RAMAPO COLLEGE OF NEW JERSEY

# Data Science with MS in Computer Science 4+1

Recommended Five-Year Plan (Fall 2023)

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 2023-2024 academic year.

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

Changes to the traditional four-year plan are noted in undergraduate courses taken in order to meet entry requirements, graduate courses taken as an undergraduate, and normal graduate courses

| 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 **WI** | 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) | Degree Rqmt. | |
| **Total:** | 16 | | **Total:** | 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 **WI** | 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 (**Must be outside TAS**) | 4 | |
| TAS Pathways Module 2: (PATH-TS2) | Degree Rqmt. | | TAS Pathways Module 3: (PATH-TS3) | Degree Rqmt. | |
| **Total:** | 16 | | **Total:** | 16 | |

| Third Year | | | | | |
|---|---|---|---|---|---|
| **Fall Semester** | **HRS** | **✓** | **Spring Semester** | **HRS** | **✓** |
| Gen Ed: Distribution Values and Ethics DATA 225-Ethics of Technology **WI** | 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 | | CMPS 231 - Data Structures and Algorithms | 4 | |
| **Free elective \*\*\*** | 2 | | **Free elective \*\*\*** | 1 | |
| **Total:** | 18 | | **Total:** | 17 | |

| Fourth Year | | | | | |
|---|---|---|---|---|---|
| **Fall Semester** | **HRS** | **✓** | **Spring Semester** | **HRS** | **✓** |
| CMPS 320-Machine Learning | 4 | | DATA 450-Data Science Capstone Project **WI** | 4 | |
| CMPS 310 - Big Data Programming[1] (Data Science Elective required for major) | 4 | | CMPS 531 Data Structures and Algorithms | 3 | |
| Minor Requirement*/Elective | 4 | | MSCS Elective or DATA 620 | 3 | |
| CMPS 547 Foundations of Computer Science | 3 | | CMPS 311 - Operating System Design[2] | 4 | |
| **Total:** | 15 | | **Total:** | 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 | | | | |
| **Total:** | 12 | | **Total:** | 9 | |

**Total Credits Required for undergraduate degree:** 128 credits****
**GPA Required for BS in Computer 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/

*** Two additional free electives are required in the 3rd year because graduate courses are only 3 credits, instead of the usual 4 for undergraduate courses.  Thus, a student must take an additional 3 credits to meet the 128-credit graduation requirement.

**Total Graduate Credits Required:** 30 credits****
**GPA Required for MSCS:** 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.