Information Technology, BS (Oakland)

The Bachelor of Science in Information Technology focuses on the skills and knowledge needed to promote career advancement and pursue advanced degrees in information technology and to provide the critical thinking and information technology skills needed by local, national, and global employers.

Students have the opportunity to develop strengths in the analysis, applied design, development, implementation, and management of modern information technology systems. Courses cover the critical technology areas of programming for traditional, web, and mobile applications and for networking, database, and information security. The curriculum also includes courses focused on key business areas needed to integrate and manage technology and technology projects in the workplace.

The curriculum develops the technical and problem-solving skills that allow graduates to pursue careers in the professional areas of applications development, web and multimedia design, systems and network administration, database administration, and business analysis.

Program Requirements

Complete all courses listed below unless otherwise indicated.

Universitywide Requirement

Minimum 120 total semester hours required

Minimum 2.000 GPA required

Students must earn a minimum of 60 Northeastern University semester hours in order to receive a bachelor's degree.

Note: Individual program requirements may exceed the above minima.

CPS Undergraduate Core Requirements

All College of Professional Studies undergraduate students are required to complete the CPS Undergraduate Core Requirements (https://catalog.northeastern.edu/professional-studies/university-academics/general-education-requirements/).

Foundation Courses

27-28 semester hours required

Code	Title	Hours
English		
ENG 1105 and ENG 1106	College Writing 1 and Lab for ENG 1105	4
ENG 1107 and ENG 1108	College Writing 2 and Lab for ENG 1107	4
ENG 3105 and ENG 3106	Writing for the Professions: Science and Engineering and Lab for ENG 3105	4
Management		
MGT 1100	Introduction to Business	3
MGT 2310	Organizational Behavior	3
Mathematics		
MTH 1100	College Algebra	3
Complete one of the following:		3-4
CS 5002	Discrete Structures (recommended for students pursuing the Computer Science concentration)	
MTH 2400	Technology and Applications of Discrete Mathematics	
Philosophy		
Complete one of the following:		3
ITC 3620	Legal and Ethical Issues in Cybersecurity	
PHL 2100	Business Ethics	
PHL 2140	Ethical Issues in Science and Engineering	

Major Requirements

33 semester hours required

Code	Title	Hours
ITC Core Discipline Areas		
ITC 1200	Operating Systems Concepts	3
ITC 2016	End-User Data Analysis Tools	3
ITC 2050	Designing the User Experience	3
ITC 2100	Introduction to Programming (Java)	3
ITC 2200	Networking Foundations	3
ITC 2300	Database Management Systems	3
ITC 2400	Web and Mobile Development	3
Complete one of the following:		3
ITC 2000	Principles of Systems Analysis and Design	
ITC 2430	E-Commerce Systems	
Professionalism		
ITC 3500	IT Project Management	3
ITC 4600	Information Security Management	3
Capstone		
ITC 4850	Information Technology Project	3

Concentrations or Elective Option

A concentration is not required. Students who choose not to declare a concentration will complete the Professional Electives Option.

- Analytics (p. 2)
- Applications Development (p. 2)
- Computer Science (p. 3)
- Systems Administration and Cybersecurity (p. 4)
- Professional Electives Option (p. 4)

Note: Please consult with your advisor.

ANALYTICS CONCENTRATION

Code	Title	Hours
Complete seven courses from the following that have not been taken to fulfill major requirements:		21
ALY 2010	Probability Theory and Introductory Statistics	
ALY 2100	Introduction to Programming for Data Analytics	
ALY 3015	Intermediate Statistics for Data Analytics	
ALY 3040	Data Mining	
ALY 3070	Communication and Visualization for Data Analytics	
ALY 4000	Analytics Using R	
ITC 3300	Structured Query Language (SQL)	
or ITC 3310	Exploring NoSQL Databases	
Complete two additional ITC or ALY courses that have not been taken to fulfill major or concentration requirements.		6

APPLICATIONS DEVELOPMENT CONCENTRATION

Code	Title	Hours
Complete seven courses from the following that have not been taken to fulfill major requirements:		21
ALY 2010	Probability Theory and Introductory Statistics	
ALY 2100	Introduction to Programming for Data Analytics	
CET 2200	Data Structures and Algorithms	
GET 2100	Computer Engineering Programming and Analysis	
ITC 2430	E-Commerce Systems	
ITC 3100	Advanced Applications Development (Android)	
ITC 3150	Database Websites	
ITC 3300	Structured Query Language (SQL)	
ITC 3310	Exploring NoSQL Databases	
ITC 3320	Data Warehousing Technologies	
ITC 3400	Web Design and Multimedia	

ITC 4640	Foundations of Cloud Computing	
ITC 4690	Software Engineering and Security	
ITC 4973	Topics in Emerging Information Technologies	
PJM 3000	Leading Agile Projects	
Complete two additional ITC or ALY courses that have not been taken to fulfill major requirements.		6

COMPUTER SCIENCE CONCENTRATION

Students must apply to the Master of Science in Computer Science PlusOne program before enrolling in CS or CY courses. Please contact your advisor.

Code	Title	Hours
CS 5004 and CS 5005	Object-Oriented Design and Recitation for CS 5004 [1]	4
CS 5008 and CS 5009	Data Structures, Algorithms, and Their Applications within Computer Systems and Recitation for CS 5008	4
CS 5800	Algorithms [1]	4
Complete three courses from the following that have not been taken to fulfill major requirements:		9
CET 2200	Data Structures and Algorithms	
ITC 3100	Advanced Applications Development (Android)	
ITC 3150	Database Websites	
ITC 3300	Structured Query Language (SQL)	
ITC 3310	Exploring NoSQL Databases	
ITC 4640	Foundations of Cloud Computing	
ITC 4690	Software Engineering and Security	
Complete two CS or CY courses from required MSCS breadth areas. [1]		8
Systems and Software		
CS 5400	Principles of Programming Language	
CS 5500	Foundations of Software Engineering	
CS 5520	Mobile Application Development	
CS 5600	Computer Systems	
CS 5610	Web Development	
CS 5700	Fundamentals of Computer Networking	
CS 6410	Compilers	
CS 6510	Advanced Software Development	
CS 6650	Building Scalable Distributed Systems	
Theory and Security		
CS 6760	Privacy, Security, and Usability	
CS 7805	Complexity Theory	
CS 7810	Foundations of Cryptography	
CY 5770	Software Vulnerabilities and Security	
CY 6740	Network Security	
Artificial Intelligence and Data Science		
CS 5100	Foundations of Artificial Intelligence	
CS 5150	Game Artificial Intelligence	
CS 5200	Database Management Systems	
CS 6120	Natural Language Processing	
CS 6140	Machine Learning	
CS 6200	Information Retrieval	
CS 6220	Data Mining Techniques	
CS 6240	Large-Scale Parallel Data Processing	
CS 7140	Advanced Machine Learning	

[1]   Graduate courses that may be used toward the Master of Science in Computer Science when part of the PlusOne program.

SYSTEMS ADMINISTRATION AND CYBERSECURITY CONCENTRATION

Code	Title	Hours
Complete seven courses from the following that have not been taken to fulfill major requirements:		21
ITC 3220	Mobile and Wireless Networking	
ITC 3250	UNIX Systems Administration	
ITC 3620	Legal and Ethical Issues in Cybersecurity	
ITC 4200	Network Security	
ITC 4640	Foundations of Cloud Computing	
ITC 4660	Encryption Concepts	
ITC 4670	Software Vulnerabilities	
ITC 4680	Forensics in Information Technology	
ITC 4690	Software Engineering and Security	
ITC 4973	Topics in Emerging Information Technologies	
Complete two additional ITC or ALY courses that have not been taken to fulfill major requirements.		6

PROFESSIONAL ELECTIVES OPTION

Code	Title	Hours
Those who do not choose a concentration should take 27 additional semester hours in the following subject areas:		27
ALY, CET, GET, ITC		

Open Electives

Complete a minimum of 33* semester hours of CPS undergraduate general education and open electives to reach 120 semester hours.

*   Computer science concentration students: Complete a minimum of 30 semester hours of CPS undergraduate general education and open electives to reach 120 semester hours.

Plan of Study

Term 1	Hours
ENG 1105 and ENG 1106	4
ITC 1200	3
MGT 1100	3
MTH 1100	3
Complete one of the following:	3
ITC 3620	
PHL 2100	
PHL 2140	
	16

Term 2	Hours
ENG 1107 and ENG 1108	4
ITC 2016	3
ITC 2050	3
MTH 2400 or CS 5002 (4 semester hours recommended for PlusOne students)	3-4
Open elective	3
	16-17

Term 3	Hours
ITC 2200	3
ITC 2400	3
MGT 2310	3
Complete one of the following:	3
ITC 2000	
ITC 2430	
MGT 2210	

Open elective	3
	15

Term 4	Hours
ITC 2100	3
Concentration or major elective	3
Open elective	3
Open elective	3
Open elective	3
	15

Term 5	Hours
ENG 3105 and ENG 3106	4
ITC 2300	3
Concentration or major elective	3
Open elective	3
Open elective	3
	16

Term 6	Hours
ITC 3500	3
Concentration or major elective	3
Concentration or major elective	3
Concentration or major elective	3
Open elective	3
	15

Term 7	Hours
ITC 4600	3
Concentration or major elective	3
Concentration or major elective	3
Open elective	3
Open elective	3
	15

Term 8	Hours
ITC 4850	3
Concentration or major elective	3
Concentration or major elective	3
Open elective (Note: PlusOne students consult advisor to reach 120 semester hours)	3
	12

Total Hours: 120-121