



## Mathematics with MS in Computer Science 4+1

### Recommended Graduation Plan (Fall 2024)

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 2024-2025 academic year.

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

Items labeled [1] through [4] 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 - Sci Problem Solving with Python or CMPS 147 – Computer Science I	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 <b>WI</b> OR MATH 205 - Mathematical Structures <b>WI</b>	4	
General Education Requirement	4		MATH 122 - Calculus II	4	
			TAS Pathways Module 1: (PATH-TS1) Career Assessment/ Advising	<b>Degree Rqmt.</b>	
<b>Total:</b>	16		<b>Total:</b>	16	

Second Year					
Fall Semester	HRS	✓	Spring Semester	HRS	✓

MATH 225 - Multivariable Calculus	4		MATH 305 – Differential Equations	4	
MATH 262 - Linear Algebra <b>WI</b>	4		MATH Elective numbered above 237	4	
Gen Ed Scientific Reasoning and Math Major Requirement: PHYS 116 - Physics I w/ Calculus Lecture and PHYS 116L - Introductory Physics I Lab	4+1		General Education Requirement	4	
General Education Requirement	4		CMPS 148 Computer Science 2 OR CMPS 240 Data Analytics	4	
TAS Pathways Module 2: (PATH-TS2) Resume/CV Writing	<b>Degree Rqmt.</b>		TAS Pathways Module 3: (PATH-TS3) Interview Preparation	<b>Degree Rqmt.</b>	
<b>Total:</b>	17		<b>Total:</b>	16	

Third Year					
Fall Semester	HRS	✓	Spring Semester	HRS	✓
MATH 416 - Introduction to Analysis	4		MATH Elective numbered above 237	4	
MATH Elective 300 Level or Above (possibly Math 353 [2])	4		CMPS 310 - Big Data Programming	4	
General Education Requirement	4		MATH Elective 300 Level or Above	4	
CMPS 231 - Data Structures	4		General Education Requirement	4	
Free Elective (minor, certificate, or second major requirement) [3]	2				
<b>Total:</b>	18		<b>Total:</b>	16	

Fourth Year					
Fall Semester	HRS	✓	Spring Semester	HRS	✓
MATH 441 - History of Math <b>WI</b>	4		CMPS 531 Data Structures and Algorithms	3	
CMPS 547 Foundations of Computer Science	3		MSCS Elective or DATA 620	3	
CMPS 311 - Operating System Design	4		Free Elective (minor, certificate, or second major requirement)	4	
MATH 432 - Abstract Algebra <b>WI</b>	4		Free Elective (minor, certificate, or second major requirement)	4	
<b>Total:</b>	15		<b>Total:</b>	14	

Fifth Year - MSCS					
Fall Semester	HRS	✓	Spring Semester	HRS	✓

MSCS Elective	3		MSCS Elective or DATA 620	3	
MSCS Elective	3		MSCS Elective	3	
MSCS Elective	3		CMPS 750 - THESIS	3	
MSCS Elective	3				
<b>Total:</b>	12		<b>Total:</b>	9	

**Total Credits Required for undergraduate degree:** 128 credits [4]

**GPA Required for BS in Computer 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 Calculus Placement Test called Accuplacer Advanced Algebra and Functions Test (AAF 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 Calculus Placement 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]** If a student wishes to take a statistics course to fulfill one of their "MATH Elective Level 300 or Above" requirements, the student is advised to take exactly one of the following: Math 353 Statistics OR Math 370 Applied Statistics, but not both. 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]** An additional 2-credit elective is required in the 3<sup>rd</sup> year because graduate courses are only 3 credits, instead of the usual 4 for undergraduate courses. Thus, a student must take an additional 2 credits to meet the 128-credit graduation requirement. Note that one additional credit hour is being taken in the fall second year Physics lab.

**Total Graduate Credits Required:** 30 credits [4]  
**GPA Required for MSCS:** 3.0

[4] 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.