Data Architecture and Management, MS (Toronto)

Admissions to this program will open for the 2026-2027 academic year.

For program contact information, please visit this website (https://coe.northeastern.edu/academics-experiential-learning/academic-departments/mgen/ms-daam/).

Many MS programs in the data area deal with data collection and analysis but do not, however, address a crucial activity that data scientists, data analysts, business analysts, and many software engineers need to perform to make that data valuable—data integration. That activity may also be referred to as data preparation, data curation, application integration, and data engineering based on the integration of use cases and integration persona. The Master of Science in Data Architecture and Management focuses on these activities.

Data systems engineering occurs because data is fragmented and usually scattered across many data sources. However, even if all the data one needed were in one place, there is still an intensive need for integration. Information is data in context and the context of data as collected is different than the many ways it needs to be transformed so as to generate useful information.

The data engineering field could be thought of as a superset of business intelligence and data warehousing that brings in more elements from software engineering. This discipline also integrates specialization around the operation of so-called Big Data distributed systems, along with concepts around the extended Hadoop ecosystem, stream processing, and in computation at scale.

The Master of Science in Data Architecture and Management offers a multitude of courses in data engineering in addition to supplementary courses that are required to deliver the data results in a meaningful way to management. We plan to cover data management, advanced data management, data warehousing and business intelligence, column databases, data science engineering, and Big Data engineering. On the software engineering side, we offer advanced Big Data programming using the powerful Scala language and a course on advanced data science as well as cloud computing. Multithread concurrent computing is also offered as it is important for synchronizing a huge set of servers working in parallel to do large-scale analytics to make things run faster by hundredfold increases in speed. Due to the high-level mathematical operations required to make these programs run, only software engineers can make the necessary mathematical algorithms execute quickly enough to work in these complicated areas and get the finest results.

Degree Requirements

Students in the program must complete 32 semester hours of approved coursework with a minimum grade-point average of 3.000. Students complete a master's degree by pursuing a thesis.

The thesis must be carried out under the supervision of a professor and must have prior approval of the program director. Proposals for a thesis need to be submitted at least one month before the start of the semester.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

Code	Title	Hours
DAMG 6105	Data Science Engineering with Python	4
DAMG 6210	Data Management and Database Design	4
DAMG 7250	Big Data Architecture and Governance	4
DAMG 7370	Designing Advanced Data Architectures for Business Intelligence	4

Thesis

Code	Title	Hours
DAMG 7945	Master's Project	4
DAMG 7990	Thesis	4
Complete 8 semester hours from the electives course list below.		8
In addition to completing the thesis course, students must successfully complete the thesis submission process, including securing committee and Graduate School of Engineering signatures and submission of an electronic copy of their MS thesis to ProQuest.		

Electives

Code	Title	Hours
Complete the remaining semester hours from the following electives (in the subject codes CSYE, DAMG and INFO)		8
DAMG 7245	Big-Data Systems and Intelligence Analytics	
DAMG 7275	Advanced Database Management Systems	

DAMG 7350	Systems and Cybersecurity Fundamentals
DAMG 7370	Designing Advanced Data Architectures for Business Intelligence
DAMG 7374	Special Topics in Data Architecture and Management
CSYE 6200	Concepts of Object-Oriented Design
CSYE 6205	Concepts of Object-Oriented Design with C++
CSYE 6220	Enterprise Software Design
CSYE 6225	Network Structures and Cloud Computing
CSYE 6230	Operating Systems
CSYE 6305	Introduction to Quantum Computing with Applications
CSYE 7105	High-Performance Parallel Machine Learning and AI
CSYE 7125	Advanced Cloud Computing
CSYE 7200	Big-Data System Engineering Using Scala
CSYE 7215	Foundations of Parallel, Concurrent, and Multithreaded Programming
CSYE 7220	Deployment and Operation of Software Applications
CSYE 7230	Software Engineering
CSYE 7270	Building Virtual Environments
CSYE 7280	User Experience Design and Testing
CSYE 7370	Deep Learning and Reinforcement Learning in Game Engineering
CSYE 7374	Special Topics in Computer Systems Engineering
CSYE 7470	Advanced Game Analytics
CSYE 7550	Distributed Intelligent Agents in the Metaverse
INFO 5100	Application Engineering and Development
INFO 5101	Lab for INFO 5100
INFO 6105	Data Science Engineering Methods and Tools
INFO 6150	Web Design and User Experience Engineering
INFO 6205	Program Structure and Algorithms
INFO 6250	Web Development Tools and Methods
INFO 7225	Accounting and Budgetary Systems for Engineers
INFO 7245	Agile Software Development
INFO 7255	Advanced Big-Data Applications and Indexing Techniques
INFO 7260	Business Process Engineering
INFO 7385	Managerial Communications for Engineers
INFO 7390	Advances in Data Sciences and Architecture
INFO 7500	Cryptocurrency and Smart Contract Engineering

Optional Co-op Experience

Code	Title	Hours
Complete the following (students must complete ENCP 6000 to qualify for co-op experience):		
ENCP 6000	Career Management for Engineers	1
ENCP 6964	Co-op Work Experience	0
or ENCP 6954	Co-op Work Experience - Half-Time	
or ENCP 6955	Co-op Work Experience Abroad - Half-Time	
or ENCP 6965	Co-op Work Experience Abroad	

Program Credit/GPA Requirements

32 total semester hours required (33 with optional co-op)

Minimum 3.000 GPA required