

# APPLIED MATHEMATICS AND STATISTICS (B.S.) (COMBINED B.S./M.S. APPLIED MATHEMATICS)

Program begins Spring 2022

A Combined Degree program enables undergraduate students to enroll in graduate courses in their senior year, which can be counted towards the completion of both their Bachelor's and Master's degree requirements.

The ability to take these "swing courses" allows students to earn both their Bachelor's and Master's degrees in a shortened period of time, typically within five years of intensive study. Undergraduate students interested in this option can find more information regarding program requirements on the University's Combined Programs website (<https://www.montclair.edu/combined-programs/programs-of-study/>).

120 credits of coursework is required for the baccalaureate degree with a minimum 2.0 overall GPA, and a minimum 2.0 major GPA.

## Program Requirements

Students in this combined degree program must complete the requirements for:

Applied Mathematics and Statistics (B.S.) (<http://catalog.montclair.edu/programs/applied-math-and-statistics-bs/>)

Applied Mathematics (M.S.) (<http://catalog.montclair.edu/programs/applied-mathematics-ms/>)

## Graduate Swing Courses

A combined degree program allows students to complete 6-12 graduate credits ("graduate swing courses") while enrolled as an undergraduate. These courses count for both their bachelor and master's degrees. Graduate swing courses will count toward undergraduate free electives, unless noted otherwise.

The Graduate Swing Courses for this program:

Code	Title	Credits
AMAT 530	Scientific and Numerical Computing I	3
AMAT 532	Applied Linear Algebra	3
AMAT 534	Data-Driven Modeling and Computation	3
AMAT 536	Applied Probability and Stochastic Processes	3

## Recommended Roadmap to Degree(s)

This recommended five-year plan is provided as an outline for students to follow in order to complete their degree requirements within five years. This plan is a recommendation and students should only use it in consultation with their academic advisor.

Fifth year courses are taken at the graduate level, after matriculation into the graduate portion of this combined degree program.

## Applied Mathematics Track

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
GENERAL EDUCATION: (A) New Student Seminar		1
GENERAL EDUCATION: (C1) Writing		3
AMAT 120	Applied Calculus A	4
AMAT 240	Introduction to Linear Algebra	4
CSIT 104	Python Programming I	3
		<b>Credits</b>
		<b>15</b>
<b>Spring</b>		
GENERAL EDUCATION: (C2) Literature		3
GENERAL EDUCATION: (J) Physical Education		1
AMAT 220	Applied Calculus B	4
CSIT 114	Python Programming II	3
STAT 230	Data Science and Statistics	3
		<b>Credits</b>
		<b>14</b>
<b>Second Year</b>		
<b>Fall</b>		
GENERAL EDUCATION: (C3) Communication		3
MATH 222	Calculus III	4
STAT 330	Fundamentals of Modern Statistics I	4
Application Area Sequence course		4
		<b>Credits</b>
		<b>15</b>
<b>Spring</b>		
General Education course		3
World Language 1		3
World Cultures		3
AMAT 345	Applied Probability	3
Application Area Sequence course		4
		<b>Credits</b>
		<b>16</b>
<b>Third Year</b>		
<b>Fall</b>		
General Education course		3
General Education course		3
AMAT 350	Applied Mathematic: I	3
AMAT 360	Numerical Computing	3
Major Elective course		3
		<b>Credits</b>
		<b>15</b>
<b>Spring</b>		
General Education course		3
World Language 2		3
AMAT 356	Mathematic: Modeling	3

2 Applied Mathematics and Statistics (B.S.) (Combined B.S./M.S. Applied Mathematics)

AMAT 368 or AMAT 472	Mathematical Biology I or Dynamics and Bifurcation	3
AMAT 450	Applied Mathematic: II	3
<b>Credits</b>		<b>15</b>
<b>Fourth Year</b>		
<b>Fall</b>		
General Education course		3
AMAT 430	Applied Analysis	3
Free Elective		3
Graduate Swing Course		3
Graduate Swing Course		3
<b>Credits</b>		<b>15</b>
<b>Spring</b>		
General Education course		3
General Education Course		3
AMAT 497 or AMAT 499	Applied Mathematic: Research I or Co- Op in Applied Mathem:	3
Graduate Swing Course		3
Graduate Swing Course		3
<b>Credits</b>		<b>15</b>
<b>Total</b>		<b>120</b>
<b>Credits</b>		

## Statistics Track

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
GENERAL EDUCATION: (A) New Student Seminar		1
GENERAL EDUCATION: (C1) Writing		3
AMAT 120	Applied Calculus A	4
AMAT 240	Introduction to Linear Algebra	4
CSIT 104	Python Programming I	3
<b>Credits</b>		<b>15</b>
<b>Spring</b>		
GENERAL EDUCATION: (C2) Literature		3
GENERAL EDUCATION: (J) Physical Education		1
AMAT 220	Applied Calculus B	4
CSIT 114	Python Programmin II	3
STAT 230	Data Science and Statistics	3
<b>Credits</b>		<b>14</b>

**Second Year**

<b>Fall</b>		
GENERAL EDUCATION: (C3) Communication		3

MATH 222	Calculus III	4
STAT 330	Fundamentals of Modern Statistics I	4
Application Area Sequence course		4
<b>Credits</b>		<b>15</b>
<b>Spring</b>		
General Education Course		
World Languages 1		3
World Cultures		3
AMAT 345	Applied Probability	3
Application Area Sequence course		4
<b>Credits</b>		<b>16</b>
<b>Third Year</b>		
<b>Fall</b>		
General Education course		
General Education course		
AMAT 350	Applied Mathematic: I	3
STAT 341	Statistical Computing	3
Major Elective		3
<b>Credits</b>		<b>15</b>
<b>Spring</b>		
General Education course		
World Language 2		
AMAT 356	Mathematic: Modeling	3
STAT 442	Fundamentals of Modern Statistics II	3
STAT 443	Theory of Statistics	3
<b>Credits</b>		<b>15</b>

<b>Fourth Year</b>		
<b>Fall</b>		
General Education course		
STAT 481	Introduction to Statistical Data Mining	3
Free Elective		3
Graduate Swing Course		3
Graduate Swing Course		3
<b>Credits</b>		<b>15</b>
<b>Spring</b>		
General Education course		
General Education Course		
STAT 497 or STAT 499	Statistical Science Research I or Co- Op in Statistic:	3
Graduate Swing Course		3
Graduate Swing Course		3
<b>Credits</b>		<b>15</b>
<b>Total</b>		<b>120</b>
<b>Credits</b>		

# Mathematics of Finance Track

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
GENERAL EDUCATION: (A) New Student Seminar		1
GENERAL EDUCATION: (C1) Writing		3
AMAT 120	Applied Calculus A	4
AMAT 240	Introduction to Linear Algebra	4
CSIT 104	Python Programming I	3
		<b>Credits 15</b>
<b>Spring</b>		
GENERAL EDUCATION (C2) Literature		3
AMAT 220	Applied Calculus B	4
CSIT 114	Python Programming II	3
STAT 230	Data Science and Statistics	3
Application Area Sequence course		3
		<b>Credits 16</b>
<b>Second Year</b>		
<b>Fall</b>		
GENERAL EDUCATION: (C3) Communication		3
MATH 222	Calculus III	4
STAT 330	Fundamentals of Modern Statistics I	4
Application Area Sequence course		3
		<b>Credits 14</b>
<b>Spring</b>		
General Education course		3
World Language 1		3
World Cultures		3
AMAT 345	Applied Probability	3
Application Area Sequence course		4
		<b>Credits 16</b>
<b>Third Year</b>		
<b>Fall</b>		
General Education course		3
General Education course		3
AMAT 262	Mathematic: of Finance I	3
AMAT 350	Applied Mathematics I	3
AMAT 360 or STAT 341	Numerical Computing or Statistic: Computii	3
		<b>Credits 15</b>
<b>Spring</b>		
General Education course		3
General Education course		3
World Language 2		3

AMAT 356	Mathematical Modeling	3
AMAT 362	Mathematic: of Finance II	3
		<b>Credits 15</b>
<b>Fourth Year</b>		
<b>Fall</b>		
General Education course		3
AMAT 430	Applied Analysis	3
AMAT 460	Mathematic: of Portfolio Theory	3
Graduate Swing Course		3
Graduate Swing Course		3
		<b>Credits 15</b>
<b>Spring</b>		
GENERAL EDUCATION (J) Physical Education		1
General Education course		3
AMAT 497 or AMAT 499	Applied Mathematic: Research I or Co-Op in Applied Mathem:	3
Free Elective		1
Graduate Swing Course		3
Graduate Swing Course		3
		<b>Credits 14</b>
		<b>Total 120</b>
		<b>Credits</b>

# Graduate Year

Course	Title	Credits
<b>Fifth Year</b>		
<b>Fall</b>		
Graduate Elective		3
Graduate Elective		3
Graduate Elective		3
		<b>Credits 9</b>
<b>Spring</b>		
Graduate Elective		3
Graduate Elective		3
Culminating Experience		3
		<b>Credits 9</b>
		<b>Total 18</b>
		<b>Credits</b>