

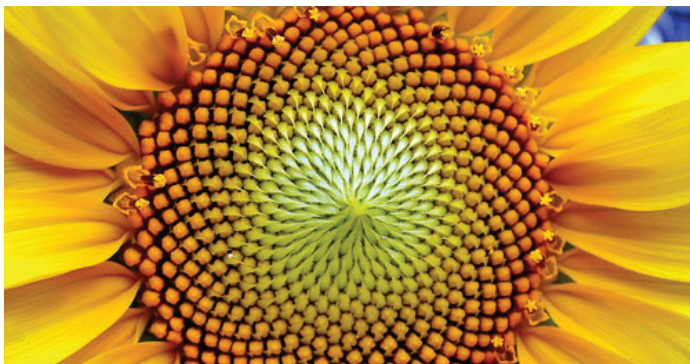
Mathematics & Statistics

www.dms.uaf.edu

Degree Programs

B.A. & B.S. Mathematics

There are three broad areas of study in mathematics: **Algebra** is a language for the symbolic manipulation of not only numbers and polynomials, but more general structures, including geometric transformation. **Analysis** is the study of the infinitely small and large, which underlies the important scientific tools of differential and integral calculus. **Geometry and Topology** considers features of objects and spaces such as curvature or convexity, or more generally concepts of shape that are preserved even when an object is stretched and deformed. These three fundamental areas become intertwined in more specialized areas of pure and applied mathematics, such as probability, combinatorics, number theory, mathematical modeling, differential geometry, and complex analysis. The mathematics major is designed to give students strong foundations, while allowing flexible choices of electives to fit particular goals and career directions. A senior seminar provides a capstone experience in which students actively direct their studies.



M.A.T., M.S., Ph.D. Mathematics

Students in the master's program take courses with either a pure or an applied mathematical emphasis. Students complete advanced mathematics, take a comprehensive exam and complete a project or thesis developed in consultation with the student's graduate advisor. Many projects lead to publications in pure and applied mathematics journals. Masters graduates have gone on to Ph.D. programs and into teaching positions at the two-year college level. The Ph.D. involves working directly with a faculty supervisor preparing for a career in math research and teaching. Students prepare for qualifying exams in three broad areas primarily through directed study. An oral exam ensures breadth and depth in the general area of the student's research field, while the thesis work provides entry into conducting mathematical research. Teaching and research assistantships are available.

B.S., M.S. Statistics

Statistics is a collection of methods and theories for making decisions or estimating unknown quantities from incomplete information. The M.S. program is built around statistical theory and a collection of elective courses that enroll students from a variety of disciplines. The core courses are designed to blend mathematical statistics with real applications, including applied methodology in the natural science research at UAF. Statistics majors are given the opportunity to work with researchers in biology, geology, mathematics and more.

About the Department

The Department of Mathematics & Statistics prepares students for careers in industry, government and education. In addition to the major programs, the department provides a number of service courses in support of other programs within the university.

Research interests in mathematics include algebraic statistics, analysis, combinatorics, computational algebra, control theory, geometric analysis, graph theory, inverse problems, mathematical biology, mathematical physics, mathematics education, numerical analysis, partial differential equations, and optics.

Statistical techniques are useful in estimating plant, animal and mineral abundance; forecasting social, political and economic trends; planning field plot experiments in agriculture; performing clinical trials in medical research; and maintaining quality control in industry. Employment opportunities are excellent for statisticians in many of these areas of application. Research interests in statistics include sampling design, biostatistics, spatial statistics, density estimation, quality control, and design of experiments.



UAF undergraduates Rachel Krieg, Christopher Granade and Seth Chadwick demonstrate a sudoku puzzle they created which won them top honors from more than 1,000 teams participating in a worldwide applied mathematics competition. Photo by Todd Paris, UAF Marketing and Communications

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