DATA SCIENCE, MS

Roosevelt's Master's in Data Science prepares students for this growing field, which has an expected 36% increase in its labor market over the next decade. Data Scientists clean, process, and transform data using technology in order to effectively analyze it. They must have a thorough understanding of ethical issues in data science to create meaningful analyses. They are skilled at programming, use of data structures, and the fundamental aspects of computer science which influence data analysis. Data scientists have a thorough understanding of statistical methods, mathematical models, and their application to real datasets. They choose an appropriate method, apply it to a dataset using appropriate software and programming packages, and describe the results of this application, making recommendations to employers in science, business, government, and industry

Admission

Applicants should consult the graduate admission resources (https://www.roosevelt.edu/admission/graduate/) on the Roosevelt University website for information on the application process. The graduate program director and department faculty members will evaluate each applicant's individual record of academic achievement, professional experience, and self-assessment. Weakness in one or more areas of preparation will not preclude a positive admission decision. Admissions decisions are at the discretion of the graduate program director and department chair.

APPLICATION MATERIALS

REQUIRED DOCUMENTS

- **Graduate application:** Application (https://www.roosevelt.edu/admission/apply/) to the College of Science, Health and Pharmacy at Roosevelt University.
- **Transcript(s):** Unofficial transcripts from all undergraduate and graduate institutions attended. International applicants must submit official transcripts, and all applicants must have official transcripts on file before starting graduate studies.
- **Proof of English language proficiency (for international students):** See the University English Language Proficiency requirement (https://www.roosevelt.edu/admission/international/english-language-proficiency/) for details. Applicants can receive an admissions decision if this requirement is not met, but may need to complete ELP coursework before they begin graduate studies.

Program prerequisites:

Graduate students must satisfactorily complete the prerequisite courses listed below with grades of C- or higher and with a B- (2.7) average, as well as any courses required of international students by the English Language Program. It is possible to make up any deficiencies after being admitted as a graduate student, but no credit will be granted towards the degree for meeting these requirements. Students may enroll in prerequisite courses and certain graduate courses concurrently, provided the prerequisites for those graduate courses have been satisfied. Program prerequisites must be completed within the first year (18 credits) of coursework unless alternate permission is given by the department chair or graduate advisor. Any of these prerequisites may be waived by a placement exam. The prerequisite courses are:

- Knowledge of derivatives and integrals (as found in MATH 231 CALCULUS I, MATH 202 APPLIED CALCULUS FOR HEALTH SCIENCE AND BUSINESS, or other calculus course),
- Knowledge of vectors and matrices (as found in MATH 246 LINEAR ALGEBRA or similar linear or matrix algebra course),
- Knowledge about graphs (as found in MATH 245 DISCRETE STRUCTURES),
- Introductory programming knowledge (as found in CST 150 COMPUTER SCIENCE I or CST 236 PYTHON SCRIPT PROGRAMMING or similar intro programming course).

Students who require the prerequisite knowledge of vectors, matrices, and graph may obtain that knowledge by taking a graduate course in Mathematical Foundations of AI.

Requirements

Courses must be chosen in consultation with an advisor.

- The completed degree requires a total of 33 credit hours of graduate coursework; for students who have an undergraduate background in introductory statistics, 30 graduate credit hours are required.
- All students must comply with grade requirements in the standard university policy for graduate degrees (https://catalog.roosevelt.edu/graduate/policies/academic-standing/), have a maximum of two grades at the C+ or C level, and have an overall GPA of at least 3.0.
- Students may transfer in up to three 3 credit graduate courses when admitted; these must comply with standard university policy for graduate transfer coursework (https://catalog.roosevelt.edu/graduate/admission/).

Course Requirements

Code	Title	Credit Hours
Introductory Statistics Coursework - Choose One [1]		**3**
ECON 436	QUANTITATIVE ANALYSIS FOR MANAGERS	
HEAL 470	HEALTH CARE ANALYTICS	
Required Courses		
CST 436	COMPUTING WITH DATA IN PYTHON	3
MATH 409	DATA MINING	3
or CST 421	DATA MINING	
MATH 449	REGRESSION & TIME SERIES	3
CST 410	NETWORK SCIENCE	3
Data Ethics Course - Choose One		**3**
CSIA 411	CYBER ETHICS, PRIVACY, & LEGAL	
	Approved data ethics course	
Project-Based Course - Choose One		**3**
MATH 491	INDUSTRIAL APP OF MATH	
MATH 495	INDEPENDENT STUDY (Internship in Data Science) [2]	
	Chair Approved Course with applied data science project component	
Additional Statistics Course - Choose One		**3**
BIOL 418	BIOSTATISTICS	
MATH 457	ANOVA & EXPERIMENTAL DESIGN	
Elective Course - Choose Three		**9**
MATH 477	SURVIVAL MODELS	
MATH 457	ANOVA & EXPERIMENTAL DESIGN	

MATH 432	OPERATIONS RESEARCH	
MATH 475	DERIVATIVES MARKETS	
MATH 447	ADVANCED PROBABILITY	
MATH 448	PROBABILITY AND STATISTICS II	
CST 461	DEEP LEARNING	
CST 486	INFORMATION RETRIEVAL	
CST 411	INTELLIGENCE SYSTEMS	
CST 423	GAME THEORY AND APPLICATIONS	
MATH 428	LINEAR PROGRAMMING & OPTIM	
CST 406	BIG DATA	
BIOL 418	BIOSTATISTICS	
HIN 440	ADVANCED DATA MANAGEMENT & ANALYTICS IN HEALTHCARE	
MATH 490	MASTER'S THESIS	
Additional Project-Based Coursework		
Other Electives with prior chair/program director approval		
Total Credit Hours		**33**

[1] For students who have taken MATH 217 ELEMENTARY STATISTICS, PSYC 200 INTRODUCTORY STATISTICS, or similar, this course requirement is waived. In that situation, the degree will only require 30 graduate credit hours.

[2] Chair approval required OR a Chair-approved course with an applied data science project component.

[1] For Students who have taken MATH 217 ELEMENTARY STATISTICS, PSYC 200 INTRODUCTORY STATISTICS, or similar, this course requirement is waived.

Your degree map is a general guide suggesting courses to complete each term on the academic pathway to your degree. It is based on the most current scheduling information from your academic program. Your program's degree map is reviewed annually and updated as schedules change (although you retain the same course requirements as long as you are continuously enrolled in your degree program).

Year 1

Fall	Credit Hours	Spring	Credit Hours
ECON 436[1]	3	CSIA 411 (or Approved Ethics Course)	3
CST 410	3	CST 4XX/MATH 4XX	3
CST 436	3	MATH 457 or BIOL 418	3
	9		**9**

Year 2

Fall	Credit Hours	Spring	Credit Hours
MATH 449	3	CST 4XX/MATH 4XX	3
CST 421	3	MATH 491 (or Approved Internship)	3
CST 4XX/MATH 4XX	3		
	9		**6**

Total Credit Hours 33