

# BS COMPUTER SCIENCE AP + MS COMPUTER SCIENCE

## Program Overview

AP Coordinator	Kaitlin Hoffmann, 845-257-3533, <a href="mailto:hoffmank4@newpaltz.edu">hoffmank4@newpaltz.edu</a>
Program ID	BS Computer Science AP (513A), MS Computer Science (270)
Credits	BS Computer Science AP (69 credits – inclusive of 9-12 GR credits) MS Computer Science (30 credits)
Program Length	The Accelerated Pathway program in Computer Science may be completed in 10 semesters, but students must complete the graduate degree within 7 years.
Modality	In-person
Full-time/Part-time	Full-time or Part-time
Transfer Credits	9-12 graduate credits will be applied to both the BS and MS degree programs.
Graduate Capstone	Comprehensive Exam or Thesis

## Program Description

This accelerated plan of study provides a pathway to earning a master's degree in computer science along with a bachelor's degree in computer science. Students enrolled in the BS/MS program complete 9-12 graduate-level credits during their senior year. These credits are offered at the reduced undergraduate tuition rate and fulfill both undergraduate and graduate program requirements.

The master's degree in computer science is designed to help students from all backgrounds advance to new careers in technology fields. Our mission is to prepare the next generation of application developers, start-up entrepreneurs, and business analysts to thrive in a rapidly changing world. The program focuses on building a strong foundation in the theoretical concepts of computer science, while introducing applicable skills in areas like machine learning, web and database development, cybersecurity, and data science. Courses are taught by dedicated faculty who are experts in their fields with active research programs. Our network and security lab provides advanced computing facilities. The curriculum is constantly evolving in step with current trends in technology, emphasizing the skills that employers – especially in the Hudson Valley's growing tech industries – need right now.

## How does it work?

Get started by declaring the Computer Science AP major (513A) as an undergraduate:

- Meet with AP advisor, Kaitlin Hoffmann, to declare the Computer Science AP major.

## Graduate Admission Requirements

- **Work** with your AP advisor to enroll in three to four graduate computer science courses during your senior year.
- **Apply** for the MS Computer Science program in your senior year.
- **Transfer** 9-12 credits of graduate electives taken as an undergraduate into your graduate program.

## MS Computer Science Admission Requirements

Graduate admission requires submission of:

- Graduate application - select major 270.
- One set of official transcripts for all undergraduate and graduate course work, including a baccalaureate transcript from a regionally accredited institution, indicating at least a 3.0 cumulative grade point average.
- Grades of B or higher in graduate computer science courses taken as a senior.

## Admission Deadlines

Fall Admission	July 31
Spring Admission	January 1

Accepting on a rolling basis until the program is full. However, applications must at least be started by the deadline, or they will not be considered.

## Curriculum Requirements

### BS Computer Science AP (major 513A)

Code	Title	Credits
<b>Required Computer Science courses (40 Credits)</b>		
CPS210	Computer Science I: Foundations	4
CPS310	Computer Science II: Data Structures	4
CPS315	Computer Science III	4
CPS330	Assembly Language and Computer Architecture	4
CPS340	Operating Systems	4
CPS352	Object Oriented Programming	3
CPS353	Software Engineering	3
CPS415	Discrete and Continuous Computer Algorithms	3
CPS425	Language Processing	4

**AP capstone pairing:**

CPS5xx Computer Science Selected Topic + CPS485 Projects	7
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**Required Mathematics Courses (11 Credits)**

MAT251	Calculus I	4
MAT252	Calculus II	4
MAT320	Discrete Mathematics for Computing	3

**Required Science Courses - Select one grouping below (0 Credits) 8**

CHE201	General Chemistry I	
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CHE211	General Chemistry I Lab	
CHE202	General Chemistry II	
CHE212	General Chemistry II Lab	
<b>OR</b>		
PHY201	General Physics 1	
PHY211	Physics 1 Laboratory	
PHY202	General Physics 2	
PHY212	General Physics 2 Lab	
<b>OR</b>		
BIO201	General Biology I	
BIO211	Gen Bio 1 Lab	
BIO202	General Biology II	
BIO212	Gen Bio 2 Lab	
<b>OR</b>		
GLG201	Physical Geology	
GLG211	Physical Geology Laboratory	
Plus, one 4-credit Geology course with GLG201 prereq		
<b>Required Engineering Courses (4 Credits)</b>		
EGC220	Digital Logic Fundamentals	3
EGC221	Digital Logic Lab	1
<b>Graduate Computer Science Electives (6 Credits)</b>		
Select two graduate computer science elective with advisement		6
<b>Total Credits</b>		<b>69</b>

## MS Computer Science (major 270)

Graduate study in Computer Science enables students to individualize their program of study by pursuing ten computer science courses (30 credits) and passing a comprehensive exam or completing eight courses (24 credits) and delving into a 6-credit thesis project. This flexibility allows students to explore conceptually based classes, enhance technical skills through applied learning courses, stay abreast of current trends in the field through a wide range of special topics courses, and engage in research by pursuing an optional six-credit thesis.

### Sample comprehensive exam option

Code	Title	Credits
<b>Transfer Credit (6 Credits)</b>		
Graduate courses taken as an undergraduate.		6

### Individualized Comprehensive Exam Track (24 Credits)

Select 8 courses by advisement		24
CPS502	Discrete Structures	
CPS526	Advanced Data Structures	
CPS530	Computer Networks	
CPS534	Foundations of Computer Science	
CPS536	Machine Learning	
CPS540	Artificial Intelligence	
CPS551	Programming and Data Structures	
CPS553	Web and Database Programming	
CPS554	User Interface Programming	
CPS580	Functional Programming	
CPS593	Computer Science Selected topic *	
CPS594	Fieldwork Comp Science	

Comprehensive Exam

**Total Credits** **30**

\* Recently offered special topics courses include Cybersecurity and Database Management.

### Sample thesis option

Code	Title	Credits
<b>Transfer Credit (6 Credits)</b>		
Graduate courses taken as an undergraduate.		6
<b>Individualized Thesis Track (24 Credits)</b>		
Students select six graduate courses by advisement and complete a 6-credit thesis.		18
CPS502	Discrete Structures	
CPS526	Advanced Data Structures	
CPS530	Computer Networks	
CPS534	Foundations of Computer Science	
CPS536	Machine Learning	
CPS540	Artificial Intelligence	
CPS551	Programming and Data Structures	
CPS553	Web and Database Programming	
CPS554	User Interface Programming	
CPS580	Functional Programming	
CPS593	Computer Science Selected topic *	
CPS594	Fieldwork Comp Science	
CPS590	Thesis in Computer Science	6
<b>Total Credits</b>		<b>30</b>

\* Recently offered special topics courses include Cybersecurity and Database Management.

## Academic Standing Requirements for Accelerated Pathway Students

A cumulative GPA of less than 3.0 in graduate-level courses taken in the undergraduate portion of an accelerated pathway program precludes the student's good standing. Students with a cumulative GPA between 2.75 to 2.99 are strongly advised to reconsider continuing into the graduate program.

## Graduation Checklist

- Apply for graduation via [my.newpaltz.edu#under](http://my.newpaltz.edu#under) "Graduation" tab according to the schedule in the academic calendar.
- Resolve any pending admission conditions (outlined in your acceptance letter) and/or missing documents if applicable.
- Review your progress report via [my.newpaltz.edu](http://my.newpaltz.edu) to ensure that you have completed all program requirements.
- Remember that only two grades below a B- may be applied to your plan of study

- Contact your advisor if you need to amend your plan#or processtransfer credit.
- Ensure that you are ingood academic standing#with a#GPA (Grade Point Average)#of 3.0 or higher.
- Pass your capstone or culminating assessment.
- Complete your degree within thespecified time limit#outlined in the Program Overview.
- Develop the ability to learn new programming languages without formal instruction.
- Design and analyze algorithms.
- Design a new programming language and#write a compiler or interpreter for it.
- Apply object-oriented programming and software engineering#principles.

## BS Computer Science Program Learning Outcomes

Candidates who successfully complete all required components of the BS in Computer Science at SUNY New Paltz will:

- Develop skills in programming in several high-level languages, assembly language, machine language, and microcode.
- Develop the ability to learn new programming languages without formal instruction.
- Design and analyze algorithms.
- Design a new programming language and write a compiler or interpreter for it.
- Apply object-oriented programming and software engineering principles.
- Design and implement digital circuits.
- Understand the structure and operation of a modern operating system.
- Understand theoretical computer science concepts, such as the Turing machines and automata and computability theory.
- Understand the fundamentals of at least one of these laboratory sciences: physics, chemistry, biology, or geology.
- Understand continuous and discrete mathematical structures relevant to computing.

## MS Computer Science Program Learning Outcomes

Candidates who successfully complete all required components of the MS in Computer Science program at SUNY New Paltz will:

- Developskills#in programming in several high-level languages, assembly language, machine language, and microcode.