
Applied Mathematics

Applied mathematics is a field that develops and employs a variety of mathematical methods and techniques in order to describe and predict the behavior of systems encountered in science and industry. For example, mathematical and numerical modeling allows engineers to simulate the behavior of many complex systems without having to construct expensive physical models. A degree in applied mathematics appeals to individuals who are interested in applying their mathematical and problem solving skills to real world problems.

There is a need nationally for individuals with rigorous training in applied mathematics, both in industrial and academic settings. Our graduates acquire the necessary mathematical skills to help meet this demand. We are one of three SUNY campuses offering a degree in Applied Mathematics.

People with training in applied mathematics obtain employment in fields as diverse as finance, aerospace, oil exploration and extraction, manufacturing, quality assurance, geology, the actuarial sciences, communications, and computing. They pursue careers in business, industry, government, and academia. Specific job categories include statistician, programmer analyst, cryptographer, reliability analyst, computer modeler, biological systems analyst, and financial analyst.

Depending upon future goals, students may structure their coursework with an emphasis on preparation for graduate school or for more immediate employment. Those who wish to further their study of mathematics may obtain a strong background in the more rigorous and abstract aspects of mathematics. Partial Differential Equations, Real Analysis, Vector and Tensor Calculus, Linear Algebra, and Discrete Mathematics are courses available for students with this interest. For those wishing to pursue careers immediately upon graduation, a rich background in those courses especially suitable to industry may be obtained. Courses supporting this area of study include Mathematical Modeling, Electromagnetism, Numerical Differential Equations, Numerical Linear Algebra, Numerical Computing, Statistics, and Probability.

Students may also work individually with faculty members to pursue special interests outside of our scheduled courses. Students have worked with faculty in areas including fractals and chaos, computational holography, detection and estimation in radar systems, and graph theory.

Students are also encouraged to receive academic credit through our Applied Math internship. This provides interested students the opportunity to work with local companies, putting their mathematics skills to work in applied settings.

Degree Requirements

1. Satisfactory completion of at least 124 semester hours of college-level work.
2. Satisfactory completion of at least 60 semester hours of upper-division college work, at least 30 of which must be taken at SUNYIT.
3. Achievement of at least a "C" cumulative grade point average in all coursework taken at SUNYIT.
4. Satisfactory completion of the Core Mathematics Courses with an average grade of "C" or higher.

I. General Education Requirements (30-56 credits)

Natural Science (Physics I)	3-4
Laboratory Science (Physics II)	3-4
Computer Language	3-4
Computer Science Course	3-4
Mathematics (Calculus I)	3-4
Upper Division Writing	3-4
Basic Communication	3-4
Humanities	3-4
The Arts	2-4
Foreign Language	3-4
Social Sciences	3-4
American History	3-4
Western Civilization	3-4
Other World Civilizations	3-4

II. Physics and Computer Science Courses (12-16 credits)

Physics I & II	6
Computer Science (including one language course)	6

III. Core Mathematics courses (30-40 credits)

MAT 151 Calculus I (Differential Calculus)	4
MAT 152 Calculus II (Integral Calculus)	4
MAT 253 Calculus III (Multivariate Calculus)	4
MAT 230 Differential Equations	4
MAT 340 Linear Algebra	4
MAT 370 Applied Probability	4
MAT 381 Modern Algebra	4
MAT 401 Series and Boundary Value Problems	4
MAT 420 Complex Variables and Their Applications	4
MAT 425 Real Analysis	4

IV. Restricted Elective courses

(2 courses from the following)	
MAT 335 Mathematical Modeling	4
MAT 345 Introduction to Graph Theory	4
MAT 380 Abstract Mathematics: An Introduction	4
PHY 401 Electromagnetism	4
MAT 413 Discrete Mathematics for Computer	4
CSC 420 Numerical Computing	4
PHY 420 Intermediate Mechanics	4
MAT 423 Vector and Tensor Calculus	4
MAT 430 Number Theory & Its Applications	4
MAT 440 Linear Algebra II	4
MAT 450 Partial Differential Equations	4
MAT 460 Numerical Differential Equations	4
MAT 490 Special Topics	4
MAT 491 Independent Study	4
MAT 492 Applied Math Internship	4

V. Unrestricted Electives (Balance of 124 Credits)