DATA ANALYTICS (M.S.)

Program Highlights
- Designed to meet the demands of an ever-evolving job market
- Develop in-depth knowledge of manipulating large dataset and building computational models
- Explore specific areas of interests, such as Cybersecurity, Economics, Biology, Psychology, Computational Finance, or Urban Studies
- Hands on experience with cutting-edge technologies such as Tableau, Spark, Deep Learning and Natural Language Processing

Program Basics
- Curriculum requires 10 courses for a total of 30 credits, including five core courses, four electives, and a Capstone Project.
- A master's thesis is optional – if taken, it consists of two subsequent courses which replace the Capstone Project and one elective.
- One (1) internship (optional – if taken, this replaces the Capstone Project)
- Designed as a one-to-two year program
- Evening courses to accommodate working professionals

Admissions

Prerequisites
- Applicants with undergraduate degrees in non-computer science areas are welcome.
- An undergraduate degree in a field emphasizing quantitative skills is expected, such as a degree in computer science, information science, engineering, math, physical science, health science, business, economics, psychology, social science or urban and city planning.
- Knowledge of discrete math, probability and statistics, including permutations, combinations, descriptive statistics, and basic probabilities concepts.
- Basic programming knowledge and a familiarity with Python programming is expected. This knowledge can be acquired via completion of CISC 5380 PROGRAMMING WITH PYTHON

Admitted students who seek to bypass CISC 5380 PROGRAMMING WITH PYTHON must take a placement examination, which is administered by the department prior to the beginning of each entry term. The exam covers fundamentals of Python programming language. Students who earn a grade lower than a B are required to enroll in CISC 5380 PROGRAMMING WITH PYTHON in their first semester of study. This bridge course can be taken concurrently with courses that fulfill degree requirements.

Guidelines and Information

Completed applications will include each of the following items:

Official degree transcripts confirming prior degree conferral should be ordered at least one month prior to the application deadline. Please ensure that they are sent directly to the Office of Admissions (fuga@fordham.edu) via secure electronic delivery. If electronic delivery is not available, please request that your transcripts be submitted directly via post, in a sealed envelope, to: Graduate School of Arts and Sciences, Office of Admissions, Fordham University, 441 E. Fordham Rd., Bronx, NY 10458. Please note: you may upload unofficial copies of your transcripts to your application while the Office of Admissions awaits receipt of your official transcripts. Please ensure that all official transcripts from previously attended post-secondary institutions are submitted in English, or are accompanied by a certified English translation. Transcripts and credentials conversion information is available on the GSAS International Students page.

Official GRE scores are required if an applicant wishes to be considered for GSAS merit-based financial aid. GREs for this program are otherwise recommended. The scores should be sent directly by the testing service to the Office of Graduate Admissions, Fordham University, Graduate School of Arts and Sciences – Code #2259.

Resume/CV (submit via the online application)
- Statement of intent (up to 500 words, submitted electronically, via the online application)
- Three letters of recommendation (submitted directly by referees via the online application)

English Proficiency

International applicants whose native language is not English are required to complete and submit to GSAS prior to matriculation their official scores from the Test of English as a Foreign Language (TOEFL). GSAS will also consider a student’s International English Language Testing System (IELTS)—Cambridge English Proficiency Level language testing results.

Official TOEFL or IELTS scores should be sent directly by the testing service to the Office of Graduate Admissions, Fordham University, Graduate School of Arts and Sciences – Code # 2259. TOEFL minimum 85*, IELTS equivalent 6.5. Please consult the English Proficiency web page for additional information.

*Applicants with TOEFL scores below 85 may still apply.

Tuition Rate for Professional Master's Programs
Please visit the GSAS Tuition and Fees page to view the tuition rate for the Computer and Information Science programs.

Application Deadlines
For information see Application Deadlines.

Conditional Acceptances
There are no conditional acceptances, only changes to degree requirements such as added coursework taken while students are in the program.

Requirements

The master’s program in Data Analytics requires 30 credits of coursework (ten classes), which will typically be completed in one to two years. Classes are offered in the evenings and during weekends. Please consult the Admissions Requirements page for more information about applying to the program.

Courses must be taken as follows:

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- Five (5) core courses
- Four (4) electives (from one or more thematic clusters)
- One of the following options:
  - CISC 6080 Capstone Project in Data Analytics (preferred option)
  - CISC 6085 Master’s Thesis in Data Analytics I and CISC 6086 Master’s Thesis in Data Analytics II, which reduces the number of required electives by one.
  - CISC 6081 Data Analytic Practicum (Internship)

## Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>Five Core Courses from the following:</strong></td>
<td></td>
<td>15</td>
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<tr>
<td>CISC 5500</td>
<td>DATA ANALYTICS TOOLS&amp;SCRIPTING¹</td>
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<tr>
<td>CISC 5450</td>
<td>Mathematics for Data Analytics</td>
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<tr>
<td>CISC 5825</td>
<td>COMPUTER ALGORITHMS</td>
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<tr>
<td>or CISC 5835</td>
<td>Algorithms for Data Analytics</td>
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<tr>
<td>CISC 6930</td>
<td>DATA MINING</td>
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<tr>
<td>CISC 5950</td>
<td>BIG DATA PROGRAMMING</td>
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<tr>
<td>CISC 5800</td>
<td>MACHINE LEARNING</td>
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<tr>
<td>CISC 5900</td>
<td>INFORMATION FUSION</td>
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**Three elective courses, selected from any mix of options within the thematic clusters:** 9

### Big Data and Cloud Computing
- CISC 5550 CLOUD COMPUTING
- CISC 5640 NO SQL DATABASE SYSTEMS
- CISC 6000 Deep Learning
- CISC 6210 Natural Language Processing
- CISC 6325 DATABASE SYSTEMS
- CISC 6745 DATA VISUALIZATION
- CISC 6735 WIRELESS NETWORKS
- CISC 5700 COGNITIVE COMPUTING
- CISC 5009 NETWORK ESSENTIALS
- CISC 6525 ARTIFICIAL INTELLIGENCE

### Cybersecurity
- CISC 5650 CYBER SECURITY ESSENTIALS
- CISC 6640 PRIVACY AND SECURITY IN BIG DATA
- CISC 6680 INTRUSION DETECTION AND NETWORK FORENSICS
- CISC 5750 INFORMATION SECURITY AND ETHIC

### Bioinformatics and Health Informatics
- CISC 6500 BIOINFORMATICS
- CISC 6550 SYSTEMS NEUROSCIENCE
- CISC 6700 MEDICAL INFORMATICS
- BISC 6525 BIOSTATISTICS
- BISC 7745 MOLECULAR BIOLOGY
- or BISC 7502 EUKARYOTIC MOLECULAR BIOLOGY
- BISC 8710 SEMINAR IN GENETICS

### Financial Informatics
- CISC 5350 FINANCIAL PROGRAMMING
  - or CISC 5352 FINANCIAL PROGRAMMING AND APPLICATIONS
- CISC 6300 COMPUTATIONAL FINANCE
- CISC 6350 ADVANCED FINANCIAL PROGRAMMING
- ECON 6950 FINANCIAL ECONOMETRICS

### Behavioral Informatics
- PSYC 6850 EVALUATION OF PSYCHOLOGICAL & SOCIAL PROGRAMS
- PSYC 7804 REGRESSION WITH LAB
- PSYC 7816 INTRODUCTION TO MULTIVARIATE ANALYSIS
- PSYC 7830 STRUCTURAL EQUATION MODELING
- PSYC 7850 HIERARCHICAL LINEAR MODELS
- PSYC 7920 ITEM RESPONSE THEORY

### Media Informatics
- PMMA 6103 DATA JOURNALISM AND INTERACTIVE GRAPHICS
- PMMA 6205 ONLINE ANALYTICS AND METRICS

### One selection from the following: 6

- Master Thesis ³
- CISC 6085 MASTER THESIS IN DATA ANALYTICS I
- CISC 6086 MASTER THESIS IN DATA ANALYTICS II

### Capstone and Fourth Elective
- CISC 6080 CAPSTONE PROJECT IN DATA ANALYTICS
- One additional elective from the selection above

### Internship and Fourth Elective
- One additional elective from the selection above

### Total Credits
- 30

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¹ CISC 5500 DATA ANALYTICS TOOLS&SCRIPTING must be taken in the first semester. (Computer Programming is a prerequisite for this course)

² CISC 6930 DATA MINING must be taken in the first semester if possible and preferably be taken before CISC 5800 and CISC 5900.

³ Capstone and thesis courses can only be taken during the second or third semester.