

Computer Science Curriculum Fall 2023 – Spring 2024

Math 20100 Calculus I Pre: Math 19500 (C min) 4 cr.	Science Elective ⁵ 4 cr.	Engl 11000 Freshman Composition 3 cr.	Speech 11100 ⁶ Foundations of Speech Comm. 3 cr.	Liberal Arts 3 cr.
Math 21200 Calculus II Pre: Math 20100 (C min) 4 cr.	Science Elective ⁵ 4 cr.	CSc 10300 Intro to Computing for Majors Pre: Math 19500 (C min) or Pre/Co: Math 20100 (C min) 3 cr.		CSc 10400 Discrete Math Structures Pre: Math 20100 (C min) 4 cr.
Math 21300 Calculus III Pre: Math 21200 (C min) 4 cr.	CSc 21100 Fund. of Computer Systems Pre: CSc 10300 or permission 3 cr.	CSc 21200 Data Structures Pre: CSc 10300 or permission, & CSc 10400 3 cr.	CSc 21700 Probability & Statistics for Computer Sci Pre: CSc 10300, CSc 10400 & Math 20100 (C min) 3 cr.	Liberal Arts 3 cr.
Math 34600 Elements of Linear Algebra Pre: Math 21200 (C min) or Math 20300 (C min.) 3 cr.	Science Elective ⁵ 4 cr.	CSc 22000 Algorithms Pre: CSc 21200 3 cr.	CSc 22100 Software Design Lab Pre: CSc 21200, & Engl 21007 or 2100x 3 cr.	CSc 11300 Programming Language Pre: CSc 10300 1 cr.
CSc 30400 Theoretical Computer Sci. Pre: CSc 22000 3 cr.	CSc 30100 Numerical Issues in Scientific Prog. Pre: CSc 21700, CSc 22000, Math 21300 (C min) or Math 20300 (C min) & Math 34600 (C min) 3 cr.	CSc 38000 Computer Security. Pre: CSc 21100 or (CSc 21000 & EE 21000), and Csc 22000 3 cr.	CSc 33500 Programming Language Paradigms Pre: CSc 22000 & CSc 22100 3 cr.	CSc 32200 Software Engineering Pre: CSc 22000 & CSc 22100 3 cr.
A. Theory & Application Elective ⁹ (Select One)		CSc 33200 Operating Systems Pre: CSc 22000 & (CSc 22100) 4 cr.	CSc 34200 Computer Organization Pre: CSc 21100 or (CSc 21000 & EE 21000) Co: CSc 34300 3 cr.	CSc 34300 Computer Organ. Lab Co: CSc 34200 1 cr.
CSc 42200: Computability CSc 42300: Intro to Distrib Algor CSc 42800: Formal Lang & Automa CSc 44800: Artificial Intelligence 3 cr.	CSc 45000: Comb & Graph Theo CSc 48000: Cryptography CSc 48600: Computa Complex	Engr 27600 Engineering Economics Pre: Math 20100 (C min) 3 cr.	Eco 10400 Intro. Quant. Economics Pre: Math 20100 or 20500	
B. Computational Techniques For Sci & Engr Elective ⁹ (Select One)		Technical Elective ⁸ Courses in Computer Science, Biology, Chemistry, EAS, Math, Physics, & Engineering, excluding: (1) courses at the 10000 level; (2) courses with no prerequisites; (3) "professional" courses; (4) project & seminar courses; (5) duplicate courses. 3 cr.	CSc 36000 Modern Distributed Computing Pre: CSc 33200 3 cr.	CSc 59866 Senior Design Project I Pre/Co: Senior, Perm. (two consecutive semesters) 3 cr.
CSc 44000: Computational Methods CSc 44200: Systems Simulation CSc 44500: Big Data Mgmt & Analys CSc 44600: Math. Optimization Tech. CSc 44700: Intro to Machine Learning CSc 46000: Intro to Data Science 3 cr.	CSc 47000: Image Processing CSc 47100: Computer Vision CSc 47200: Computer Graphics CSc 47400: Visualization CSc 47900: Digital Libraries	Liberal Arts (20000 or higher) 3 cr.		
C. Computer Systems Elective ⁹ (Select One)		Technical Elective ⁸ Courses in Computer Science, Biology, Chemistry, EAS, Math, Physics, & Engineering; excluding: (1) courses at the 10000 level; (2) courses with no prerequisites; (3) "professional" courses; (4) project & seminar courses; (5) duplicate courses. 3 cr.	CSc 59867 Senior Design Project II Pre: CSc 59866 3 cr.	Liberal Arts (20000 or higher) 3 cr.
CSc 31800: Internet Prog CSc 41200: Computer Networks CSc 42000: Compiler Construct CSc 43000: Distributed Comput CSc 43500: Concur. in Oper Sys. 3 cr.	CSc 43800: Real-Time Comput Syst CSc 45600: Top In Mod Software Engr CSc 47300: Website and Web App CSc 49200: Web Security			

1. **The latest version of the curriculum sheet supersedes any curriculum and requisites in the Undergraduate Bulletin or online.**
2. **"C" Passing Grade Requirement:** Courses in shaded area (■) require a minimum passing grade of "C".
3. **Skills tests:** Certain students may be required to pass CUNY Assessment Tests in one or more subjects within 1 or 2 years of admission.
4. **Liberal Arts electives:** Computer science students must take **four** approved courses, of which at least two must have course numbers of 20000 or higher. They should satisfy each of the Flexible Core (Pathways) liberal arts requirements in the Creative Expression (CE), World Cultures & Global Issues (WCGI), Individual & Society (IS), and U.S. Experience (US) areas. Prior courses in these four areas from other colleges can satisfy the electives. See cnycuny.edu/engineering/pathways for details and the Pathways course lists. A prior degree may remove the requirement of all four courses.
5. **Science Elective Requirements:** Students are required to take at least 12 credits of science. These credits must include one of the following sequences: (a) Bio 10100 & 10200 (8 cr.), (b) Chem 10301 & 10401 (8 cr.), or (c) Phys 20700 & 20800 (8cr.). In addition students need to take at least one more course in Biology, Chemistry or Physics at a level not lower than the required in Biology, Chemistry or Physics.
6. **Speech Requirements:** Students who are exempted from Speech 11100 must take another speech course in its place.
7. ENGL 21007 (Writing for Engineering), Speech 11100 (Foundation of Speech Communications) and ENGR 27600 (Engineering Economics) or Econ 10400 (Economics) are required courses in the Computer Science major, and not just General Education requirements.
8. **Free/Technical Elective Requirements:** CSc 10000 can be used as a Free Elective **only** if it is taken before CSc 10300. CSc 31700 (The Internet) counts only as a free elective. Co-op Option: Computer science students with an approved application can take the co-op option (CSc 59001 – 3cr., CSc 59002 – 3cr., CSc 59003 – 3cr., CSc 59004 – 0cr.), where they can earn up to 9 academic credits. Inquire with the department for more information. **CSc 20500 (Introduction to Blockchain, 3 cr.) can be used as a Technical or Free elective.**
9. **CSc Electives:** Take one course in each of three elective groups (A – C).
10. **Other Graduation Requirements:** Apply for graduation during registration for the last semester. Minimum GPA of 2.00. Minimum QPA of zero. Residency Requirement: 33 credits of 30000-level or higher Computer Science courses taken at CCNY.
11. **Program Changes:** Substitution of other courses for required courses must be approved by the Chair of the Computer Science Department (NAC-8/206), and the Associate Dean of the Office of Undergraduate Affairs (ST-209).
12. ENGR 10200 (A data science and statistical approach to programming) 3 cr., and ENGR 20200 (Bridge to C++) 0 cr., are only for non-computer science students.

Total Credits: 127.