COMPUTER SCIENCE (ARTIFICIAL INTELLIGENCE) - BACHELOR OF SCIENCE

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria (through 9/30/2022).

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication Honors	3
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [3]	4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [3]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448	Senior Project	4
or C S 449	Senior Thesis	
C S 471	Programming Language Structure I	3
C S 474	Operating Systems I	3
C S 482	Database Management Systems I	3
Select 6 credits from the following: [5]		6
C S 380	Introduction to Cryptography	
C S 381	Principles of Virtual Reality	
C S 382	Modern Web Technologies	
C S 383	Introduction to Deep Learning	
C S 384	Graph Data Mining	
C S 473	Architectural Concepts I	
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 478	Computer Security	
C S 479	Special Topics [6]	
C S 480	Linux System Administration	

C S 481	Visual Programming	
C S 484	Computer Networks I	
C S 485	Human-Centered Computing	
C S 486	Bioinformatics	
C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
C S 489	Bioinformatics Programming	
C S 491	Parallel Programming	
C S 496	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415	Introduction to Linear Algebra	3
or MATH 4230	Applied Linear Algebra	
Select one from the following:		3
MATH 3110	Introduction to Modern Algebra	
MATH 3120	Introduction to Analysis	
MATH 3140	Introduction to Numerical Methods	
MATH 3160	Introduction to Ordinary Differential Equations	
MATH 4320	Logic and Set Theory	
MATH 4330	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Lab Science Courses		
Select one from the following: [5]		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 [7]		**14**
The specific requirements for the concentration in Artificial Intelligence are as follows:		
Select 3-4 credits from the following:		
C S 343	Algorithm Design & Implementation	
C S 372	Data Structures and Algorithms	
Select 9 credits from the following:		
C S 475	Artificial Intelligence I	
C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
Total Credits		**120**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/) section of the catalog for a full list of courses
3. MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.
4. See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of the catalog for a full list of courses.
5. A course can satisfy only one requirement.
6. Must be taken for 3 credits to count as a course.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G and ENGL 1110G . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 273	Machine Programming and Organization	4
ENGL 1110G	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I [1]	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course [2]		3
Area V: Humanities Course [2]		3
	Credits	**30**
Sophomore		
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 372	Data Structures and Algorithms	4
COMM 1115G	Introduction to Communication	3
ENGL 2210G	Professional and Technical Communication Honors	3
MATH 2415 or MATH 4230	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts [2]		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	

Elective credits if needed for financial aid requirements [3]		3+
	Credits	**31-34**
Junior		
C S 371	Software Development	4
C S 471	Programming Language Structure I	3
C S 482	Database Management Systems I	3
Computer Science 400-level Elective [4]		3
MATH elective (upper division) [5]		3
Lab Science Elective [6]		4
Lab Science Elective [6]		4
Viewing a Wider World [7]		3
Viewing a Wider World [7]		3
Elective credits if needed for financial aid requirements [3]		3
	Credits	**33**
Senior		
C S 448 or C S 449	Senior Project or Senior Thesis	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 474	Operating Systems I	3
Lab Science Elective [6]		4
Computer Science 400-level Elective [4]		3
Upper division electives to bring total upper division to 48 [3]		4
Electives as needed to meet minimum credit requirements [3]		7
	Credits	**26**
	Total Credits	**120-123**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
2. See the General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/) section of the catalog for a full list of courses
3. Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration.
   Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. See list of Computer Science electives (p. 1) in Degree Requirement Section.
5. **Math Electives:**
   - MATH 3110 Introduction to Modern Algebra
   - MATH 3120 Introduction to Analysis
   - MATH 3140 Introduction to Numerical Methods
   - MATH 3160 Introduction to Ordinary Differential Equations
   - MATH 4320 Logic and Set Theory
   - MATH 4330 Elementary Number Theory
6. See list of Lab Science (p. 1) courses in the Degree Requirement Section.
7. See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.