ECONOMICS AND COMPUTER SCIENCE (BA)

Department Website (http://cs.nyu.edu/)

NYSED: 21611 **HEGIS:** 0799.00 **CIP:** 11.0199

Program Description

This is an interdisciplinary major offered by the Department of Economics with the Department of Computer Science. This joint major is intended for the student who seeks comprehensive training in economic analysis alongside computing and programming techniques. It is particularly well-suited for students who wish to better understand the digital economy and are interested in pursuing an academic or professional career at the intersection of these two disciplines. Students pursuing this joint major will follow the Theory track in Economics.

Joint Honors

Honors students are required to take twenty-three to twenty-four 4-credit courses (92-96 credits). A 3.65 overall GPA and a 3.65 average in both economics and computer science courses are required. Honors students must follow the Theory concentration in Economics, participate in a year-long research program in their senior year, and write a thesis under faculty supervision. Interested students must consult with the directors of undergraduate studies in both departments for advisement and for permission to enter the honors program.

Course	Title	Credits
Joint Honors Requirements		
Economics		
ECON-UA 1	Introduction to Macroeconomics	4
ECON-UA 2	Introduction to Microeconomics	4
ECON-UA 11	Microeconomic Analysis	4
ECON-UA 13	Macroeconomic Analysis	4
ECON-UA 266	Intro to Econometrics	4
ECON-UA 20	Analytical Statistics	4
or MATH-UA 334	Mathematical Statistics	
Two theory advanced economics elective courses [1]		8
ECON-UA 410	Honors Tutorial (taken fall of Senior year)	4
ECON-UA 450	Honors Thesis I (taken in the spring of Senior year)	4
Computer Science		
CSCI-UA 101	Intro to Computer Science	4
CSCI-UA 102	Data Structures	4
CSCI-UA 201	Computer Systems Org	4
CSCI-UA 202	Operating Systems	4
CSCI-UA 310	Basic Algorithms	4
CSCI-UA 421	Numerical Computing	4
CSCI-UA 453	Theory of Computation	4
Three advanced computer science electives [2]		8-12
Mathematics		
MATH-UA 120	Discrete Mathematics	4
MATH-UA 131	Mathematics for Economics I	4
MATH-UA 132	Mathematics for Economics II	4
MATH-UA 133	Mathematics for Economics III	4
Total Credits		**92-96**

1. Courses must be numbered ECON-UA 300-399.
2. Courses must be numbered CSCI-UA 400-499. One advanced computer science elective may be substituted by MATH-UA 140 Linear Algebra, ECON-UA 310 Game Theory (T) or ECON-UA 365 Advanced Micro Theory (T). Students may double-count one economics elective towards the computer science elective, but not the reverse.

Admissions

New York University's Office of Undergraduate Admissions supports the application process for all undergraduate programs at NYU. For additional information about undergraduate admissions, including application requirements, see How to Apply (https://www.nyu.edu/admissions/undergraduate-admissions/how-to-apply.html).

Program Requirements

The major in Economics and Computer Science requires 22 courses (88 credits): nine courses each in economics and computer science and four in mathematics, all completed with a grade of C or better. This program is suited for well-prepared students who have earned Advanced Placement (or equivalent) credit in at least one of the following subjects: Computer Science A (equivalent to CSCI-UA 101); Macroeconomics (equivalent to ECON-UA 1); or Microeconomics (equivalent to ECON-UA 2). Students without any advanced standing credit must take 132 credits (instead of the minimum 128) to complete the baccalaureate degree and should discuss either a) one summer course at NYU or b) a major in one of these fields and a minor in the other with a departmental or CAS adviser.

Course	Title	Credits
General Education Requirements		
First-Year Seminar		4
EXPOS-UA 1	Writing as Inquiry	4
Foreign Language [1]		16
Physical Science		4
Life Science		4
Texts and Ideas		4
Cultures and Contexts		4
Expressive Culture		4
Major Requirements		
Economics Requirements		
ECON-UA 1	Introduction to Macroeconomics	4
ECON-UA 2	Introduction to Microeconomics	4
ECON-UA 11	Microeconomic Analysis	4
ECON-UA 13	Macroeconomic Analysis	4
Select one of the following:		4
ECON-UA 20	Analytical Statistics	
MATH-UA 334	Mathematical Statistics [2]	
ECON-UA 266	Intro to Econometrics	
Select two ECON-UA theory electives at the 300 level		8
Select one additional ECON-UA elective		4
Computer Science Requirements		
CSCI-UA 101	Intro to Computer Science	4
CSCI-UA 102	Data Structures	4

CSCI-UA 201	Computer Systems Org	4
CSCI-UA 202	Operating Systems	4
CSCI-UA 310	Basic Algorithms	4
Select four computer science electives at the 400 level [3]		16
Mathematics Requirements		
MATH-UA 120	Discrete Mathematics	4
MATH-UA 131	Mathematics for Economics I	4
MATH-UA 132	Mathematics for Economics II	4
MATH-UA 133	Mathematics for Economics III	4
Total Credits		**128**

1 The foreign language requirement is satisfied upon successful completion through the Intermediate level of a language. This may be accomplished in fewer than 16 credits, but those credits must then be completed as elective credit.

2 Students taking the MATH-UA 334 Mathematical Statistics option must complete one additional ECON-UA elective (two total).

3 One of these electives may be replaced by MATH-UA 140 Linear Algebra or ECON-UA 310 Game Theory (T) or ECON-UA 365 Advanced Micro Theory (T).

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
CSCI-UA 101	Intro to Computer Science	4
MATH-UA 131	Mathematics for Economics I	4
First-Year Seminar		4
Texts and Ideas		4
	Credits	**16**
2nd Semester/Term		
CSCI-UA 102	Data Structures	4
ECON-UA 1 or ECON-UA 2	Introduction to Macroeconomics [1] or Introduction to Microeconomics	4
MATH-UA 132	Mathematics for Economics II	4
EXPOS-UA 1	Writing as Inquiry	4
	Credits	**16**
3rd Semester/Term		
CSCI-UA 201	Computer Systems Org	4
ECON-UA 11	Microeconomic Analysis	4
MATH-UA 133	Mathematics for Economics III	4
Cultures and Contexts		4
	Credits	**16**
4th Semester/Term		
CSCI-UA 202	Operating Systems	4
ECON-UA 13	Macroeconomic Analysis	4
ECON-UA 20	Analytical Statistics	4
MATH-UA 120	Discrete Mathematics	4
	Credits	**16**
5th Semester/Term		
CSCI-UA 310	Basic Algorithms	4
Computer Science Major Elective (400-Level) (#1 of 4) [2]		4
Expressive Culture		4
Foreign Language I		4
	Credits	**16**
6th Semester/Term		
Computer Science Major Elective (400-Level) (#2 of 4)		4
ECON-UA 266	Intro to Econometrics	4
Economics Major Elective (200-Level) (#1 of 1) [3]		4
Foreign Language II		4
	Credits	**16**
7th Semester/Term		
Computer Science Major Elective (400-Level) (#3 of 4)		4
Economics Major Elective (300-Level) (#1 of 2)		4
Physical Science		4
Foreign Language III		4
	Credits	**16**
8th Semester/Term		
Computer Science Major Elective (400-Level) (#4 of 4)		4
Economics Major Elective (300-Level) (#2 of 2)		4
Life Science		4
Foreign Language IV		4
	Credits	**16**
	Total Credits	**128**

1 This assumes a well-prepared student who has earned AP credit for one of these two courses. Students who have not earned AP or equivalent credit for at least one of CSCI-UA 101, ECON-UA 1, or ECON-UA 2 and intend to pursue this major require 132 credits to complete the baccalaureate degree (instead of the minimum 128 credits). Consult the curriculum tab for details.

2 Or MATH-UA 140 Linear Algebra.

3 Or an additional economics elective at the 300 level.

Learning Outcomes

Upon completion of program requirements, students are expected to have acquired:

1. Skills in writing computer programs and designing software systems.
2. An understanding of the foundational algorithms and data structures used in computer software.
3. An understanding of what is going on "under the hood" of computer software in terms of the underlying computer architecture and operating systems.
4. Advanced knowledge of some specific areas of computer science and its applications.
5. Substantial knowledge of microeconomics, macroeconomics, and econometrics in both theory and application.
6. The ability to analyze stylized problems using an economic framework and to extend these skills to the analysis of real-world applications.
7. The skills to use statistical models that enable them to conduct quantitative analyses of a wide variety of economic problems.
8. The ability to read, analyze, and clearly explain the economic theory underlying modern economic research.
9. The skills to construct their own behavioral models for use in economics research.

Policies

Program Policies

Policies Applying to the Major

1. The prerequisite for declaring this major is completion of either CSCI-UA 101 Intro to Computer Science or CSCI-UA 102 Data Structures (depending on placement) with a C or better.
2. Only those students following the theory track in economics are eligible to pursue this joint major.

3. A grade of C or better is necessary in all courses used to fulfill joint major requirements; courses graded Pass/Fail do not count.

Required Coursework in CAS (-UA) for all Majors and Minors in Courant

At least half of the courses applied to the Courant requirements of the CAS majors and minors in Computer Science and in Mathematics (including joint programs) must be CSCI-UA and MATH-UA courses taken in New York or at NYU study away sites. This is a built-in limit on how many courses students may take in these subjects that are (for example) sponsored by NYU Abu Dhabi and NYU Shanghai under CS-UH, MATH-UH, CENG-SHU, CSCI-SHU, and MATH-SHU. Internal and external transfers must pay close attention to this policy, but it also applies to students who matriculate as first-years. The usual CAS policies on -UA residency for the baccalaureate degree still apply.

School of Engineering Courses

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CAS students (in any major or minor) are not permitted to take
 computer science courses in the Tandon School of Engineering.
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NYU Policies

University-wide policies can be found on the New York University Policy pages (https://bulletins.nyu.edu/nyu/policies/).

College of Arts and Science Policies

A full list of relevant academic policies can be found on the CAS Academic Policies page (https://bulletins.nyu.edu/undergraduate/arts-science/academic-policies/).