The Master of Science in Quantitative Economics

The Master of Science in Quantitative Economics program emphasizes the development of applied economics concepts, theory, and applications. Program entrants can matriculate as one-year, full-time, in-residence students, or as part-time students who work during the day. The program is flexible enough to be done over three years allowing working professionals the opportunity to increase their human capital while maintaining their careers. All classes occur during the evening. Program entry points are in late August (Fall Term) or early June (Summer Term). The priority application deadline is 45 days prior to start of one of the program entry terms.

The goal of the program is to create a professional economist. This is a person who can speak and write the language of economics, is able to manipulate economic models, collect the relevant data to conduct empirical studies, and is proficient at communicating the results of their analysis to other economists as well as to the general public. While these should be the goals of any master's level program in economics, our program goes farther. We add a forecasting component: graduates will be able to design economic forecast models, program them on a computer, and present the results to a public audience.

Full-time students are potentially eligible to work at CLU's Economic Research and Forecast Center (CERF) where they work alongside supervising faculty and have the opportunity to participate in economic analysis.

M.S. Quantitative Economics program graduates will be well prepared to accept jobs in the economics, banking, corporate finance, public finance, money management, forecasting, marketing, and real estate fields. They will be particularly strong in financial analysis and risk management, data analysis and empirical computations including model design, database design, statistical estimation, and forecasting.

Key Program Components

Knowledge of economic theory guides applied economic data analysis. It allows the researcher to ask the appropriate questions. The program includes extensive theoretical training in microeconomics, macroeconomics, environmental economics, and in financial economics.

Applied economic data analysis requires extensive knowledge of economic data, statistical/econometric training, and familiarity with a moderate level of computer programming. The program includes a four-course sequence dedicated to econometrics, data, and computer software. Each course builds on the previous course(s). By the end of the program, the student can write a computer program that builds an economic forecast model and computes the forecast. Completing such a task requires the joint integration of economic theory, statistics/econometrics, data knowledge, and computer programming that makes most other empirical projects seem easy by comparison.

Admission Requirements

1. Bachelor's degree with demonstrated quantitative ability
    a. Calculus: One course required; one year recommended
    b. Statistics: One course required; one year recommended
    c. Econometrics: One course highly recommended
    d. Computer Programming: Some familiarity and a willingness to learn required
2. Grade Point Average (GPA) of 3.0 or higher (or equivalent)
3. GRE of 1000 or GMAT of 500[1]
4. Two letters of recommendation
5. Statement of Purpose
6. International applicants must provide evidence of English language proficiency
    a. TOEFL of 570/230/89; or
    b. IELTS 6.5; or
    c. Successful completion of the highest level of an English language program recognized by CLU
7. Work experience preferred but not required

[1]   GRE/GMAT may be waived, depending upon candidate's academic background.

Requirements for the Master of Science in Quantitative Economics

The curriculum includes a total of 12 graduate courses (36 credits). All courses are offered in 11-week terms.

Required Courses

(36 Credits)

ECON 510	Econometrics 1	3
ECON 511	Econometrics 2	3

ECON 512	Econometrics 3	3
ECON 513	Economic Modeling	3
ECON 520	Microeconomic Theory - Part 1	3
ECON 521	Microeconomic Theory - Part 2	3
ECON 530	Macroeconomic Theory - Part 1	3
ECON 531	Macroeconomic Theory - Part 2	3
ECON 543	Financial Economics - Part I	3
ECON 544	Financial Economics - Part II	3
ECON 545	,Financial Economics - Part III	3
ECON 555	Economics and Environmental Policy	3
Total Hours		36

Courses

ECON 500. Operations Research. (3).
Operations Research will focus on linear programming and game theory. The theory behind linear programming will be revealed and a large variety of practical examples will be presented. Students will use the technique to solve practical problems on their own using computers at labs on campus. We will generalize the method to include non-linear programming, again with practical examples. Then we will study game theory. Game theory is one of the primary tools economists use to study strategic choices. One of many examples is pricing and entry behavior in oligopolistic markets. Finally we will relate game theory with linear programming as it is the case that certain types of games can be solved using linear programming. This is a tools class and no project will be required. Students will have extensive problem sets.

ECON 510. Econometrics 1. (3).
The first econometrics course will provide a thorough review of the classical regression model. Some instruction will occur in the computer lab, where students will be instructed how to run regressions using actual data. Problem sets and a practical regression-based project will be assigned to each student.

ECON 511. Econometrics 2. (3).
This class will build on the classical regression model. Students will learn cross-sectional and panel techniques. The use of instrumental and dummy variables will be discussed. Problem sets and a practical regression-based group project will be required.

ECON 512. Econometrics 3. (3).
The third econometrics course will emphasize time-series methods. We will begin with the serial correlation violation of the classical model. Then we will turn our attention to univariate and multivariate times-series econometrics. Students will spend time in the computer lab where they will apply the techniques they learn to the data. They will complete problem sets and complete a project using time-series econometric methods.

ECON 513. Economic Modeling. (3).
The modeling class will be a very practical hands-on class where the end goal is familiarity with constructing models of economic activity. This course will take place in the computer lab. We start with study of important data distinctions. Students will have access to the Center for Economic Research and Forecasting (CERF) database system. Forecast theory will be studied, including concepts such as model specification and forecast errors. Study of the modeling environment will include the model object, model structure, and practical forecasting considerations. Students will be assigned problem sets and a modeling project.

ECON 520. Microeconomic Theory - Part 1. (3).
This course introduces students to microeconomics, the study of allocating limited resources. The theories economists use to describe economic behavior will be extensively studied. The class will have two sections: Consumer Theory and Production Theory. Because microeconomics is a math intensive course students will be expected to know calculus. This is a tools class and no project will be required. Students will have extensive problem sets.

ECON 521. Microeconomic Theory - Part 2. (3).
This course is a continuation of microeconomics I. The purpose of the course is to combine consumer and producer theory into a general equilibrium framework. This course will study theories that analyze consumers and producers in a market economy.

ECON 530. Macroeconomic Theory - Part 1. (3).
This course will establish the core macroeconomic theoretical foundation for the program. It will include study of the traditional static Keynesian model. The remainder of the course will be spent on the infinite horizon representative agent model. Using this model, we will study fiscal policy. Policy implications for the various models will be a key part of the course. Class participation, problem sets, and a project will be required. Prerequisite: ECON 521.

ECON 531. Macroeconomic Theory - Part 2. (3).
This class continues the macroeconomic theory curriculum that was begun in Economics 530. The course will study monetary theory and policy, and current policy topics. The monetary theory and policy portion of the course will consist of the study of: money supply, money demand, interest rate theories, the costs and benefits of sound money policies, the theory of monetary policy, transmission mechanisms, and monetary policy strategies. Then the course will delve into current economic policy topics, where the topic may change over time. Students will be expected to participate in class discussions. The course will include a project.

ECON 542. Operations Research. (3).
Operations Research will focus on linear programming and game theory. The theory behind linear programming will be revealed and a large variety of practical examples will be presented. Students will use the technique to solve practical problems on their own using computers at labs on campus. We will generalize the method to include non-linear programming, again with practical examples. Then we will study game theory. Game theory is one of the primary tools economists use to study strategic choices. One of many examples is pricing and entry behavior in oligopolistic markets. Finally, we will relate game theory with linear programming as it is the case that certain types of games can be solved using linear programming. This is a tools class and no project will be required. Students will have extensive problem sets.

ECON 543. Financial Economics - Part I. (3).
This course is an introduction to and study of the theory and practice of financial economics and financial engineering. Topics include an overview of financial markets and instruments, mechanics of derivative contracts, fundamentals of interest rates and discounting, principles of valuation, and applications to hedging and risk management.

ECON 544. Financial Economics - Part II. (3).
This course is the second course on financial economics. Topics include the theory of derivatives valuation, numerical techniques used to value derivatives and implement hedging programs, interest rate modeling, market risk management, and Value at Risk.

ECON 545. Financial Economics - Part III. (3).
This course is the third course on financial economics. Topics include credit risk managment, risk management at financial institutions, bank capital requirements, and applications and opportunities for financial engineers. Students will be expected to design and implement a risk management program or financial engineering application.

ECON 555. Economics and Environmental Policy. (3).
The goal of this course is to provide extension and empirical application of microeconomic and econometric theories already studied in the MSQE program. The class will focus on the theory of public bads/externalities, regulation theory and empirical analysis in the context of environmental problems. We will examine when markets maximize net benefits to society and under what conditions they fail to do so. Market failures that we will discuss include public goods, externalities, and common pool problems. We will study non-market valuation of environmental goods and a few important econometric tools that are used to conduct policy analysis. The last part of the class will focus on the design of environmental policies to improve the performance markets. In addition to completing problem sets and 2 exams, each student will be responsible for 3-4 policy briefs, each of which involves writing and presenting economic analysis of specific environmental policies. Prerequisites: ECON-520 and ECON-521.

ECON 590. Independent Study. (1-4).