

Computational Mathematics Concentration

B.S. in Mathematical Sciences, Computational Mathematics Concentration

(120 credit minimum)

First Year

1st Semester		Credits
MATH 111	Calculus I	4
CS 100	Roadmap to Computing	3
ENGL 101	English Composition: Introduction to Academic Writing	3
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
FYS SEM	First-Year Student Seminar	0
Term Credits		14

2nd Semester

MATH 112	Calculus II	4
Social Science GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/social-science-ger/)		3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
ENGL 102	English Composition: Introduction to Writing for Research	3
Term Credits		14

Second Year

1st Semester

MATH 213	Calculus III B	4
MATH 333	Probability and Statistics ¹	3
MATH 337	Linear Algebra	3
Select one of the following:		3
PHYS 234	Physics III	
CHEM 125	General Chemistry I	
BIOL 200	Concepts in Biology	
History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)		3
Term Credits		16

2nd Semester

MATH 222	Differential Equations	4
MATH 340	Applied Numerical Methods	3
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
Application Elective		3
Free Elective		3
Term Credits		16

Third Year

1st Semester

MATH 331	Introduction to Partial Differential Equations	3
MATH 391	Numerical Linear Algebra	3
MATH 480	Introductory Mathematical Analysis	3
Application Elective		3
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
Term Credits		15

2nd Semester

MATH 332	Introduction to Functions of a Complex Variable	3
MATH 440	Advanced Applied Numerical Methods	3
Select one of the following:		3
MATH 341	Statistical Methods II	
MATH 344	Regression Analysis	
MATH 447	Applied Time Series Analysis	
MATH 478	Stat Methods in Data Sci	
Application Elective		3
Technical Elective		3
Term Credits		15

Fourth Year**1st Semester**

MATH 448	Stochastic Simulation	3
MATH 450	Methods Of Applied Math	3
Technical Elective		3
Free Elective		3
Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)		3
Term Credits		15

2nd Semester

MATH 451	Methods Appl Math II	3
MATH 453	High-Performance Numerical Computing	3
Math 300+ Elective		3
Technical Elective		3
Free Elective		3
Term Credits		15
Total Credits		120

¹ Students may substitute MATH 244 (<https://catalog.njit.edu/search/?P=MATH%20244>) Introduction to Probability Theory, with advisor approval.

General Education Requirements

All students are required to satisfy the General Education Requirements (GER). All GER courses should be selected in consultation with a faculty advisor in the Department of Mathematical Sciences. Refer to the General Education Requirements (<https://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/>) section of this catalog for further information on electives.

Co-op Courses

In Mathematical Sciences, the co-op courses, MATH 310 (<https://catalog.njit.edu/search/?P=MATH%20310>) Co-op Work Experience I and MATH 410 (<https://catalog.njit.edu/search/?P=MATH%20410>) Co-op Work Experience II, bear degree credit and count as technical or free electives, subject to approval by a faculty advisor in the Department of Mathematical Sciences.

Electives

All mathematics, technical, and free electives should be selected after consultation with a faculty advisor in the Department of Mathematical Sciences. Any mathematics course numbered 331 or above may be used as a mathematics elective. Any course at or above the 100 level having a significant mathematical and/or scientific content may be used as a technical elective. Any course at or above the 100 level may be used as a free elective.

Application Electives

Students are required to take 9 credits of application elective courses in a single area of specialization. Possible areas of specialization for application elective courses include: Biology, Chemistry, Computer Science, Economics/Finance, Physics, Statistics. Students interested in computer science are encouraged to consider the double major program.

This curriculum represents the maximum number of credits per semester for which a student is advised to register. A full-time credit load is 12 credits. First-year students are placed in a curriculum that positions them for success which may result in additional time needed to complete curriculum requirements. Continuing students should consult with their academic advisor to determine the appropriate credit load.