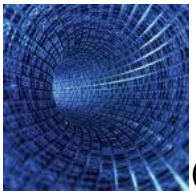

Certificate in Quantitative Economics *revised June 2016*

The Certificate in Quantitative Economics (CQE) is awarded to students who complete the demanding course requirements in economics, statistics, mathematics, and computer science. It is open to students in any major, but will be most readily completed by those majoring in economics with a minor or double major in mathematics, statistics, computer science, or mathematical statistics.

Students who have completed the CQE have some of the background necessary for graduate programs in economics, statistics, business administration, finance, and quantitative finance, among others, as well as for positions in consulting, investment banking, actuarial science, financial operations and more.

The certificate is awarded at the end of the spring semester for graduating students, and is noted on the student's transcript. Students may also include their participation in the CQE on their resumes.

REQUIREMENTS
Students wishing to pursue the certificate must have at least a 3.0 overall gpa and must maintain a 3.0 average in the courses required for the certificate. Students should complete the online **application form** when starting the certificate and meet with the CQE advisor. In their last semester at Rutgers, they will meet with the advisor to certify completion of all requirements.

Note that many of the required courses have prerequisites and thus the program should be started early and students must plan their schedules carefully to satisfy all requirements.

Equivalent transfer courses for any of the requirements, accepted by the appropriate department, will be accepted for the CQE.

The CQE advisor can, in well-justified circumstance, allow substitution of comparable courses for up to two of the required courses noted below.

REQUIRED COURSES in economics, mathematics, statistics, and computer science

ECONOMICS (220) – 6 COURSES
All four of the following:
102 Introduction to Microeconomics
103 Introduction to Macroeconomics
320 Intermediate Microeconomics
322 Econometrics

*(Intermediate Macroeconomics (220:321)is not a requirement for the CQE, but it is a prerequisite for some of the economics courses a student might wish to take for the CQE. These courses are marked below with an *)*

Two courses from the following. *It is recommended, but not required, that at least one be 400, 401, or 421*
400 Advanced Time Series and Financial Econometrics*
401 Advanced Cross-sectional and Panel Econometrics*
405 Economics of Uncertainty
406 Game Theory
407 Economics of Information
421 Economic Forecasting and Big Data*
640:485 Introduction to Mathematical Finance
**Indicates that the course requires Intermediate Macroeconomics (220:32)1 as a prerequisite*

MATHEMATICS (640) – 4 COURSES
151,152 Calculus for Mathematical and Physical Sciences OR 191,192 Honors Calculus or equivalent;
Note: 135 will be accepted in place of 151 but 640:136 does not satisfy the prerequisites for the following courses.
250 Linear Algebra
251 Multivariable Calculus
(or 291 Honors Multivariable Calculus)

STATISTICS (960 or 640) – 4 COURSES
Both of the following: 960:381 Theory of Probability and 960:382 Theory of Statistics
NOTES: Mathematical Theory of Probability (640:477) and Theory of Statistics (640:481) can substitute for 381, 382– students considering a major or minor in math should normally take these courses.

The two course sequence (960:381-382 or 640:477,481) can substitute for the economics statistics requirement (285)

One of the following: 960:384 Intermediate Statistical Analysis **OR** 960:484 Basic Applied Statistics (cannot take both 384 and 484) **OR** 960:467 Applied Multivariate Analysis

One of the following: 960:390 Introductory Computing for Statistics **OR** 960:486 Computing and Graphics in Applied Statistics (note 390 is a 1.5 credit 5 week course, 486 a 3 credit 14 week course)

COMPUTER SCIENCE (198) – 2 COURSES
2 of the following
110 Introduction to Computers and Their Application **OR** 170 Computer Application for Business
111 Introduction to Computer Science
112 Data Structures
*(111 and 112 recommended, but 110 and 111 **or** 170 and 111 acceptable - cannot take both 110 and 170):*