Models. *International Statistical Review* 40, 2: 123-137.

## Module 1: Relating Intuition to Formalization with Applications to Social Science Questions

### EITM Linkage: Concept Linkage to Measurable Analogues

### Reading (#: Required Reading):

- #Converse, Philip. 1969. Of Time and Partisan Stability. *Comparative Political Studies* 2 (July): 139-171.
- #Friedman, Milton. 1968. The Role of Monetary Policy. *American Economic Review* 58: 1-17.
- #Jasso, Guillermina. 2006. Theoretical Unification in Justice and Beyond. Typescript.
- #Key, V. O., Jr. 1955. A Theory of Critical Elections. *Journal of Politics* 17, 1: 3-18.

## **Module 2: Economic Voting and Economic Outcomes**

### **EITM Linkage: Expectations/Signal-Extraction (Measurement Error) and Error-in-Variables Regression**

#### Reading (#: Required Reading):

- #Alesina, Alberto., and Howard Rosenthal. 1995. *Partisan Politics, Divided Government, and the Economy*. Cambridge University Press (Chapter 8).
- #Kramer, Gerald. 1983. The Ecological Fallacy Revisited: Aggregate Versus Individual-Level Findings on Economics and Elections and Sociotropic Voting. *American Political Science Review* 77: 92-111.
- #Lucas, Robert E, Jr. 1973. Some International Evidence on Output-Inflation Tradeoffs. *American Economic Review* 63: 326-34.
- #Suzuki, Motoshi., and Henry Chappell, Jr. 1996. The Rationality of Economic Voting Revisited. *The Journal of Politics* 58, 1: 224-236.

## **Module 3: Public Opinion and Economic Policy**

### **EITM Linkage: Expectations and Persistence**

#### Reading (#: Required Reading):

- #Clarke, Harold., and Jim Granato. 2004. Autocorrelation: From Practice to Theory. In K. Kampf-Leonard (ed.), *Encyclopedia of Social Measurement*. San Diego: Academic Press.
- #Granato, Jim, and M.C. Sunny Wong. 2006. *The Role of Policymakers in Business Cycle Fluctuations*. New York: Cambridge University Press (Chapter 7).

## **Module 4: Information Processing and Information Sharing**

### **EITM Linkage: Social Interaction, Learning, and Simultaneity**

#### Reading (#: Required Reading):

- #Granato, Jim, Melody Lo, and M.C. Sunny Wong. 2006. The Diffusion of Inflation Expectations: Theory and Evidence. Typescript.

## **Module 5: The Decision to Participate in Public/Political Processes**

### **EITM Linkage: Learning and Discrete Outcomes**

#### Reading (#: Required Reading):

- #Achen, Christopher. 2006. Expressive Bayesian Voters, their Turnout Decisions, and Double Probit: Empirical Implications of a Theoretical Model. Typescript.

## **Module 6: International Conflict and Cooperation**

### **EITM Linkage: Game Theory/Strategic Interaction and Discrete Outcomes**

#### Reading (#: Required Reading):

- #Signorino, Curtis. 1999. Strategic Interaction and the Statistical Analysis of International Conflict. *American Political Science Review* 93, 2: 279-297.

## **Module 7: Choice under Uncertainty**

### **EITM Linkage: Decision Theory/Utility Maximization and Discrete Outcomes**

#### Reading (#: Required Reading):

- #Kedar, Orit. 2005. When Moderate Voters Prefer Extreme Parties: Policy Balancing in Parliamentary Elections. *American Political Science Review* 99, 2: 185-199.

### **Selected Supplemental Technical Reading**

- Enders, Walter. 2004. *Applied Econometric Time Series*. 2<sup>nd</sup> ed. New Jersey : John Wiley & Sons (Chapters 1, 2, 5, and 6).
- Evans, George., and Seppo Honkapohja. 2001a. Economics of Expectations. *International Encyclopedia of the Social and Behavioral Sciences*.
- Evans, George, and Seppo Honkapohja. 2001b. *Learning and Expectations in Macroeconomics*. Princeton, NJ: Princeton University Press (Chapters 1, 2, 3).
- Iversen, Gudmund. 1984. *Bayesian Statistical Inference*. Beverly Hills and London: Sage Publications.
- Johnston, Jack., and John DiNardo. 1997. *Econometric Methods*. 4<sup>th</sup> ed. New York: McGraw Hill (Chapters 5, 6, 7, 8, 9, and 13).
- Morton, Rebecca. 1999. *Methods and Models: A Guide to the Empirical Analysis of Formal Models in Political Science*. New York: Cambridge University Press.

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