

Computer Science

Department Information

- **Department Web Site:**
www.ndsu.edu/cs/ (<http://www.ndsu.edu/cs/>)
- **Credential Offered:**
B.S.; B.A.; Minor
- **Sample Program Guide:**
catalog.ndsu.edu/programs-study/undergraduate/computer-science/ (<http://catalog.ndsu.edu/programs-study/undergraduate/computer-science/>)

Major Requirements

Major: Computer Science

Degree Type: B.S.

Minimum Degree Credits to Graduate: 120

University Degree Requirements

1. Satisfactory completion of all requirements of the curriculum in which one is enrolled.
2. Earn a minimum total of 120 credits in approved coursework. Some academic programs exceed this minimum.
3. Satisfactory completion of the general education requirements as specified by the university.
4. A minimum institutional GPA of 2.00 based on work taken at NDSU.
5. At least 30 credits must be NDSU resident credits. Resident credits include credits registered and paid for at NDSU.
6. At least 36 credits presented for graduation must be in courses numbered 300 or higher.
7. Students presenting transfer credit must meet the NDSU residence credits and the minimum upper level credit. Of the 30 credits earned in residence, a minimum of 15 semester credits must be in courses numbered 300 or above, and 15 semester credits must be in the student's curricula for their declared major.

For complete information, please refer to the Degree and Graduation Requirements (<http://catalog.ndsu.edu/past-bulletin-archive/2024-25/academic-policies/undergraduate-policies/degree-and-graduation/>) section of this Bulletin.

University General Education Requirements

A list of university approved general education courses and administrative policies are available here (<http://catalog.ndsu.edu/past-bulletin-archive/2024-25/academic-policies/undergraduate-policies/general-education/#genedcoursestext>).

Code	Title	Credits
Category C: Communication		12
ENGL 110	College Composition I	
ENGL 120	College Composition II	
COMM 110	Fundamentals of Public Speaking	
Upper Division Writing [†]		
Category R: Quantitative Reasoning [†]		3
Category S: Science and Technology [†]		10
Category A: Humanities and Fine Arts [†]		6
Category B: Social and Behavioral Sciences [†]		6
Category W: Wellness [†]		2
Category D: Cultural Diversity ^{*†}		
Category G: Global Perspectives ^{*†}		
Total Credits		39

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Courses for category D & G are satisfied by completing D & G designated courses in another general education category.

†

General education courses may be used to satisfy requirements for both general education and the major, minor, and program emphases, where applicable. Students should carefully review major requirements to determine if specific courses can also satisfy these general education categories.

Major Requirements

A Grade of 'C' or better is required for all CSCI prefix courses.

Code	Title	Credits
B.S. Computer Science Core Requirements		
CSCI 160 or CSCI 227 & CSCI 228	Computer Science I Computing Fundamentals in Python I and Computing Fundamentals in Python II	4 or 6
CSCI 161	Computer Science II	4
CSCI 213	Modern Software Development	3
CSCI 222	Discrete Mathematics	3
CSCI 313	Software Development with Frameworks	3
CSCI 336	Theoretical Computer Science	3
CSCI 366	Database Systems	3
CSCI 372	Comparative Programming Languages	3
CSCI 374	Computer Organization and Architecture	3
CSCI 445	Software Projects Capstone ¹	3
CSCI 455	Networking and Parallel Computation	3
CSCI 467	Algorithm Analysis	3
CSCI 474	Operating Systems Concepts	3
CSCI 489	Social Implications of Computers ¹	3
MATH 165	Calculus I (May satisfy general education category R)	4
MATH 166	Calculus II	4
STAT 367	Probability	3
STAT 368 or STAT 330 & STAT 331	Statistics Introductory Statistics and Regression Analysis	3 or 5
Track: Select one track from the four listed below		12
Total Credits		70-74

STANDARD TRACK

Code	Title	Credits
Select one of the following:		3
MATH 129	Basic Linear Algebra	
CSCI 277	Introduction to UNIX	
Computer Science Electives:		9
Select 3 didactic courses from any 300-400 level CSCI prefix courses that are not part of the core requirement.		
Total Credits		12

CYBERSECURITY TRACK

Code	Title	Credits
CSCI 277	Introduction to UNIX	3
Cybersecurity Electives:		9
CSCI 403	Defensive Network Security	
CSCI 404	Ethical Hacking	
CSCI 405		
CSCI 408	Malware Detection, Analysis and Threat Mechanisms	
CSCI 409	Cybersecurity Law and Policy	
CSCI 410	Computer Crime and Forensics	

CSCI 411	Secure Software Development	
CSCI 469	Network Security	
CSCI 473	Foundations of the Digital Enterprise	
Total Credits		12

DATA SCIENCE TRACK

Code	Title	Credits
MATH 129	Basic Linear Algebra	3
Data Science Electives:		9
CSCI 411	Secure Software Development	
CSCI 420	Introduction to Data Science in Python	
CSCI 422	Fundamentals of Data Engineering	
CSCI 425	Machine Learning	
CSCI 426	Introduction to Artificial Intelligence	
CSCI 428	Artificial Intelligence, Ethics, and the Environment	
CSCI 436	Intelligent Agents	
CSCI 450	Cloud Computing	
CSCI 479	Introduction to Data Mining	
Total Credits		12

SOFTWARE ENGINEERING TRACK

Code	Title	Credits
Select one of the following:		3
MATH 129	Basic Linear Algebra	
CSCI 277	Introduction to UNIX	
Software Engineering Electives:		9
CSCI 411	Secure Software Development	
CSCI 412	Mobile Software Engineering	
CSCI 413	Principles of Software Engineering	
CSCI 416	Software Architecture and Design	
CSCI 419	Software Testing and Debugging	
CSCI 422	Fundamentals of Data Engineering	
CSCI 450	Cloud Computing	
CSCI 473	Foundations of the Digital Enterprise	
CSCI 488	Human-Computer Interaction	
Total Credits		12

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Department Capstone: CSCI 445 Software Projects Capstone (typically taken during the last spring semester prior to degree completion) & CSCI 489 (<http://catalog.ndsu.edu/past-bulletin-archive/2024-25/search/?P=CSCI%20489>) Social Implications of Computers (typically taken during the last fall semester prior to degree completion)

Major Requirements

Major: Computer Science

Degree Type: B.A.

Minimum Degree Credits to Graduate: 120

University Degree Requirements

1. Satisfactory completion of all requirements of the curriculum in which one is enrolled.
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Major Requirements

A Grade of 'C' or better is required for all CSCI prefix courses.

Code	Title	Credits
B.A. Computer Science Core Requirements		
CSCI 114	Computer Applications (May satisfy general education category S)	3
or TL 116	Business Software Applications	
CSCI 159	Computer Science Problem Solving	3
CSCI 160	Computer Science I	4 or 6
or CSCI 227 & CSCI 228	Computing Fundamentals in Python I and Computing Fundamentals in Python II	
CSCI 161	Computer Science II	4
CSCI 213	Modern Software Development	3
CSCI 222	Discrete Mathematics	3
CSCI 312	Survey of Programming Languages	3
CSCI 313	Software Development with Frameworks	3
CSCI 366	Database Systems	3
CSCI 371	Web Scripting Languages	3
CSCI 445	Software Projects Capstone ¹	3
CSCI 488	Human-Computer Interaction	3
CSCI 489	Social Implications of Computers ¹	3
Related Major Requirements		
COMM 260	Introduction to Web Design	3

COMM 261	Introduction to Web Development (or any 300/400 level CSCI elective)	3
MATH 146 or MATH 165	Applied Calculus I (May satisfy general education category R) Calculus I	4
STAT 330	Introductory Statistics	3
STAT 331	Regression Analysis	2

Other Courses:

Select these seven credits from the following areas: 7

Science	Cannot be courses with the CSCI prefix
Engineering	Cannot be ENGR 311 or ENGR 312
Math	MATH prefix course with a number higher than MATH 147, but not MATH 165
Statistics	STAT prefix course (except for STAT 330 or STAT 331)

BA Degree Requirements

Proficiency at the second year level in a modern foreign language.

Total Credits 63-65

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CSCI 445 Software Projects Capstone & CSCI 489 Social Implications of Computers form the department capstone. CSCI 445 is typically taken during the last spring semester and CSCI 489 is typically taken during the last fall semester prior to degree completion.

Minor Requirements

Minor: Computer Science

Minimum Credits: 16

Minor Requirements

Code	Title	Credits
Required Courses		
CSCI 213	Modern Software Development	3
Choose one of the following sequences:		8-9
CSCI 160 & CSCI 161	Computer Science I and Computer Science II	
CSCI 227 & CSCI 228 & CSCI 229	Computing Fundamentals in Python I and Computing Fundamentals in Python II and Computing Fundamentals in Python III	
Additional Electives: Select 5 or 6 credits to reach the minor 16 cr. minimum (at least 3 credits must be CSCI 300-400 level).		5-6
Total Credits		16-18

Minor Requirements and Notes

- A minimum of 8 credits must be taken at NDSU.
- A grade of 'C' or better is required in all courses applied to this minor.

Certificate Requirements

Computer Science

Minimum Credits: 11

Code	Title	Credits
CSCI 160	Computer Science I	4
CSCI 161	Computer Science II	4
CSCI 277	Introduction to UNIX	3
Total Credits		11