DATA SCIENCE (M.S.)

Overview

Program Highlights
- Designed to meet the demands of an ever-evolving job market
- Develop in-depth knowledge of manipulating large data sets and building computational models
- Explore specific areas of interests, such as Cybersecurity, Economics, Biology, Psychology, Computational Finance, and 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 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

Degree Requirements

The master's program in Data Science requires 30 credits of coursework (10 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.
Data Science (M.S.)

Course | Title | Credits
--- | --- | ---
Five Core Courses (see below) | | 15
Four elective (4) courses from one or more of the following of eight (8) thematic clusters | | 12

Computer and Data Science
Cybersecurity
Bioinformatics and Health Informatics
Financial Informatics
Urban and City Informatics
Election and Government Informatics
Behavior Informatics
Media Informatics

One of the following options: 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISC 6080</td>
<td>Capstone Project in Data Science</td>
<td>3</td>
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<tr>
<td>CISC 6085 &amp; CISC 6086</td>
<td>Master’s Thesis in Data Science I and Master’s Thesis in Data Science II</td>
<td>3</td>
</tr>
<tr>
<td>CISC 6081</td>
<td>Data Science Practicum (internship)</td>
<td>3</td>
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</tbody>
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Total Credits 30

1 Students completing two semesters of thesis (6 credits) may complete one fewer 3-credit elective.

Data Science Core Courses

Five courses are required from the list below. Courses on this list have the DATI attribute code.

Course | Title | Credits
--- | --- | ---
CISC 5450 | Mathematics for Data Science | 3 |
CISC 5500 | Data Science Tools and Scripting | 3 |
CISC 5790 | Data Mining | 3 |
CISC 5800 | Machine Learning | 3 |
CISC 5835 | Algorithms for Data Science | 3 |
CISC 5900 | Information Fusion | 3 |
CISC 5950 | Big Data Programming | 3 |

Thematic Clusters

All courses that can apply to the M.S. in Data Science have the DATA attribute code.

Computer and Data Science courses

Course | Title | Credits
--- | --- | ---
CISC 5550 | Cloud Computing | 3 |
CISC 5640 | NoSQL Database Systems | 3 |
CISC 5700 | Cognitive Computing | 3 |
CISC 6000 | Deep Learning | 3 |
CISC 6210 | Natural Language Processing | 3 |
CISC 5325 | Database | 3 |
CISC 6525 | Artificial Intelligence | 3 |
CISC 6745 | Data Visualization | 3 |

Cybersecurity courses

Course | Title | Credits
--- | --- | ---
CISC 5009 | Network Essentials | 3 |
CISC 5650 | Cybersecurity Essentials | 3 |

Bioinformatics and Health Informatics courses

Course | Title | Credits
--- | --- | ---
CISC 5450 | Bioinformatics | 3 |
CISC 6550 | Systems Neuroscience | 3 |
BISC 7502 | Eukaryotic Molecular Biology | 4 |

Financial Informatics courses

Course | Title | Credits
--- | --- | ---
CISC 5352 | Financial Programming and Applications | 3 |
CISC 6350 | Advanced Financial Programming | 3 |
ECON 6950 | Financial Econometrics | 3 |
ECON 6910 | Applied Econometrics | 3 |

Urban and City Informatics courses

Course | Title | Credits
--- | --- | ---
URST 5000 | Issues in Urban Studies | 3 |
URST 6200 | Research Skills in Urban Studies | 3 |
BISC 7529 | Principles of Geographical Information Science | 4 |

Election and Government Informatics courses

Course | Title | Credits
--- | --- | ---
POSC 5100 | American Political Behavior | 3 |
POSC 5130 | Political Institutions and Processes | 3 |
POSC 5251 | Political Survey Research | 3 |

Behavior Informatics courses

Course | Title | Credits
--- | --- | ---
PSYC 6850 | Evaluation of Psychological and Social Programs | 3 |
PSYC 7804 | Regression with Lab | 3 |
PSYC 7830 | Structural Equation Modeling | 3 |
PSYC 7920 | Item Response Theory | 3 |

Media Informatics courses

Course | Title | Credits
--- | --- | ---
PMMA 6103 | Data Journalism and Interactive Graphics | 3 |
PMMA 6205 | Online Analytics and Metrics | 3 |

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