

# Information Systems, MSIS (Toronto)

We offer cutting-edge expertise in a variety of courses that combine technological advances and business practices. We stress creative and inventive approaches to problem solving, which necessitates empowering students so that they can take charge of their own software projects to become originally productive. Our information systems program (<https://coe.northeastern.edu/academics-experiential-learning/academic-departments/mgen/ms-insy/>) is as much an art as a science. It bypasses mechanical learning and highlights the value and excitement of engineering thinking that gets things done efficiently as well as imaginatively. We balance theory and practice, on the premise that they are always intertwined and interdependent.

We seek to provide a basic foundation for our students and then seek to push them to new heights to advance their information technology skills in a way that keeps up and, better yet, exceeds the necessarily fast pace of this progressive field. It is not for us just a question of not being left behind; we strive to be at the forefront of software innovation in an effort to transform contemporary society even more radically than technology has already done—to take gigantic strides in business, medicine, education, and security.

## Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

### Core Requirements

| Code                       | Title                                                            | Hours |
|----------------------------|------------------------------------------------------------------|-------|
| INFO 5100<br>and INFO 5101 | Application Engineering and Development<br>and Lab for INFO 5100 | 4     |

### Options

Complete one of the following options:

#### PROJECT OPTION

| Code                                                                                                                            | Title            | Hours |
|---------------------------------------------------------------------------------------------------------------------------------|------------------|-------|
| INFO 7945                                                                                                                       | Master's Project | 4     |
| Complete 24 semester hours from the Electives course list below. A minimum of 12 semester hours must be INFO courses.<br>(p. 1) |                  | 24    |

#### THESIS OPTION

| Code                                                                                                                           | Title            | Hours |
|--------------------------------------------------------------------------------------------------------------------------------|------------------|-------|
| INFO 7945                                                                                                                      | Master's Project | 4     |
| INFO 7990                                                                                                                      | Thesis           | 4     |
| Complete 20 semester hours from the Electives course list below. A minimum of 8 semester hours must be INFO courses.<br>(p. 1) |                  | 20    |

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 |
|-----------|--------------------------------------------------------------------|-------|
| CSYE 6200 | Concepts of Object-Oriented Design                                 |       |
| CSYE 6205 | Concepts of Object-Oriented Design with C++                        |       |
| 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 7235 | Model-Driven Architecture                                          |       |
| CSYE 7270 | Building Virtual Environments                                      |       |
| CSYE 7280 | User Experience Design and Testing                                 |       |
| CSYE 7374 | Special Topics in Computer Systems Engineering                     |       |

|                            |                                                                        |
|----------------------------|------------------------------------------------------------------------|
| CSYE 7380                  | Theory and Practical Applications of AI Generative Modeling            |
| DAMG 6105                  | Data Science Engineering with Python                                   |
| DAMG 6210                  | Data Management and Database Design                                    |
| DAMG 7245                  | Big-Data Systems and Intelligence Analytics                            |
| DAMG 7250                  | Big Data Architecture and Governance                                   |
| 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                     |
| INFO 5001                  | Application Modeling and Design                                        |
| INFO 5002                  | Introduction to Python for Information Systems                         |
| INFO 6105                  | Data Science Engineering Methods and Tools                             |
| INFO 6106                  | Neural Modeling Methods and Tools                                      |
| INFO 6150                  | Web Design and User Experience Engineering                             |
| INFO 6205                  | Program Structure and Algorithms                                       |
| INFO 6215                  | Business Analysis and Information Engineering                          |
| INFO 6245                  | Planning and Managing Information Systems Development                  |
| INFO 6250<br>and INFO 6251 | Web Development Tools and Methods<br>and Lab for INFO 6250             |
| INFO 6255                  | Software Quality Control and Management                                |
| INFO 6350                  | Smartphones-Based Web Development                                      |
| INFO 6660                  | Business Ethics and Intellectual Property for Engineers                |
| INFO 7110                  | High-Performance Coding for Fintech                                    |
| INFO 7225                  | Accounting and Budgetary Systems for Engineers                         |
| INFO 7245                  | Agile Software Development                                             |
| INFO 7250                  | Engineering of Big-Data Systems                                        |
| INFO 7255                  | Advanced Big-Data Applications and Indexing Techniques                 |
| INFO 7260                  | Business Process Engineering                                           |
| INFO 7285                  | Organizational Change and IT                                           |
| INFO 7374                  | Special Topics in Information Systems                                  |
| INFO 7375                  | Special Topics in Artificial Intelligence Engineering and Applications |
| INFO 7380                  | User Experience Design for Healthcare Applications                     |
| INFO 7385                  | Managerial Communications for Engineers                                |
| INFO 7390                  | Advances in Data Sciences and Architecture                             |
| INFO 7405                  | Advances in Engineering Medical Information Systems                    |
| INFO 7410                  | Advanced Medical Device Software Engineering                           |
| INFO 7500                  | Cryptocurrency and Smart Contract Engineering                          |
| INFO 7510                  | Smart Contract Application Engineering and Development                 |
| INFO 7520                  | Engineering of Advanced Cryptocurrency Systems                         |
| INFO 7525                  | Regulatory Aspects of Smart Contract Automation                        |
| INFO 7535                  | Digital Smart Contracts Product Innovations                            |
| INFO 7610                  | Special Topics in Natural Language Engineering Methods and Tools       |
| INFO 7976                  | Directed Study                                                         |
| TELE 5330<br>and TELE 5331 | Data Networking<br>and Lab for TELE 5330                               |
| TELE 5350                  | Telecom and Network Infrastructure                                     |
| TELE 5360                  | Internet Protocols and Architecture                                    |
| TELE 5600                  | Linux/UNIX Systems Management for Network Engineers                    |
| TELE 6300                  | Communication and Network Security                                     |
| TELE 6400                  | Software-Defined Networking                                            |
| TELE 6420                  | Infrastructure Automation Design and Tools                             |
| TELE 6500                  | Machine Learning for IoT Systems                                       |
| TELE 6510                  | Fundamentals of the Internet of Things                                 |
| TELE 6530                  | Connected Devices                                                      |

|           |                                          |
|-----------|------------------------------------------|
| TELE 6550 | IoT Embedded System Design               |
| TELE 7374 | Special Topics in the Internet of Things |

### 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