

**APPLIED ECONOMIC MODELING
YEREVAN, ARMENIA
APRIL/MAY 2010**

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**Organized by:
Ministry of Economy**

**With Support From:
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**Dates:
April 28 – May 7, 2010**

COURSE DESCRIPTION

Applied Economic Modeling is an *introductory* 6-day course designed to introduce the fundamental concepts, practices, and implementations of Computable General Equilibrium (CGE) modelling. The course will review the underlying economic theory for general equilibrium, provide examples of CGE applications to various government policy situations, and review basic CGE model examples.

During the course, participants will be introduced to software used for applied economic modeling and for presenting economic results. Several small examples, or “maquettes” will be used as exercises in order to provide “hands-on” experience with CGE modelling.

Near the end of the course, more sophisticated theories and models will be presented, and full-scale CGE models will be constructed from local, Armenian datasets. Popular taxation and international trade models using large modelling datasets will be provided for exploration, this includes elements of the GTAP dataset. Course materials, including presentations, software, readings, and assignments will either be posted to a shared website, or will be distributed in class using flash-memory or paper.

COURSE DETAILS:

Schedule:

Fri, Mon, Tue, Wed, Thurs: 9:30am – 12:00pm (Lectures & Coursework)
Monday - Friday: 1:00pm – 3:00pm (Computer Labs)
Friday: 10:00am – 12:00pm (Individual Cases)

Workload:

There will be 2 or 3 homework assignments.

There will be 2 quizzes

The last homework assignment will be a “large” economic analysis and reporting task.

Plan to spend 60-150 minutes daily, 6 days per week, on coursework outside of the classroom.

The assignments and testing are a useful means to gain feedback from the participants to the instructor. The assignments are also an integral part of learning, especially because modeling itself is a “hands-on” activity, that cannot be learned passively.

Primary Reading Materials:

- MPSGE Users’ Guide : Chapters 1 and 2. (30 pages)
- GAMS Users’ Guide: Chapter 2 - Tutorial
- Varian, *Microeconomic Analysis*, 3rd Ed.

Additional Reading: (will be amended):

- Social Accounting Matrices (One for Armenia, and One General)
- Introduction to National Accounts

ECONOMIC FUNDAMENTALS:

Importantly, this is a course in *economics*. Practitioners of any type of modeling must first have a clear understanding of the basic economic principles underlying consumer choice, firm optimization, and markets. The economic fundamentals portion of the course is a review of microeconomic theory, general equilibrium theory, functional forms, and some more specific economic concepts related to taxation, international trade, and economic growth.

Topics in Economic Fundamentals:

Introduction to Production and Demand Functions

Functional Forms

Economic Optimization for Consumers and Producers

Market Equilibrium

COMPUTER FUNDAMENTALS:

A major hurdle to modeling is the ability to effectively use a computer and computer software. Modeling is akin to computer programming, which requires the ability to locate and open various text and data files quickly and efficiently, to edit long computer programs (text files), to submit data and computer code to the computer processor, and to organize and output clear, coherent analysis of the results.

Topics in Computational Fundamentals:

File management in a Windows environment

Text files and text editors

The DOS command window and batch files

GAMS and GAMS-IDE

GAMS and MS Office

MATHEMATICAL OPTIMIZATION:

General Equilibrium is an exercise in *optimization*. Consumers and firms are considered to be *optimizing agents* in an economy. This course will review the standard mathematical tools for optimization, theoretically and computationally.

Topics in Mathematical Optimization:

Un-constrained optimization

Constrained Optimization

Classes of Optimization Problems: LP, NLP, MCP

Optimization and GAMS

PUBLIC FINANCE: THEORY AND PRACTICE

Most Taxation and public spending are the primary tools used by the Jamaican government to resolve *market failures*. During the course, we will review some of the standard economic thought regarding tax policy, and public welfare. Most of this analysis will be viewed through the lens of a general equilibrium model.

Topics in Public Finance:

Measurement of Public Welfare: Equivalent or Compensating Variation

Tax and Economic Efficiency: Ramsey rule and others.

Taxation and the supply of public goods: Samuelson's Rule

Taxes with Imperfect Administration and Exceptions

CGE ANALYSIS: THEORY AND PRACTICE

CGE modeling will be used throughout the course as the lens for viewing economic policy. The practice of constructing a CGE model, however, is not obvious. This component will provide a “step-by-step” guide how to organize economic data and how to construct CGE models for policy analysis.

Topics in CGE Analysis:

Data-Management and Social Accounting

Data Entry and Organization within GAMS / MPSGE

MPSGE Syntax and Modeling

Counterfactual Analysis using GAMS / MPSGE

Sensitivity Analysis

Results: Organization, Interpretation, and Reporting