BS MATHEMATICS AP + MS COMPUTER SCIENCE

Program Overview

AP Coordinator	Kaitlin Hoffmann, 845-257-3533, hoffmank4@newpaltz.edu
Program ID	BS Mathematics AP (512B), MS Computer Science AP (270)
Credits	BS Mathematics AP (59-67 credits – inclusive of 6 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	6 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 mathematics. Students enrolled in the BS/MS program complete 6 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 Mathematics AP major (512B) as an undergraduate:

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

- Work#with your AP advisor to enroll in two graduate computer science courses during your senior year.

- Apply for the MS Computer Science program in your senior year.

- Transfer#6 credits of graduate electives taken as an undergraduate into your graduate program.

Graduate 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

July 31	Fall Admission
January 1	Spring Admission

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 Mathematics AP (major 512B)

Code	Title	Credits
Required Mathematics Courses (36 Credits)		
MAT251	Calculus I	4
MAT252	Calculus II	4
MAT260	Introduction to Proof	3
MAT303	Foundations of Analysis	3
MAT304	Foundations of Algebra	3
MAT353	Calculus III	4
MAT359	Ordinary Differential Equations	3
or MAT341	Applied Mathematics I	
MAT362	Linear Algebra	3
MAT381	Probability and Statistics I	3
MAT431	Real Analysis I	3
MAT441	Abstract Algebra I	3
Elective Courses (9 Credits)		
Select three from the following upper division electives:		9
MAT310	Number Theory	
MAT331	Axiomatic Geometry	
MAT332	Modern Geometry	
MAT342	Applied Mathematics II	
MAT354	Calculus IV	
MAT363	Combinatorics	
MAT375	Numerical Methods	
MAT382	Probability and Statistics II	
MAT393	Math Selected Topic	

MAT432	Real Analysis II	
MAT442	Abstract Algebra II	
MAT483	Actuarial Mathematics	
MAT488	Partial Differential Equations	
MAT490	Research in Mathematics	
MAT493	Math Selected Topic	
MAT495	Indep Study Math	
Required Science Sequence (8 Credits)		
CPS210	Computer Science I: Foundations	4
CPS310	Computer Science II: Data Structures	4
Additional Science Sequence by Advisement (6-8 Credits)		
Select one GE Natural Science sequence:		6-8
BIO201, BIO211, BIO202, BIO212		
CHE201, CHE211, CHE202, CHE212		
GLG201, GLG211, GLG202		
PHY201, PHY211, PHY202, PHY212		
OR, if GE Natural Science is complete, select:		
ECO206, ECO207		
Graduate Computer Science Electives (6 Credits)		
Select two graduate computer science electives with advisement		6
Total Credits		**65-67**

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 track

Code	Title	Credits
Transfer Credit (6 Credits)		
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 track

Code	Title	Credits
Transfer Credit (6 Credits)		
Graduate courses taken as an undergraduate.		6
Individualized Thesis Track (24 Credits)		
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
Total Credits		**30**

* 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 viamy.newpaltz.edu#under "Graduation" tab according to the schedule in theacademic 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 to ensure that you have completed all program requirements.

- Remember that only two grades below a B- may be applied to yourplan 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.

BS Mathematics Program Learning Outcomes

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

- **Computation**

  Students can reliably perform numeric and symbolic computations.

- **Representation**

  Students can construct and apply standard symbolic and graphical representations of mathematical objects.

- **Estimation**

  Students are able to estimate, approximate, and check results for reasonableness.

- **Modeling**

  Students can construct appropriate mathematical models for real-world problems.

- **Communication**

  Students are proficient at oral and written communication of mathematical content.

- **Comprehension**

  Students are able to read and comprehend a mathematical argument, identifying any flaws in its reasoning.

- **Definitions**

  Students can state and apply mathematical definitions and theorems.

- **Proving**

  Students are able to write formal mathematical proofs.

- **Hypothesizing**

  Students are able to use abstraction and generalization to make, test, and revise mathematical hypotheses.

- **Novelty**

  Students can apply their mathematical knowledge to a novel situation.

- **Independence**

  Students are proficient at thinking independently and creatively.

- **Breadth**

  Students are able to use techniques from a number of different fields of mathematics.

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:

- Developskill#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 continuous and discrete mathematical structures relevant to computing.