RAMAPO COLLEGE OF NEW JERSEY

School of Theoretical and Applied Science

Mathematics with MS in Data Science 4+1

Recommended Graduation Plan (Fall 2025)

The recommended graduation 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 Graduation Plan is applicable to students admitted into the major during the 2025-2026 academic year. To enroll, visit https://www.ramapo.edu/data-science/4plus1/

Items labeled [1] through [5] are explained in the footnotes on the bottom of this file.

Course sequences that use developmental courses as prerequisites (*if applicable*):

CRWT Placement
CRWT 101 to CRWT 102
CRWT 101S to CRWT 102S

Math Placement
MATH 021/ 022 to MATH 024 to MATH 110 to MATH 121 MATH 021/022 to MATH 101-108

NOTE: Developmental courses are determined by placement testing and should be taken first. If developmental courses are needed, please follow the sequence above. See the Ramapo College Catalog for a complete list of prerequisites for each course.

First Year					
Fall Semester	**HRS**	**✓**	**Spring Semester**	**HRS**	**✓**
Gen Ed Quantitative Reasoning: MATH 121 - Calculus I [1]	4		CMPS 130 - Scientific Programming with Python or CMPS 147 – Computer Science	4	
Gen Ed: INTD 101 - First Year Seminar	4		General Education Requirement	4	
Gen Ed: CRWT 102 - Critical Reading & Writing II	4		MATH 237 - Discrete Structures **WI** OR MATH 205 - Mathematical Structures **WI**	4	
General Education Requirement	4		MATH 122 - Calculus II	4	
			TAS Pathways Module 1: (PATH TS1) Career Assessment/ Advising	Degree Rqmt.	
Total:	16		**Total:**	16	

Second Year					
Fall Semester	**HRS**	**✓**	**Spring Semester**	**HRS**	**✓**
MATH 225 - Multivariable Calculus	4		MATH 305 – Differential Equations	4	
MATH 262 - Linear Algebra **WI**	4		MATH Elective numbered above 237	4	
Gen Ed Scientific Reasoning and Math Major Requirement: PHYS 116 - Physics I w/ Calculus	4+1		General Education Requirement	4	

Lecture and PHYS 116L - Introductory Physics I Lab					
General Education Requirement	4		General Education Requirement	4	
TAS Pathways Module 2: (PATH TS2) Resume/ CV Writing	Degree Rqmt.		TAS Pathways Module 3: (PATH TS3) Interview Preparation	Degree Rqmt.	
Total:	17		**Total:**	16	

Third Year					
Fall Semester	**HRS**	**✓**	**Spring Semester**	**HRS**	**✓**
MATH 416: Intro to Real Analysis	4		MATH Elective numbered above 237	4	
MATH Elective: Math 370 OR Math 353, not both [2]	4		MATH Elective Level 300 or Above	4	
Free Elective (minor, certificate, or second major requirement)	4		Free Elective (minor, certificate, or second major requirement)	4	
General Education Requirement	4		Free Elective (minor, certificate, or second major requirement)	4	
			Free Elective (minor, certificate, or second major requirement) [3]	2	
Total:	16		**Total:**	18	

Fourth Year					
Fall Semester	**HRS**	**✓**	**Spring Semester**	**HRS**	**✓**
MATH 441 - History of Math WI	4		Free Elective (minor, certificate, or second major requirement)	4	
MATH 432 - Abstract Algebra **WI**	4		Free Elective (minor, certificate, or second major requirement)	4	
DATA 601: Introduction to Data Science (MS)	3		Free Elective (minor, certificate, or second major requirement)	4	
CMPS 530: Python for Data Science	3		DATA 620: Ethics for Data Science (MS)	3	
Total:	14		**Total:**	15	

Fifth Year					
Fall Semester	**HRS**	**✓**	**Spring Semester**	**HRS**	**✓**
MATH 570: Applied Statistics (MS)	3		CMPS 664: Advanced Database and Big Data Systems	3	
MATH 680: Advanced Mathematical Modeling	3		Data Science Elective at 600/700 level	3	
Technical Elective AND/OR Interdisciplinary Elective AND/OR DATA 730 Fieldwork Experience [4]	3 + 3		DATA 750: Data Science Thesis	3	

Total:	12		**Total:**	9	

Total Credits Required for undergraduate degree: 128 credits [5]
GPA Required for BS in Data Science: 2.0
GPA Required for 4+1 Pathway: 3.0
WI: Writing Intensive - 3 courses required in the major.

General Education courses can be done in any order with the exception of INTD 101, CRWT and MATH. Those three general education courses will need to be done first. First Year Seminar is taken in the first semester. Failure to complete CRWT and MATH will result in a hold when the student hits 64 credits. The following general education courses can be done in any order. For more info on these courses, please visit the General Education program requirements website in the College Catalog:

- Social Science Inquiry (SOSC 110) *[+W]*
- Scientific Reasoning
- Historical Perspectives *[+W]*
- Studies in the Arts & Humanities (*CRWT 102 is a prerequisite to this course*) *[+W]*
- Global Awareness *[+W]*
- Distribution Category (Systems, Sustainability, & Society **OR** Culture & Creativity **OR** Values and Ethics) **(Must be outside of TAS)**
- Distribution Category

+W: Students transferring in with 48 or more credits are waived from these general education requirements.

[1] See the course catalog for prerequisites for Calculus I. One of the ways to enter Calculus I is to place into it via the Accuplacer Advanced Algebra and Functions (AAF) placement test at the RCNJ Testing Center. The Testing Center is open all year round. If the placement test results for a given student indicate that developmental courses are required (for instance, Precalculus, or Elementary Algebra Topics followed by Precalculus), such developmental courses may be taken as early as during the summer session(s) preceding the student's freshman year [Summer Session I (late May – late June) or Summer Session II (mid July – mid August)]. See the RCNJ Testing Center website for more details on the AAF test.

Those mathematics majors who end up taking Precalculus, which is a 4-credit-hour course counting towards graduation credits, can count it as, for instance, the 4 HR Elective in the Fourth Year Spring in the table above.

[2] A student in Math 4+1 program must take either Math 353 or Math 370, but not both. Math 353 is a fall course offered only in even years. Math 370 is a spring course. If a student takes both of these two courses, then the one taken earlier will count as a "MATH Elective Level 300 or Above" requirement, but the one taken later will be counted as a general elective, and not as a "Math elective Level 300 or above". Similarly, if a student first takes MATH 237 and later takes MATH 205, then MATH 205 will not count as a math elective, but as a general elective.

[3] Two additional credits are required in the 3rd year because graduate courses are only 3 credits, instead of the usual 4 credits for undergraduate courses. Thus, a student must take an additional 2 credits to meet the 128-credit undergraduate graduation requirement. Note that one additional credit hour is being taken in the fall second year Physics lab.

Total Graduate Credits Required: 30 credits [5]
GPA Required: 2.0
Student must be in good academic standing:
https://www.ramapo.edu/provost/policy/graduate-academic-standing/

[4] Students must complete **two** technical electives and **one** interdisciplinary elective. DATA 730 Fieldwork Experience may be used to replace **one** of the three total electives.

[5] 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.

Important Note:

The following important math courses run once every two years:

Number Theory: will be offered in spring of even years: S26, S28, S30, etc.
Geometry: will be offered in spring of odd years: S27, S29, etc.

Statistics: will be offered in fall of even years: F24, F26, F28, etc.
Analysis: will be offered in fall of even years: F26, F28, F30, etc.

History of Math: will be offered in fall of odd years: F25, F27, F29, etc.
Abstract Algebra: will be offered in fall of odd years: F25, F27, F29, etc.

If you plan on taking any of these six important courses listed above that run once every two years (or if you are required to take any of them), then the following sequencing of these courses is recommended due to the fact that they run once every two years:

If you first became a student at Ramapo College in the academic year whose fall semester is an even year (for example, if you started in Fall 2024 or Spring 2025), then plan for:

Spring of Sophomore Year:
- Number Theory

Spring of Junior Year:
- Geometry

Fall of Junior Year:
- Statistics
- Analysis

Fall of Senior Year:
- Abstract Algebra
- History of Mathematics

If you first became a student at Ramapo College in the academic year whose fall semester is an odd year (for example, if you started in Fall 2025 or Spring 2026), then plan for:

Spring of Sophomore Year:
- Geometry

Spring of Junior Year:
- Number Theory

Fall of Junior Year:
- Abstract Algebra
- History of Mathematics

Fall of Senior Year:
- Statistics
- Analysis