

Major in Computer Science

Major in Computer Science for the Bachelor of Science Degree

To declare a major in Computer Science, a student must fill out the "Declaration of Major Form" available in the Department Office. A student must complete the major requirements in effect when the declaration of major is accepted by the Department. Students should obtain a Computer Science Major handbook in order to be aware of any changes in requirements.

University Core Curriculum Requirements

General Education Distribution Area	Cr. Hrs.
Fine Arts (FA)* 2 courses, from at least two of the following areas of study: Art, CMT (Mass Media or Theatre), Music (includes Dance).	6
Humanities (HU)* 3 courses, from at least two of the following areas of study: CMT (Communication), English, Linguistics, Philosophy, Women's and Gender Studies, World Languages and Cultures, (Note: No more than two foreign language courses may be used to fulfill this requirement.)	9
Behavioral/Social Sciences (SB)* 3 courses, from at least two of the following areas of study: African & African American Studies, Anthropology, Computer Science, Economics, Geography & Environmental Studies, History, Justice Studies, Latino & Latin American Studies, Political Science, Psychology, Sociology, Social Work	9
Natural Sciences (NS and NSL)** 3 courses, from at least two of the following areas of study; one course must have a laboratory component (NSL): Biology, Chemistry, Earth Science, Environmental Science, Physics (Note: If an FYE ANTH that counts as Natural Science is taken, only one Biology course may be used for Natural Science).	9

Engaged Learning Experiences

Students must complete, at Northeastern, three courses designated as Engaged Learning Experiences courses. One of the Engaged Learning Experiences courses must be at the 300-level, and one Engaged Learning Experiences course must be designated as "Boundary Crossing".

Discipline Specific (ELE-DS)

These courses have pre-requisites that are specific courses within a program of study. Discipline Specific courses give students a deeper understanding of how knowledge is created and applied in their field.

Boundary Crossing (ELE-X)

These are courses that cross disciplinary boundaries and/or cross boundaries through engagements outside the classroom or University allowing students to see how knowledge gained in one field might inform other fields or other aspects of society.

Math/Quantitative Reasoning (MA)

1 Math course, that has intermediate Algebra as prerequisite OR is a course listed on the General Education Distributive Learning List of Approved Courses. Any 3 hour college level math course, beyond Intermediate Algebra, meets this requirement.

* Majors in Fine Arts, Humanities or Social/Behavioral Sciences, may waive up to 6 credit hours of General Education requirements in the corresponding distribution area.

** Majors in Natural Sciences may waive up to 9 credit hours of General Education requirements in the Natural Sciences distribution area.

Students should also be aware of all other university requirements to obtain a degree - NEIU requirements (<http://catalog.neiu.edu/graduation-requirements/bachelors-degree/>)

Major Requirements

Forty-eight hours of computer science course work including at least 36 hours of 300-level courses. Students should also be aware of the University requirements for the Bachelor's degree. Transfer students must complete a minimum of 24 credit hours of 300-level Computer Science courses at Northeastern and meet all major requirements.

Students who intend to pursue a Master's degree in Computer Science should plan on completing Calculus II and are advised to take a course in Linear Algebra.

Code	Title	Hours
Required Core Courses:		
CS-200	Programming Fundamentals	4
CS-201	Discrete Structures	3
CS-207	Object-Oriented Programming And Data Structures	5
CS-301	Computer Organization	3
CS-308	Operating Systems	3
CS-319	Writing Intensive Program: Fundamentals Of Software Engineering	3
CS-324	Introduction To The Design Of Algorithms	3
Total Hours		24

NO SUBSTITUTIONS ARE ALLOWED FOR CORE COURSES.

Computer Science Concentration:

This concentration is designed primarily for students intending to pursue an advanced degree in Computer Science. However, it is appropriate for any student whose goal is to understand the fundamentals of Computer Science.

Code	Title	Hours
Required Courses		
CS-325	Theory Of Computation	3
CS-335	Artificial Intelligence	3
CS-355	Cryptography	3
Select three of the following:		9
CS-307	Programming Languages	
CS-315	Modern Database Management	
CS-331	Computer Networks	
CS-334	Open Source Systems	
CS-340	Fundamentals Of Computer Graphics	
CS-341	Parallel Computing And Distributed Systems	
CS-342	Introduction To Human Computer Interaction	
CS-343	Introduction To Natural Language Processing	
Two CS 300-level electives, approved by the CS Department		6
CS Core Courses		24
Total Hours		48

Computer Networks and Security Concentration:

This concentration is designed to prepare students for employment in a computer security related field.

Code	Title	Hours
Required Courses		
CS-331	Computer Networks	3
CS-355	Cryptography	3
CS-360	CyberSecurity	3
Select three of the following:		9

CS-315	Modern Database Management	
CS-323	Cyberlaw	
CS-334	Open Source Systems	
CS-335	Artificial Intelligence	
CS-341	Parallel Computing And Distributed Systems	
CS-345	Network Security	
CS-361	Secure Programming And Testing	
Two CS 300-level electives, approved by the CS Department		6
CS Core Courses		24
Total Hours		48

Information Technology Concentration:

This concentration is designed to prepare students for employment involving Web development and computer network design and maintenance.

Code	Title	Hours
Required Courses		
CS-315	Modern Database Management	3
CS-331	Computer Networks	3
CS-339	Fundamentals Of Information Technology Project Management	3
Select three of the following:		9
CS-300	Client Side Web Development	
CS-317	Event-Driven Programming	
CS-321	Server Side Web Development	
CS-334	Open Source Systems	
CS-335	Artificial Intelligence	
CS-342	Introduction To Human Computer Interaction	
CS-347	Mobile Application Development	
CS-360	CyberSecurity	
Two CS 300-level electives, approved by the CS Department		6
CS Core Courses		24
Total Hours		48

CYBERSECURITY CONCENTRATION:

This concentration is designed to prepare students for employment involving network and information security, digital forensics, and security requirements analysis and design.

Code	Title	Hours
Required Courses		
CS-331	Computer Networks	3
CS-355	Cryptography	3
CS-360	CyberSecurity	3
Select three of the following:		9
CS-260	Computer Security	
CS-315	Modern Database Management	
CS-323	Cyberlaw	
CS-343	Introduction To Natural Language Processing	
CS-345	Network Security	
CS-349	Introduction To The Internet Of Things	
CS-351	Data Wrangling For Data Analysis	
CS-362	Digital Forensics	
Two CS 300-level electives, approved by the CS Department		6

CS Core Courses	24
Total Hours	48

Data Science Concentration:

This concentration is designed to prepare students for employment involving data analysis, research and also prepares students to conduct academic research

Code	Title	Hours
Required Courses		
CS-315	Modern Database Management	3
CS-322	Applied Research and Data Analysis	3
CS-351	Data Wrangling For Data Analysis	3
Select three of the following:		9
CS-327	Computational Methods In Biology	
CS-329	Decision Theory	
CS-335	Artificial Intelligence	
CS-342	Introduction To Human Computer Interaction	
CS-343	Introduction To Natural Language Processing	
CS-349	Introduction To The Internet Of Things	
GES-372	GIS Across Disciplines	
MATH-275	Applied And Computational Statistics	
MATH-305	Probability And Statistics	
MATH-307	Introduction To Stochastic Processes	
MATH-365	Statistical Computer And Data Analysis Packages	
ECON-220	Business And Economics Statistics I	
ECON-318	Introduction To Econometrics And Forecasting	
ECON-343	Macroeconomic Data Analysis	
ECON-346	Applied Economic Statistics Using R	
MNGT-351	Data Visualization And Management	
MNGT-352	Model-Based Decision Making	
MNGT-353	Supply Chain Analytics	
MNGT-368	Business Statistics	
MNGT-377	Production/Operations Management	
MNGT-379	Business Analytics	
MKTG-353	Marketing Research	
Two CS 300-level electives, approved by the CS Department		6
CS Core Courses		24
Total Hours		48

First Year

Term 1		Hours
ENGL-101	Writing I	3
MATH-173	College Algebra	4
General Education course		3
General Education course		3
General Education course		3
Term Hours		16
Term 2		Hours
CS-200	Programming Fundamentals	4
CS-201	Discrete Structures	3
General Elective course		3
General Elective course		3
Elective Course		3
Term Hours		16

Second Year

Term 1		
CS-207	Object-Oriented Programming And Data Structures	5
CS-301	Computer Organization	3
General Education course		3
General Education course		3
General Education course		3
Term Hours		17

Term 2		
CS-308	Operating Systems	3
CS-319	Writing Intensive Program: Fundamentals Of Software Engineering	3
CS Course from concentration		3
General Education course		3
General Education course		3
Term Hours		15

Third Year

Term 1		
CS-324	Introduction To The Design Of Algorithms	3
CS course from concentration		3
CS course from concentration		3
Elective		3
Elective		3
Term Hours		15

Term 2		
Course from concentration		3
Course from concentration		3
Computer Science elective		3
Elective		3
Elective		3
Term Hours		15

Fourth Year

Term 1		
CS course from concentration		3
Computer Science elective		3
Elective		3
Elective		3
Elective		3
Term Hours		15

Term 2		
Computer Science elective		3
Computer Science elective		3
Elective		3
Elective		3
Term Hours		12
Total Hours:		121