REQUIREMENTS FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE

for students matriculated **Fall 2025** *or after*

To receive the BS degree in computer science, students must earn a minimum of 126 credit hours, including transfer credits, with a minimum 2.0 (C) grade-point average in computer science major courses, and a minimum cumulative grade-point average of 2.0.

Credit Requirements - A minimum of 126 semester credits of which:
- a minimum of 60 credits must be in liberal arts and sciences courses
- a minimum of 40 credits must be earned in Computer Science Watson College
- a minimum of 45 credits must be completed at the 300-level or above

Area Requirements

1. **Communications** .... 8 credits
   - One course that meets the Binghamton University General Education Composition requirement.
   - CS 301. Ethical, Social and Global Issues in Computing.
2. **Humanities/social science electives** .... 20 credits
3. **Science** .... 8 or 10 credits[1]
   - Two or three course sequence: BIOL 113 BIOL 114 & BIOL 115 or CHEM 104 CHEM 105 & CHEM 106 or PHYS 131 & PHYS 132[2]
4. **Mathematics**[2] .... 20 credits
   - MATH 224/225. Differential/Integral Calculus · MATH 327. Probability with Statistical Methods · MATH 226/227. Integration Tech. & Appl/Infinite Series (or MATH 448. Mathematical Statistics)
   - MATH 314. Discrete Math. (or MATH 330. Number Systems)
   - One elective chosen from:

MATH 304. Linear Algebra	MATH 381. Graph Theory	MATH 407. Intro. to the Theory of Numbers
MATH 371. Ordinary Diff. Equations	MATH 386. Combinatorics	

5. **Mathematics or Science Elective** .... 4 credits
   - MATH 323. Calculus III or a science elective chosen from courses that meet the General Education Laboratory Science requirement
6. **Free electives** .... 12 or 14 credits[1]
   At least four credits must be in liberal arts and science. At most one free elective in liberal arts and science may be taken pass/fail instead of a letter grade. At most 2 credits of activity/wellness may be used as free elective credit.
7. **Computer Science (prerequisites are listed in the tables on Page 2)**[3]   52 credits

- CS 101. Professional Skills, Ethics and CS Trends	- CS 320. Advanced Computer Architecture
- CS 120. Programming and Hardware Fundamentals[4]	- CS 350. Operating Systems
- CS 210. Programming with Objects and Data Structures[4]	- CS 373. Automata Theory & Formal Languages
- CS 220. Architecture from Programmer's Perspective	- CS 375. Design & Analysis of Algorithms
- CS 310. Data Structures and Algorithms	- CS 471. Programming Languages

   - **Computer Science electives (at least 15 credits) chosen from A, B, C, D, and E below. At least one course must be chosen from each of the areas A, B, and C, and courses with multiple areas count as meeting all the areas indicated. Courses from areas D and E are optional. At most one can be taken from E. (Prerequisites are listed in the tables on Page 2):**
   A: Networking and Communications, B: Large Software Development, C. Data and Information Management, D: Other courses, E. Internship, Co-op, Research

- CS 402. Software and Engineering Project Management (D)	- CS 445. Software Engineering (D)
- CS 415. Social Media Data Science Pipeline (C)	- CS 447. High Performance Computing (A, B)
- CS 417. Intro to Human Computer Interaction (D)	- CS 451. Systems Programming (A, B)
- CS 424. Intelligent Mobile Robotics (D)	- CS 452. Intro. To Cloud Computing (A)
- CS 426. Internet of Things (A)	- CS 453. Software Security (D)
- CS 427. Mobile Systems Security (A)	- CS 455. Intro. to Visual Info. Processing (B, C)
- CS 428. Computer Networks (A, B)	- CS 456. Intro. to Computer Vision (D)
- CS 432. Database Systems (B, C)	- CS 457. Intro. to Distributed Systems (A, B)
- CS 433. Information Retrieval (B, C)	- CS 458. Intro. to Computer Security (A)
- CS 435. Introduction to Data Mining (C)	- CS 459: Science of Cyber Security (D)
- CS 436. Introduction to Machine Learning (C)	- CS 460: Computer Graphics (B)
- CS 440. Advanced Topics in OO Programming (A, B)	- CS 461: Topics in Data Privacy (D)
- CS 441. Game Dev. for Mobile Platforms (D)	- CS 465. Intro. to Artificial Intelligence (C)
- CS 442. Design Patterns (A, B)	- CS 472. Compiler Design (B)
- CS 444. Programming for the Web (A, B)	- CS 476. Programming Models for Emerging Platforms (B)

   - CS 480. Any approved CS topics course Prerequisites vary by course and any future approved CS 400-level course (D, others as appropriate)

   E. To count as a CS elective, must be taken for a total of 3 credits
   CS 395. Computer Science Internship. Prerequisites: CS 220, 240, junior or senior standing and CS Department approval
   CS 396. Computer Science Co-op. Prerequisites: CS 220, 240, junior or senior standing and CS Department approval
   CS 499. Undergrad. Research. Prerequisites vary by research area. Requires junior or senior standing, supervision by a Computer Science faculty member, and completion of CS Department approval form

General Education Requirements Students must fulfill the General Education Requirements for Computer Science. Students normally complete these requirements within the 126-credit program described above.

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[1] The total of the science and free elective credits (Items 3 and 6) should be 22 credits.

[2] Pre-requisites for Mathematics and Science courses appear in the University Academic Guide entries for the Mathematics and Science programs.

[3] CS pre-requisites must have a grade of at least C- (except CS 301). See the University Academic Guide for all other grade restrictions.

[4] CS 110 is a prerequisite. CS Majors may request a waiver from the Undergraduate Director based on prior programming experience.

Supplemental information regarding the BSCS Degree Requirements

The following information supplements that provided in the University Academic Guide. It applies to students who matriculated Fall 2016 or after.

All required Computer Science courses, except CS 101, are offered every semester. The minimum grade in a required Computer Science course must be at least a C- to be allowed to take any Computer Science course, for which it is a prerequisite.

Calculus Topics are broken down as follows:
- MATH 224. Differential Calculus
- MATH 225. Integral Calculus
- MATH 226. Integration Techniques and Applications
- MATH 227. Infinite Series

Humanities/Social Science – May be filled by courses offered by the Division of Humanities, the Division of Social Sciences, the Psychology Department and HDEV courses offered by the College of Community and Public Affairs. Many of the courses taken to meet the General Education requirements will fulfill the Humanities/Social Science requirement.

Mathematics - Students who are strong in math are encouraged to take MATH 330 (Number Systems) instead of MATH 314 (Discrete Mathematics). Students with a strong math background may take MATH 381 (Graph Theory) as their Math elective. The following Binghamton University course can be substituted for MATH 327: MATH 448 (Mathematical Statistics), which has a prerequisite of MATH 323 and MATH 447.

Free Electives – May be filled by extra courses from any of the areas listed above, SOM courses, or additional Computer Science courses. A maximum of 2 HWS credits may be counted as Free Elective credits. At least four free elective credits must be in Liberal Arts and Science in order to ensure the 60 credits needed for a BS degree. CS 110 counts as a free elective.

Prerequisites for Computer Science Courses

The MATH and CS pre-requisites must have a grade of at least C-.

Course	Prerequisites
CS 101	None
CS 110	MATH 225[1]
CS 120	CS 110, MATH 225[1]
CS 210	CS 110, MATH 225
CS 220	CS 120, 140
CS 310	CS 120, 140, MATH 226[1]
CS 301	CS 101, Gen Ed C/J course, CS 220/240[2]
CS 320	CS 220
CS 350	CS 220, 240, 301[1]
CS 373	CS 140, MATH 314/330[2,3]
CS 375	CS 240, MATH 227, 314/330[2,3], CS 301[1]
CS 402	CS 220, 240
CS 415	CS 350, 375, MATH 327/448[2,3]
CS 424	CS 350, 375
CS 426	CS 320/350
CS 427	CS 350, CS 375
CS 428	CS 350
CS 432	CS 375
CS 433	CS 375
CS 435	CS 375, MATH 304, 327/448[2,3]

Course	Prerequisites
CS 436	CS 375, MATH 327/448[2,3]
CS 440	CS 240, 350
CS 441	CS 140, 375
CS 442	CS 140, 375
CS 444	CS 320/350/375[2]
CS 445	CS 350/375
CS 447	CS 220, CS 240, (CS 320/350[2])
CS 451	CS 350
CS 452	CS 350
CS 453	CS 350
CS 455	CS 375
CS 456	CS 375
CS 457	CS 350
CS 458	CS 350, 375
CS 459	CS 375, MATH 327/448[2,3]
CS 460	CS 375
CS 465	CS 375
CS 471	CS 373, 375
CS 472	CS 373, 375
CS 476	CS 140, 320, 350

[1] Can be taken concurrently with the course in the left column

[2] The notation Course1/Course2 indicates that these courses are alternatives: take either Course1 or Course2.

[3] Prerequisites for MATH courses are found in the University Academic Guide for the Mathematics Programs.

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