Northeastern University
College of Social Sciences and Humanities

Degree Proposal
Master of Science in Applied Quantitative Methods and Social Analysis
College of Social Sciences and Humanities

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December 15, 2020

Executive Summary

The College of Social Sciences and Humanities (CSSH) charged its Steering Committee on Big Data and Quantitative Methods Initiatives to evaluate the potential for a new master's degree program in the field. Coordinated by Professor Gregory Zimmerman in his role as the College's Director of Big Data and Quantitative Methods Initiatives, the Steering Committee convened through 2020 to discuss the potential of CSSH interdisciplinary curricula in quantitative methods and research to contribute to a new degree program. In collaboration with Associate Dean Thomas Vicino and Enrollment Management, and through discussions with co-op, graduate advising, and partner colleges, the Steering Committee collected data to assess market environment and developed a curriculum. On December 11, 2020, the Steering Committee unanimously recommended the Master of Science in Applied Quantitative Methods and Social Analysis. On December 14, 2020, the CSSH Graduate Academic Advisory Council unanimously approved the degree program. The Associate Dean of Graduate Studies and the Dean of the College enthusiastically support the new degree program.

The proliferation of big data and computational tools has the potential to revolutionize how social scientists explore society, politics, culture, and the economy. CSSH proposes a new Master of Science degree in Applied Quantitative Methods and Social Analysis. This degree program seeks to educate ambitious social scientists and analysts primed to deploy computational tools for social analysis and tackle social science questions of equity, hierarchy, social organization, and social systems. To address big questions in social inquiry, the program provides students with rigorous training in quantitative research, computational tools, and social science methods. In particular, this interdisciplinary degree program draws upon existing methods courses in CSSH as well as electives across the university to provide students with: (1) a broad understanding of quantitative methodologies, computational tools, and analytical strategies in the social sciences; (2) an in-depth understanding of a specialized methodological and analytical technique for social analysis; and (3) an integrated experiential learning opportunity through co-op. The program prepares students to enter the labor force with advanced quantitative skills in social analysis for high-demand, computational and statistical fields.

Specifically, we recommend creating a new, 1-year Master of Science degree program in Applied Quantitative Methods and Social Analysis with a variety of concentrations and the opportunity for experiential learning. The total degree program will require 32 semester hours, or with optional co-op integration 34 semester hours. The program will consist of: (1) a common core of 8 semester hours in statistics and research methods for the social sciences; (2) a required concentration of 12 semester hours; and (3) 12 semester hours of electives. Each concentration will consist of 12 semester hours in following areas: Data Analytics in the Social Sciences; Computational Social Science; Network Analysis in the Social Sciences; Statistical Methods in the Social Sciences; and Information Ethics. Students will have the option of stacking a range of graduate certificate programs into the master's degree. The program's concentrations are aligned to strategic areas of emphasis in CSSH and its interdisciplinary partnerships across the colleges and schools at Northeastern University. Ultimately, the program will uniquely position CSSH to engage with students as well as employers to offer a high-demand, skills-based master's program for the twenty-first century labor force.

Moving forward, the CSSH Steering Committee on Big Data and Quantitative Methods Initiatives will serve as an interdisciplinary body that governs and coordinates the degree program under the direction of the Director.

Program Description

The Master of Science in Applied Quantitative Methods and Social Analysis is an interdisciplinary, flexible, and innovative degree that focuses on quantitative research methods for social analysis strategies and techniques. The program integrates the interdisciplinary perspectives and methodological and analytical tools across the College of Social Sciences and Humanities. The program seeks to educate ambitious social scientists and analysts primed to deploy computational tools for social analysis and tackle social science questions of equity, hierarchy, social organization, and social systems. The 21st century economy will increasingly demand a workforce capable of collecting, processing, analyzing, and interpreting large-scale data on human attributes, personal preferences, social attributes, and political behavior. In response, this program provides students with rigorous training in quantitative research and social science methods to address important questions of social inquiry. Emphasizing public dissemination of findings, the program prepares student to inform policy-makers, decision-makers in the private and public sectors, and the broader community. These skills prepare graduates to pursue analytical or research careers in corporations, non-profits, and public services, or to continue their education.

Students in this degree program will have the opportunity to gain advanced training in statistical analysis and research methodology aligned to key areas of strength in CSSH, including: Data Analytics in the Social Sciences; Computational Social Science; Network Analysis in the Social Sciences; Statistical Methods in the Social Sciences; Information Ethics; Geospatial Analysis; and the Digital Humanities. Students will also have the opportunity to stack a range of graduate certificate programs into the master's degree. These concentrations provide a distinctive competitive advantage for Northeastern University.

The program will take advantage of various co-op opportunities—positions such as policy analysts, network scientists, econometricians, and crime analysts—that provide students a professional environment to integrate quantitative skills and social analysis. The learning opportunities in professional settings (private sector, government, or non-profit sector) reinforce the development of advanced quantitative skills and their applied nature to contemporary social issues. Ultimately, the Master of Science in Applied Quantitative Methods and Social Analysis will position students to enter the labor force with the competitive advantage of these experiences and skills.

Program Contribution to the University's Mission

The proposed master's degree addresses Northeastern University's mission to meet global and societal needs in the social sciences through interdisciplinary and scientific methods and statistics. The proposed degree program is intended to expand our strengths in rigorous methodological and analytical training with theoretical grounding in the social sciences by providing a pathway for educating students for careers that demand a skillset that integrates data analysis and social science frameworks for answering pressing social questions. The program seeks to build on CSSH's commitment to our mission in *Humanics* by providing advanced training and integration of data and technological literacies with human literacies.

To evaluate the market opportunity for the proposed Master of Science in Applied Quantitative Methods and Social Analysis, the following analysis assesses professional and student demand as well as the competitor landscape of programs.

Market Overview

Graduates from the master's degree in Applied Quantitative Methods and Social Analysis will be prepared to pursue in-demand occupations such as Statisticians and Data Scientists. Although these target occupations are shared with other Northeastern master's programs, and precise student demand for related degrees is difficult to quantify given available market indicators, there appears to be growing student demand for similar master's degrees that focus on *social analysis* or *social inquiry*. A number of peers have related offerings, including Johns Hopkins University (MS in Data Analytics and Policy) and New York University (MA in Applied Quantitative Research). Johns Hopkins had 32 graduates (6 international) and NYU had 17 graduates (8 international) in 2019 alone, signaling success among select current providers. Notably, the proposed master's degree will also likely compete with general data analytics/science programs, which are prolific.

Professional Demand

Graduates of the Master of Science in Applied Quantitative Methods and Social Analysis will be qualified to pursue a wide range of analytical, social science, and academic careers. Overall, US employment for select roles (e.g., Social Scientist, Data Scientist, etc.) is projected to grow by 14% into 2029, faster than the projected growth rate of 8% across all occupations during the 2019 to 2029 period. The fastest projected growth into 2029 among these roles is Statisticians at 30%. Employment growth for Survey Research and Postsecondary Teachers roles, however, are expected to be stagnant into the next decade. As per Table 1, salary prospects for graduates are strong: Statisticians, Data Scientists, and Mathematical Science Occupations have median annual salaries over $90,000. This signals a viable return on investment for prospective students.

Table 1

MS in Quantitative Methods and Social Analysis Graduates *Source: BLS via Emsi Analyst*	2019 Jobs	% Change 2019-2029	Typical Entry Level Degree	Median Annual Earnings
Potential Career Paths				
Total	**126,897**	**14%**	**N/A**	**N/A**
Statisticians	41,713	30%	Master's	$90,834
Social Scientists and Related Workers, All Other	38,051	7%	Bachelor's	$82,852
Data Scientists and Mathematical Science Occupations, All Other	32,735	8%	Bachelor's	$93,913
Social Sciences Teachers, Postsecondary, All Other	19,300	-0.5%	Doctoral / Professional	N/A
Survey Researchers	11,202	0%	Master's	$58,171
Sociologists	3,196	10%	Master's	$81,810

Student Demand

The National Center for Education Statistics' IPEDS database—the typical source to gauge student demand based on degree conferral trends—does not have a CIP Code for Applied Quantitative Methods and Social Analysis. Therefore, CIP Code 45.0102 "Research Methodology and Quantitative Methods" was used as a proxy of demand for this field.

The Research Methodology and Quantitative Methods field is emerging. There were 63 conferrals in 2019, which represented nearly a 20% increase from 2018. As per Table 2, there has been significant growth in this field over the past five years.

Approximately, 24% of quantitative methods and social analysis master's conferrals in 2019 were international, up from 20% in 2015. While this appears to be a largely domestic market, it appears increasingly popular with international audiences.

Another indirect indicator of student demand is the number of individuals enrolled in Coursera's Methods and Statistics in Social Sciences Specialization, which is delivered by the University of Amsterdam. The Coursera website notes that just over 60,000 students are enrolled in the Specialization; however, there is no data on the number of conferred degrees. While this enrollment is substantial, it is much lower compared to the over 400,000 students enrolled in Coursera's Data Science Specialization.

Table 2

Master's Degree Conferrals in Related CIP Codes					
Conferrals by Date	**2015**	**2016**	**2017**	**2018**	**2019**
Research Methodology and Quantitative Methods	2	18	43	54	63

Competitive Landscape

There were only two master's degree providers—Johns Hopkins and NYU—with more than 10 master's degree conferrals in Research Methodology and Quantitative Methods in 2019 (see Table 3). Most institutions launched programs in the last 5 years.

Table 3

Research Methodology and Quantitative Methods Master's Degree Provider	Carnegie Classification	Master's Degree Conferrals					
		2015	**2016**	**2017**	**2018**	**2019**	**Int'l 2019**
Johns Hopkins University	Doctoral: Very High Research Activity	0	3	19	34	**32**	6
New York University	Doctoral: Very High Research Activity	0	13	18	15	**17**	8
Utica College	Master's Colleges & Universities: Larger Programs	0	0	0	0	**9**	0
Saint Louis University	Doctoral: High Research Activity	0	0	4	2	**3**	0
The University of Texas at Dallas	Doctoral: Very High Research Activity	0	0	0	1	**2**	0
Brown University	Doctoral: Very High Research Activity	0	1	2	0	**0**	0
Michigan State University	Doctoral: Very High Research Activity	2	1	0	2	**0**	0

To further identify competitor programs with focus areas specifically related to quantitative methods and social analysis, this analysis scanned websites of peer institutions and conducted keyword searches. In addition to Johns Hopkins and NYU, many of Northeastern's peers have competing programs. Ten of these programs were profiled in more detail to better understand how competitors are positioned and areas where Northeastern could potentially differentiate its offering (a list of additional competing programs is included in the Appendix).

As per Table 4, profiled schools have a variety of program titles; some programs, including Georgetown, Johns Hopkins, UMass-Amherst, and University of Southern California, use popular terms such as Data Analytics or Data Science. There do not appear to be competitors with a title exactly matching Northeastern's proposed title "Master of Science in Applied Quantitative Methods and Social Analysis," although the University of Chicago offers a concentration with the same name as part of a social sciences master's degree (refer to the Appendix). The current program title would provide a differentiation opportunity for Northeastern.

With a duration of one-year (full-time without co-op), Northeastern's program length would be similar to Brown, Columbia, NYU, and USC. With 32 (without co-op) to 34 (with coop) credit hours, Northeastern falls in the middle of the 30 to 39 credit range required by competitors. UMass-Amherst has an accelerated 10-month program, which is the shortest of profiled providers. Georgetown University and the University of Chicago have the longest programs at 2-years (full-time) and require 14 and 18 courses, respectively. The majority of programs are on-ground and correspondingly have a STEM designation. Only Johns Hopkins and UMass-Amherst have online options. The Master of Science in Applied Quantitative Methods and Social Analysis will be differentiated in the market by delivering a flexible, 1-year option in multiple modalities with concentration areas where the College and Northeastern have leading, competitive advantages.

As per Table 5, four of the ten profiled providers offer a concentration/focus option. With 6 concentration options, Northeastern will provide students with the greatest choice in distinctive and unique areas such as Information Ethics and Network Analysis.

In terms of experiential learning opportunities, most competitors incorporate capstone projects. Brown University provides a research internship opportunity, and the University of Chicago has an optional summer practicum. Northeastern's co-op program, a flexible experience up to 6 months, provides a framework to integrate classroom learning with external partners to apply theories and skills in new organizational settings such as the private sector, government, or non-profits. It will be the most robust experiential learning opportunity among profiled competitors.

There is limited evidence available showcasing the effectiveness of competitor targeting strategies. IPEDS conferral data for the Johns Hopkins University (32 conferrals in 2019) and New York University (17) reveals that each of these programs has been able to attract a sizable number of students. Data on the websites of Columbia University and the University of Chicago

suggest that these programs have been even more successful, with Columbia University bringing in 86 students in AY15-16 and University of Chicago bringing in 65 in AY20-21.

Table 4

Peer Competitor Program	Program Title	Duration / Program Format	Delivery Format	Credit Hours	Courses	STEM-Designated
Brown University Department of Sociology	STEM-designated master's (ScM) Social Analysis and Research	1-year FT	On-campus	32	8	Yes
The City University of New York Graduate Center	MS Quantitative Methods in the Social Sciences	1.5 years FT/2.5 years PT	On-campus	30	10	Yes
Columbia University Graduate School of Arts and Sciences	MA Quantitative Methods in the Social Sciences	1-year FT, 2/2.5 years PT	On-campus	30	9	N/A
Georgetown University McCourt School of Public Policy	MS Data Science for Public Policy	2 years FT	On-campus	39	14	Yes
Johns Hopkins University Zanvyl Krieger School of Arts and Sciences	MS Data Analytics and Policy	PT or FT, 16-24 months	Online	36	12	N/A
New York University Graduate School of Arts & Science	MA Applied Quantitative Research	1-year FT/1.5 years PT	On-campus	34	12	Yes
University of Chicago Division of the Social Sciences	MACSS Computational Social Sciences	2 years FT	On-campus	N/A	18	Yes
University of Massachusetts Amherst College of Social & Behavioral Sciences	MS in Data Analytics and Computational Social Science (DACSS)	FT, 10 months	On-Campus	30	10	Yes
	MS in Data Analytics and Computational Social Science (DACSS)	PT	Online	30	10	No
University of Southern California Sol Price School of Public Policy	MS Public Policy and Data Science	1-year FT	On-campus	36	9	N/A

Table 5

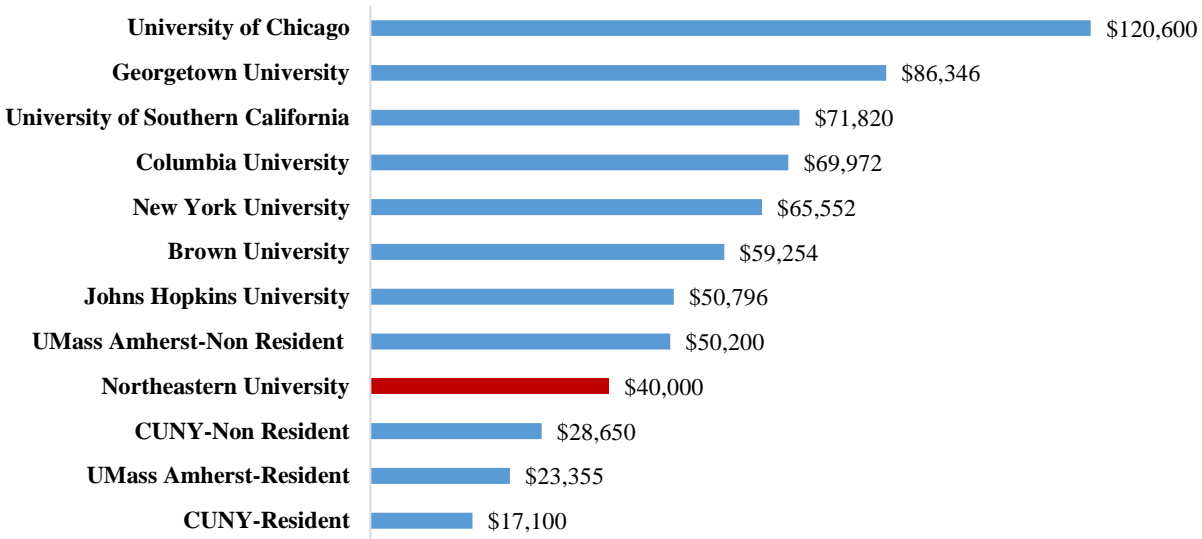| Peer Competitor Program	Concentrations and/or Specializations	Experiential Learning
Brown University Department of Sociology STEM-designated master's (ScM) Social Analysis and Research	1) Qualitative Methods of Investigation and Market Research 2) Spatial Analysis 3) Advanced Multivariate Methods for Population Analysis and Behavioral Modeling	Research Internship that is attached to a faculty Directed Research Practicum (hands-on data analytic research on a faculty project or with an off-campus organization)
The City University of New York Graduate Center MS Quantitative Methods in the Social Sciences	1) Quantitative Methods 2) Analysis of Socio-Economic Inequality at the Global, National, and Urban/ Regional Levels 3) Data Analytics for Learning 4) Demography	Capstone
Columbia University Graduate School of Arts and Sciences MA Quantitative Methods in the Social Sciences	1) Data Science 2) Economics 3) Experiments	Research assistantships
Georgetown University McCourt School of Public Policy MS Data Science for Public Policy	None	None, but students typically do an internship between their 1st and 2nd year
Johns Hopkins University Zanvyl Krieger School of Arts and Sciences MS Data Analytics and Policy	1) Statistical Analysis 2) Geospatial Analysis 3) Political Behavior and Policy Analysis 4) Public Management	Capstone
New York University Graduate School of Arts & Science MA Applied Quantitative Research	None	Thesis
University of Chicago Division of the Social Sciences MACSS Computational Social Sciences	None	Optional summer practicum Thesis
University of Massachusetts Amherst College of Social & Behavioral Sciences MS in Data Analytics and Computational Social Science (DACSS)	None	None
University of Southern California Sol Price School of Public Policy MS Public Policy and Data Science	None	Capstone/Practicum

Table 6

Peer Competitor Program	Target Audience / Career Outcomes	Student Demand
Brown University STEM-designated master's (ScM) Social Analysis and Research	"…ideal for **early-career students** who have an existing foundation in basic statistics and social science research and who desire more focused training in order to be not only prepared, but highly competitive, in acquiring careers in market or social research or as analysts at research and policy institutions."	N/A
The City University of New York MS Quantitative Methods in the Social Sciences	"Our program is designed for **experienced professionals** and scholars as well **recent college graduates**. Students from a variety of academic backgrounds are welcome."	N/A
Columbia University MA Quantitative Methods in the Social Sciences	"..prepare QMSS graduates to enter (or further) an **analytical or research career** or to continue their education in a **PhD** program."	Based on data from 2015-16 academic year cohort: # applications: 430 Incoming Cohort Size: 86
Georgetown University MS Data Science for Public Policy	Aspiring **professionals**: "Oriented towards public service and civic engagement but relevant in the private and nonprofit sectors, graduates of the MS-DSPP program will not only be trained in the tools of data science and quantitative public policy analysis, but also in communicating their solutions effectively in the policy world."	N/A
Johns Hopkins University MS Data Analytics and Policy	"Our graduates go on to **work** as analysts, project managers, and directors of research at federal, state, and local government agencies, as well as consulting firms, technology companies, startups, nonprofit advocacy organizations, and non-government organizations."	32 graduates as of 2019, 6 of which were international
New York University MA Applied Quantitative Research	"A large percentage of graduates of the program will take up research positions in non-profit and government agencies at the federal, state, and local levels, while some will enter **careers** in evaluation, marketing or finance, using the tools developed through the program for analysis of data. Other graduates will enter **doctoral programs** in the social sciences at top universities in the United States and abroad."	17 graduates as of 2019, 8 of which were international
University of Chicago MACSS Computational Social Sciences	"..is designed to prepare students to become the next generation of researchers in computational social science. The majority have gone on to excellent **professional opportunities**, and a smaller number have elected to pursue advanced **PhD** work in the social sciences"	Expect to have 65 first year and 54 second year students in our 2020-21 cohort, for a total of 119 students
University of Massachusetts Amherst MS in Data Analytics and Computational Social Science (DACSS)	"Degree curriculum has been carefully designed to prepare students for the **workforce** and reflects current industry standards for data science professionals."	N/A
University of Southern California MS Public Policy and Data Science	"Potential for distinguished **academic** and **professional** achievement is the principal criterion for admission"	N/A

Budget

As per Table 7, the total tuition for the Master of Science in Applied Quantitative Methods and Social Analysis will be $40,000 (based on 32 semester hours at $1,250 per semester hour). The total cost of the degree will be competitive with peer providers with the exceptions of CUNY and UMass-Amherst's resident rates. Most competitors are priced between $50,000 and $72,000; Georgetown and the University of Chicago are expensive outliers. Tuition per semester hour is aligned to other private research universities. The total cost of the degree varies based on required credit hours and the program length. Optional co-op integration coursework adds 2 semesters hours, and $2,500 to the total cost of the degree.

Table 7

Estimated Total Tuition of Profiled Competitors

University	Tuition
University of Chicago	$120,600
Georgetown University	$86,346
University of Southern California	$71,820
Columbia University	$69,972
New York University	$65,552
Brown University	$59,254
Johns Hopkins University	$50,796
UMass Amherst-Non Resident	$50,200
Northeastern University	$40,000
CUNY-Non Resident	$28,650
UMass Amherst-Resident	$23,355
CUNY-Resident	$17,100

The degree program complements and leverages existing courses and learning opportunities in CSSH. The methodological course offerings further integrate new, full-time faculty that were recently hired in CSSH, including Prof. Moira Zellner (an expert in participatory modeling and spatial analysis) and Prof. Angel Nieves (an expert in the digital humanities, 3D technologies, and ethnographic approaches).

No new courses are planned for the degree program. The program takes advantages of current course offerings in CSSH and other partner colleges at Northeastern. The graduate curriculum in CSSH features interdisciplinary courses in the INSH course offerings.

The College expects to enroll approximately 20 applicants in the initial intake admissions cycle in Fall 2021 and Spring 2022, resulting in projected gross revenue of $800,000. Merit scholarships are estimated to be 20% of revenue, or $160,000. Marketing initiatives are estimated to be $40,000. The result is net revenue of $600,000.

In summary, this proposal presents low risk, as all of the courses already exist and are currently taught across the College. No new courses are proposed.

Program Requirements

Admission Criteria and Process

Applicants to the Master of Science in Applied Quantitative Methods and Social Analysis must submit an application through *ApplyYourself*, consisting of three letters of recommendation, personal statement (that includes a narrative about the applicant's professional goals and interests in the program), resume or curriculum vitae, academic transcript(s), and application fee. The GRE is optional. Applicants are strongly encouraged to demonstrate proficiency in undergraduate coursework in mathematics, statistics, or related areas.

Admission is competitive. The Admissions Committee, consisting of three rotating members of the program's Steering Committee in Applied Quantitative Methods and Social Analysis, will make recommendations to the Program Director for admission. The Associate Dean of the College will issue admissions decisions based on these recommendations. The program will admit on a rolling basis in the Fall and Spring terms.

Degree Requirements

The degree program requires 32 semester hours. In addition, there is an optional cooperative educational experience (e.g., co-op) that will add two semester hours to the degree program. Students must maintain a cumulative grade point average of 3.000 across all coursework, consistent with University and College standards. There are no additional degree program requirements.

Degree Plan

The Master of Science in Applied Quantitative Methods and Social Analysis seeks to enroll students on a full-time basis for two semesters (four courses each semester) with the option of extending the degree program by up to six months to pursue co-op. Students may also complete the degree program on a part-time basis. Students must take two required core courses, choose one concentration consisting of three courses, and enroll in three additional electives. Students pursuing the co-op must enroll in an experiential integration course and a co-op experience course.

Master of Science in Applied Quantitative Methods and Social Analysis

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

Code	Title	Hours
Complete 8 semester hours:		8
INSH 6300	Research Methods in the Social Sciences	4
INSH 6500	Statistical Analysis	4

Required Concentration

Complete one of the following concentrations:

- Data Analytics in the Social Sciences
- Computational Social Science
- Network Analysis in the Social Sciences
- Statistical Methods in the Social Sciences
- Information Ethics

Data Analytics in the Social Sciences

Code	Title	Hours
Complete 12 semester hours:		12
INSH 5301	Introduction to Computational Statistics	4
INSH 5302	Information Design and Visual Analytics	4
DA 5020 or DA 5030	Collecting, Storing, and Retrieving Data Introduction to Data Mining/Machine Learning	4

Computational Social Science

Code	Title	Hours
Complete 12 semester hours:		12
INSH 6406 or INSH 5301	Analyzing Complex Digitized Data Introduction to Computational Statistics	4
INSH 5303 or DA 5030	Machine Learning in the Social Sciences Introduction to Data Mining/Machine Learning	4
INSH 5302 or INSH 5304 or POLS 7334 or PPUA 5262 or PPUA 5263	Information Design and Visual Analytics Social Networks Social Networks Big Data for Cities Geographic Information Systems	4

Network Analysis in the Social Sciences

Code	Title	Hours
Complete 12 semester hours:		12
INSH 5304 or POLS 7334	Social Networks Social Networks	4
INSH 5301	Introduction to Computational Statistics	4
INSH 5302	Information Design and Visual Analytics	4

Statistical Methods in the Social Sciences

Code	Title	Hours
Complete 12 semester hours:		12
INSH 7400	Quantitative Methods	4
INSH 7500	Advanced Quantitative Methods	4
INSH 5301	Introduction to Computational Statistics	4

Information Ethics

Code	Title	Hours
Complete 12 semester hours:		12
CY 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	4
PHIL 5005	Information Ethics	4
PHIL 5001 or PHIL 5002 or PHIL 5010	Global Justice Ethics and Public Policy AI Ethics	4

Electives

Electives are selected in consultation with the Program Director. Concentration courses may not be double counted as elective courses.

Complete 12 semester hours from the following list of courses:

Code	Title	Hours
Complete 12 semester hours:		12
CY 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	4
DA 5020	Collecting, Storing, and Retrieving Data	4
DA 5030	Introduction to Data Mining/Machine Learning	4
ECON 5105	Math and Stats for Economists	4
ECON 5140	Applied Econometrics	4
ECON 5200	Computational Finance and Financial Econometrics	4
HIST 7370	Texts, Maps, and Networks: Readings and Methods for Digital History	4
INSH 5301	Introduction to Computational Statistics	4
INSH 5302	Information Design and Visual Analytics	4
INSH 5303	Machine Learning in the Social Sciences	4
INSH 5304 or POLS 7334	Social Networks Social Networks	4
INSH 5602	Documenting Fieldwork Narratives: Participatory Oral History, Community Ethnography, and Archival Practices	4
INSH 6302	Qualitative Methods	4
INSH 6406	Analyzing Complex Digitized Data	4
INSH 7400	Quantitative Methods	4
INSH 7500	Advanced Quantitative Methods	4
PHIL 5001	Global Justice	4
PHIL 5002	Ethics and Public Policy	4
PHIL 5005	Information Ethics	4
PHIL 5010	AI Ethics	4
PHYS 5116	Complex Networks and Applications	4
PPUA 5260	Ecological Economics	4
PPUA 5261	Dynamic Modeling for Environmental Decision Making	4
PPUA 5262	Big Data for Cities	4

PPUA 5263	Geographic Information Systems for Urban and Regional Policy	4
PPUA 6506	Techniques of Policy Analysis	4
PPUA 6509	Techniques of Program Evaluation	4
PPUA 7237	Advanced Spatial Analysis for Urban Systems	4
JRNL 6341	Telling Your Story With Data	4
JRNL 5400	Media Advocacy in Theory and Practice	4
ARTG 5150	Information Visualization Principles and Practices	4
ARTG 5330	Visualization Technologies I	4

Optional Co-op Experience

Code	Title	Hours
Requires two consecutive semesters of Co-op Work Experience and Experiential Integration.		
INSH 6964 INSH 6864	Co-op Work Experience Experiential Integration	2

Program Credit/GPA Requirements

- 32 total semester hours required (34 with optional co-op)
- Minimum 3.000 GPA required

Appendix 1

Additional Competitors Programs

- American University, MS Data Science with tracks in Applied Public Affairs, International Economic Relations, and Microeconomic Analysis
- Carnegie Mellon University, MSPPM Public Policy & Management - Data Analytics pathway
- Claremont Graduate University, MS in Applied Data Science & International Studies
- Coursera/University of Amsterdam, Methods and Statistics in Social Sciences Specialization
- Duke University, Master in Interdisciplinary Data Science
- Duke University, MA in Analytical Political Economy
- Montclair State University, MA in Social Research and Analysis
- Northwestern University, Master's in Public Policy and Administration - Data Analytics for Public Policy Specialization
- Rutgers, The State University of New Jersey, Master of Public Informatics
- University of Buffalo, MS Data Analytics in Social Sciences
- University of Chicago, MA Social Sciences - Quantitative Methods and Social Analysis Concentration
- University of Illinois – Chicago, MS in Civic Analytics
- University of Pennsylvania, MS in Social Policy + Data Analytics for Social Policy Certificate
- University of Pennsylvania, Master of Philosophy in Education (M.Phil.Ed.) Quantitative Methods
- University of Texas at Dallas, MS Social Data Analytics and Research
- Utica College, MS in Data Science – Social Science Analytics Specialization

Appendix 2

Membership of CSSH Steering Committee on
Big Data and Quantitative Methods Initiatives

- Prof. Gregory Zimmerman, Criminology and Criminal Justice, *Director*
- Prof. Nick Beauchamp, Political Science and Network Science
- Prof. David Lazer, Political Science and Computer Science and Network Science
- Prof. Laura Nelson, Sociology and Network Science
- Prof. Angel Nieves, Cultures, Societies, and Global Studies and History
- Prof. Jun Ma, Economics
- Prof. Cassie McMillan, Sociology and Criminology and Criminal Justice
- Prof. Alicia Sasser Modestino, Public Policy and Urban Affairs and Economics
- Prof. Dan O'Brien, Public Policy and Urban Affairs and Criminology and Criminal Justice
- Prof. Ron Sandler, Philosophy and Religion
- Prof. Moira Zellner, Public Policy and Urban Affairs
- Associate Dean Thomas Vicino, CSSH Dean's Office, *ex officio*

Appendix 3

Programmatic Student Learning Outcomes

Students will be able to:

- Define social problems and operationalize measures and research design

- Articulate the concepts and theories of quantitative analysis for social inquiry

- Utilize a variety of data to analyze the causes and consequences of social problems

- Apply quantitative techniques in the social sciences to contemporary social, economic, political, cultural, and ethical problems in society

- Communicate the results of research to broader audiences including the scientific community and the public

Appendix 4

Draft Assessment Plan

	WHAT	WHERE	HOW	WHO	HOW OFTEN	HOW/WHEN WILL RESULTS BE SHARED WITH FACULTY?
	(Which programmatic student learning outcomes will be assessed)	(Where are the outcomes addressed in the curriculum? i.e., Capstone, Foundation courses)	(What direct AND indirect measures are being used to assess the outcomes? i.e., student final papers, portfolios, senior exit interviews, survey of incoming majors)	(Who is responsible for the assessment? i.e., curriculum committee, accreditation team, small team of faculty members)	(i.e., Annually, once per cycle)	(i.e., Findings will be reported to at full faculty meetings at the first Fall meeting)
YEAR 1	Define social problems and operationalize measures and research design AND Articulate the concepts and theories of quantitative analysis for social inquiry	INSH 6300 INSH 6500	*Direct:* Rubric evaluations of end of year oral presentations *Indirect:* Exit and job placement surveys	Course instructor and student peers; Steering Committee	Annual	Annual spring meeting of the Steering Committee
YEAR 2	Utilize a variety of data to analyze the causes and consequences of social problems	INSH 7400 INSH 7500	*Direct:* Evaluations of research papers and oral presentations *Indirect:* Exit and job placement surveys	Course instructor and student peers; Steering Committee	Annual	Annual spring meeting of the Steering Committee
YEAR 3	Apply quantitative techniques in the social sciences to contemporary social, economic, political, cultural, and ethical problems in society	Concentration courses	*Direct:* Evaluations of research papers and oral presentations *Indirect:* Exit and job placement surveys	Course instructor and student peers; Steering Committee	Annual	Annual spring meeting of the Steering Committee
YEAR 4	Communicate the results of research to broader audiences including scientific community and the public	INSH 6964 INSH 6864	*Direct:* Evaluations of co-op experience *Indirect:* Exit and job placement surveys	Employers and partners; Steering Committee	Annual	Annual spring meeting of the Steering Committee
YEAR 5	COMPREHENSIVE EVALUATION OF DATA AND ASSESSMENT PLAN					