DATA ANALYTICS & QUANTITATIVE ANALYSIS

The specialization in Data Analytics and Quantitative Analysis (DAQA) provides opportunities to pursue advanced work in computational and data analytics, econometrics and quantitative analysis and to apply these techniques to a broad array of policy and management issues.

Contact Us

Cristian Pop-Eleches, Professor of International and Public Affairs
Specialization Co-Director
cp2124@columbia.edu

Alan Yang, Senior Lecturer in the Discipline of International and Public Affairs
Specialization Co-Director
asy2@columbia.edu

Marie Gugnishev
Specialization Coordinator
mg4441@columbia.edu

Cristian Pop-Eleches, Professor of International and Public Affairs; Co-Director of the Data Analytics and Quantitative Analysis Specialization
Alan Yang, Senior Lecturer in the Discipline of International and Public Affairs; Co-Director of the Data Analytics and Quantitative Analysis Specialization

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Douglas Almond, Professor of International and Public Affairs
Flavio Bartmann, Adjunct Professor of International and Public Affairs
Daniel Björkegren, Assistant Professor of International and Public Affairs

Aidan Feldman, Lecturer (part-time) of International and Public Affairs
Poranee 'Pam' Kingpetcharat, Lecturer (part-time) of International and Public Affairs
Rebecca Krisel, Lecturer (part-time) of International and Public Affairs
Emmanuel Letouze, Adjunct Associate Professor of International and Public Affairs
Sameer Maskey, Adjunct Associate Professor of International and Public Affairs
Tamar Mitts, Assistant Professor of International and Public Affairs
Jeffrey Shrader, Assistant Professor of International and Public Affairs
Harold Stolper, Lecturer in Discipline of International and Public Affairs
Douglas Williamson, Adjunct Associate Professor of International and Public Affairs
Mike Zhu, Adjunct Assistant Professor of International and Public Affairs
Visit our SIPA Faculty Directory to view bios

The Data Analytics & Quantitative Analysis (DAQA) Specialization requires 9 points, consisting of one required three-point course, and six-points in either quantitative analysis or data analytics electives.

In addition to these requirements, DAQA students are required to complete the SIPA U6400 / SIPA U6401 sequence of economics in the MIA and MPA core and SIPA U6500 Quantitative Analysis I for International and Public Affairs to qualify for the DAQA Specialization. Additionally, students must earn a minimum grade of **B-** in SIPA U6400 and SIPA U6500. It is strongly recommended that students complete SIPA U6500 during their first semester.

Questions should be directed to Marie Gugnishev, Coordinator of the DAQA Specialization, at mg4441@columbia.edu.

DAQA Pre-Requisites

- SIPA U6400 Microeconomic Analysis for International and Public Affairs*
- SIPA U6401 Macroeconomic Analysis for International and Public Affairs
- SIPA U6500 Quantitative Analysis I for International and Public Affairs*

*Minimum grade requirement of B-

DAQA Requirements

- SIPA U6501 Quantitative Analysis II for International and Public Affairs
- 3 Credits of an Advanced Course
- 3 Credits of elective courses

International Economic Policy Concentration Students

Due to International Economic Policy requiring SIPA U6501 as a core course, students in this concentration must instead take an additional DAQA elective course to fulfill specialization requirements for a total of 9 credits in DAQA electives:

- 3 credits of an Advanced Course
- 6 credits of elective courses

Required Course

		Points
SIPA U6501	Quantitative Analysis II for International and Public Affairs	3.00

Quantitative Analysis Focus Area

		Points
Advanced Courses		
INAF U6599	Quant III: Labor Economics For Policy Students	3.00
INAF U6604	Applied Econometrics	3.00
INAF U6608	Economics of Education Policy	3.00
INAF U6614	Data Analysis for Policy Research Using R	3.00
INAF U8145	Advanced Economic Development for International Affairs	3.00
INAF U8305	Conducting Empirical Research in Economics	3.00
INAF U8360	Economic Measurement of Discrimination	3.00
PEPM U6640	Macroeconometrics	3.00
PUAF U8516	Time Series Analysis	3.00
SIPA U8500	Quantitative Methods in Program Evaluation and Policy Research	3.00
SIPA Electives		
INAF U6016	Cost-Benefit Analysis	3.00

INAF U6098	Financial Risk Management and Public Policy	3.00
INAF U6301	Corporate Finance	3.00
INAF U6326	Renewable Energy Project Finance Modeling	3.00
INAF U6508	Using Big Data to Develop Public Policy	3.00
INAF U6511	Intro to Infographics and Data Visualization	1.50
INAF U6512	Data Driven Approaches for Campaigns and Advocacy	3.00
INAF U6578	Data Collection for Evaluation, Policy, and Management	1.50
INAF U6858	Economics of US Social Policy	1.50
INAF U6889	Impact Measurement # Evaluation for Sustainable Development	3.00
INAF U6891	Impact Evaluations in Practice	1.50
INAF U6892	Monitoring and Evaluation: Driving Evidence-Based Development and Humanitarian Aid	3.00
INAF U8195	Behavioral Development Economics	3.00
Non-SIPA Courses		
Courses offered at affiliate Columbia Schools. Please see Cross-Registration instructions to register. Courses not listed must be approved by the DAQA Director. Enrollment is not guaranteed.		
ACTU K5841	Data Science in Finance and Insurance	3.00
QMSS GR5073Q	Machine Learning for the Social Sciences	3.00

Computational and Data Analysis Focus Area

		Points
Advanced Courses		
INAF U6006	Computing in Context	3.00
INAF U6503	Applying Machine Learning	3.00
INAF U6506	Data Science # Public Policy	3.00
INAF U6514	Text as Data	3.00
INAF U6600	Testing Models of Public Policy Making	3.00
INAF U6614	Data Analysis for Policy Research Using R	3.00
INAF U6659	Advanced Computing for Policy	3.00
PUAF U8516	Time Series Analysis	3.00
SIPA Electives		
INAF U6004	Application Development for Social Impact	1.50
INAF U6005	Generative AI	1.50
INAF U6009	Artificial Intelligence in Public Policy	1.50
INAF U6098	Financial Risk Management and Public Policy	3.00
INAF U6272	Introduction to Data Analytics for Public Policy, Administration, and Management	1.50
INAF U6274	Introduction to Database Design, Management, and Security	1.50
INAF U6275	Geographic Information Systems and Analysis	3.00
INAF U6502	Into to Text Analysis in Python	3.00
INAF U6504	Python for Public Policy	1.50
INAF U6508	Using Big Data to Develop Public Policy	3.00
INAF U6511	Intro to Infographics and Data Visualization	1.50
INAF U6512	Data Driven Approaches for Campaigns and Advocacy	3.00
INAF U6547	Building AI Tools with Large Language Models	1.50
INAF U6548	Artificial Intelligence Institutions	3.00
INAF U6576	Data and Conflict	3.00
INAF U6593	R for Public Policy	1.50
INAF U6892	Monitoring and Evaluation: Driving Evidence-Based Development and Humanitarian Aid	3.00
INAF U6958	Gender Data for Gender Equality	1.50
Non-SIPA Courses		
Courses offered at affiliate Columbia Schools. Please see Cross-Registration instructions to register. Courses not listed must be approved by the DAQA Director. Enrollment is not guaranteed.		
ACTU K5841	Data Science in Finance and Insurance	3.00
QMSS GR5073Q	Machine Learning for the Social Sciences	3.00

Degree Audit Report

Matriculated students in this program can view their degree audit report on Stellic.

For students interested in pursuing careers in data science to develop, implement, and assess public policies in both the public/nonprofit and private sectors, **the Data Science for Policy (DSP) Concentration** provides the opportunity to understand and apply computational and data analytics, econometrics and quantitative analysis to policy related issues.*

The Data Science for Policy (DSP) Concentration requires 15 credits, consisting of one required 3-point course, two courses (or 6 points) of Advanced Courses, and 6 points of electives.

*Please note only students who matriculated in Fall 2024 or later will be allowed to switch to the new concentration curriculum.

Pre-requisites to the DSP Concentration

These prerequisites will be mandatory under the new MPA or quant-focused MIA programs, but current students are expected to have these courses fulfilled in order to concentrate in DSP.

		Points
SIPA U6400	Microeconomic Analysis for International and Public Affairs *	3.00
SIPA U6401	Macroeconomic Analysis for International and Public Affairs	3.00
SIPA U6500	Quantitative Analysis I for International and Public Affairs *	3.00
SIPA U6501	Quantitative Analysis II for International and Public Affairs	3.00

*Minimum grade requirement of B-.

DSP Concentration Requirements

Required Course (3-points)

		Points
INAF U6006	Computing in Context	3.00

Advanced Courses (6-points)

Select at least 6 points of courses to fulfill the requirements. Courses do not have to come from the same focus area, and Advanced Courses can count toward the Elective requirement.

Quantitative Analysis Courses

		Points
INAF U6503	Applying Machine Learning	3.00
INAF U6599	Quant III: Labor Economics For Policy Students	3.00
INAF U6600	Testing Models of Public Policy Making	3.00
INAF U6604	Applied Econometrics	3.00
INAF U6608	Economics of Education Policy	3.00
INAF U6614	Data Analysis for Policy Research Using R	3.00
INAF U8145	Advanced Economic Development for International Affairs	3.00
INAF U8360	Economic Measurement of Discrimination	3.00
SIPA U8500	Quantitative Methods in Program Evaluation and Policy Research	3.00
PUAF U8516	Time Series Analysis	3.00

Data Analysis Courses

		Points
INAF U6503	Applying Machine Learning	3.00
INAF U6506	Data Science # Public Policy	3.00
INAF U6514	Text as Data	3.00
INAF U6600	Testing Models of Public Policy Making	3.00
INAF U6614	Data Analysis for Policy Research Using R	3.00
INAF U6659	Advanced Computing for Policy	3.00

Elective Courses (6-points)

Select at least 6 points of courses to fulfill the requirements. Courses do not have to come from the same focus area

Quantitative Analysis Courses

		Points
INAF U6016	Cost-Benefit Analysis	3.00
INAF U6098	Financial Risk Management and Public Policy	3.00
INAF U6301	Corporate Finance	3.00
INAF U6326	Renewable Energy Project Finance Modeling	3.00
INAF U6508	Using Big Data to Develop Public Policy	3.00
INAF U6511	Intro to Infographics and Data Visualization	1.50
INAF U6512	Data Driven Approaches for Campaigns and Advocacy	3.00
INAF U6858	Economics of US Social Policy	1.50
INAF U6889	Impact Measurement # Evaluation for Sustainable Development	3.00
INAF U6891	Impact Evaluations in Practice	1.50
INAF U6892	Monitoring and Evaluation: Driving Evidence-Based Development and Humanitarian Aid	3.00
INAF U8195	Behavioral Development Economics	3.00

Data Analysis Courses

INAF U6004	Application Development for Social Impact
INAF U6005	Generative AI
INAF U6009	Artificial Intelligence in Public Policy
INAF U6098	Financial Risk Management and Public Policy
INAF U6272	Introduction to Data Analytics for Public Policy, Administration, and Management
INAF U6274	Introduction to Database Design, Management, and Security
INAF U6275	Geographic Information Systems and Analysis
INAF U6502	Into to Text Analysis in Python
INAF U6504	Python for Public Policy
INAF U6508	Using Big Data to Develop Public Policy
INAF U6511	Intro to Infographics and Data Visualization
INAF U6512	Data Driven Approaches for Campaigns and Advocacy
INAF U6547	Building AI Tools with Large Language Models
INAF U6576	Data and Conflict
INAF U6578	Data Collection for Evaluation, Policy, and Management
INAF U6593	R for Public Policy
INAF U6892	Monitoring and Evaluation: Driving Evidence-Based Development and Humanitarian Aid
INAF U6958	Gender Data for Gender Equality

DSP Minor in the New Curriculum

Due to the MPA and quant-focused MIA requiring Quantitative Analysis II for International and Public Affairs (SIPA U6501) as a core course under the new curriculum, current students who switch to the new curriculum and wish to pursue a DSP minor will not be able to count SIPA U6501 for credit. Instead, students must take an additional 3 points of elective course(s) to fulfill specialization requirements for a total of 9 credits to fulfill the DSP minor:

- 3 points of an Advanced Course
- 6 points of elective course

For students switching to the non-quant-focused MIA curriculum, the DSP minor will maintain the same requirements as the current DAQA specialization. (p. 1)