

## Data Science with MS in Applied Mathematics 4+1

### Recommended Five-Year Plan (Fall 2022)

The recommended five-year plan is designed to provide a blueprint for students to complete their degrees within five years. These plans are the recommended sequences of courses. Students must meet with their Major Advisor to develop a more individualized plan to complete their degree. This plan assumes that no developmental courses are required. If developmental courses are needed, students may have additional requirements to fulfill which are not listed in the plan.

**NOTE:** This recommended Five-Year Plan is applicable to students admitted into the major during the 2022-2023 academic year.

To enroll, visit <https://www.ramapo.edu/dmc/4plus1/>

Changes to the traditional four-year plan are noted in **light red**.

First Year					
Fall Semester	HRS	✓	Spring Semester	HRS	✓
Gen Ed: Quantitative Reasoning - MATH 121-Calculus I	4		CMPS 130-Scientific Programming with Python	4	
Gen Ed: INTD 101-First Year Seminar	4		MATH 237-Discrete Structures or MATH 205-Mathematical Structures <b>WI</b>	4	
Gen Ed: CRWT 102-Critical Reading and Writing II	4		Gen Ed: AIID 201-Studies in the Arts & Humanities	4	
DATA 101-Introduction to Data Science	4		Gen Ed: SOSC 110-Social Science Inquiry	4	
			TAS Pathways Module 1: (PATH-TS1)	<b>Degree Rqmt.</b>	
<b>Total:</b>	16		<b>Total:</b>	16	

Second Year					
Fall Semester	HRS	✓	Spring Semester	HRS	✓
CMPS 240-Data Analytics in Python	4		DATA 301-Data Visualization	4	
MATH 262-Linear Algebra <b>WI</b>	4		Minor Requirement*	4	
Gen Ed: Historical Perspectives	4		Gen Ed: Scientific Reasoning	4	
Minor Requirement*	4		Gen Ed: Distribution: Culture and Creativity OR Systems, Sustainability & Society ( <b>Must be outside TAS</b> )	4	
TAS Pathways Module 2: (PATH-TS2)	<b>Degree Rqmt.</b>		TAS Pathways Module 3: (PATH-TS3)	<b>Degree Rqmt.</b>	
<b>Total:</b>	16		<b>Total:</b>	16	

Third Year					
Fall Semester	HRS	✓	Spring Semester	HRS	✓
Gen Ed: Distribution Values and Ethics DATA 225-Ethics of Technology <b>WI</b>	4		MATH 370-Applied Statistics	4	
Gen Ed: Global Awareness	4		CMPS 364-Database Design	4	
Minor Requirement*	4		Minor Requirement*/Elective	4	
Minor Requirement*	4		Elective	4	
<b>Free elective ***</b>	2		<b>Free elective ***</b>	1	
<b>Total:</b>	18		<b>Total:</b>	17	

Fourth Year					
Fall Semester	HRS	✓	Spring Semester	HRS	✓
CMPS 320-Machine Learning	4		DATA 450-Data Science Capstone Project <b>WI</b>	4	
DATA Elective**	4		<b>DATA 620 – Ethics in Data and Computing (MSAM)****</b>	3	
Minor Requirement*/Elective	4		<b>MATH 654 – Applied Probability (MSAM) OR MSAM Category 1 Elective****</b>	3	
<b>MATH 562 - Applied Linear Algebra (MSAM)****</b>	3		Elective	4	
<b>Total:</b>	15		<b>Total:</b>	14	

Fifth Year - MSAM					
Fall Semester	HRS	✓	Spring Semester	HRS	✓
<b>MATH 680 – Advanced Mathematical Modeling</b>	3		<b>MSAM Category 1 Elective or MATH 654 – Applied Probability (MSAM)</b>	3	
<b>MSAM Category 1 Elective</b>	3		<b>MATH 750 - THESIS</b>	3	
<b>MSAM Category 2 Elective</b>	3		<b>MSAM Category 2 Elective</b>	3	
<b>MSAM Category 2 Elective</b>	3				
<b>Total:</b>	12		<b>Total:</b>	9	

**Total Credits Required for undergraduate degree: 128 credits\*\*\*\***

**GPA Required for BS in Data Science: 2.0**

**GPA Required for 4+1 Pathway: 3.0**

**WI:** Writing Intensive-3 required in the major

\* As part of their degree requirements, Data Science majors are also required to complete a minor or double major to gain domain knowledge in a particular field, to better contextualize their data studies. Most minor programs require 5-6 courses. Any minor or second major can be selected: <https://www.ramapo.edu/majors-minors/a-z/>

\*\* DATA elective courses may require pre-requisites outside the program requirements. For example, Math 305 Differential Equations, Math 245 Numerical Analysis, and Math 253 Probability each have Math 122 Calculus II as a pre-requisite. Additionally, Math 253 Probability also allows the option for Math 122 Calculus II to be taken as a co-requisite.

\*\*\*Three additional credits are required in the 3<sup>rd</sup> year because graduate courses are only 3 credits, instead of the usual 4 credits for undergraduate courses. Thus, a student must take an additional 3 credits to meet the 128-credit undergraduate graduation requirement.

**Total Graduate Credits Required: 30 credits\*\*\*\***

**GPA Required for MSAM: 3.0**

\*\*\*\*The 9 credits of graduate coursework taken in the fourth-year will double count towards both the undergraduate degree requirement of 128 credits as well as the required 30 graduate credits.