

Statistics



College of Science, Engineering and Mathematics
Department of Mathematical Sciences

(907) 474-7332

www.cs.uaf.edu/

Degrees: B.S., M.S.

Minimum Requirements for Degrees: B.S.: 120 credits, M.S.: 30 credits

Statistics is a collection of methods and theories for making decisions or estimating unknown quantities from incomplete information. Statistical techniques are useful, for example, in estimating plant, animal and mineral abundances; 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.

The curriculum for the B.S. degree program in statistics was developed using guidelines proposed by the American Statistical Association and provides graduates with a strong mathematics, computation and statistics background and integrates this with an area of application. The program allows considerable flexibility in the choice of the area of application by requiring a minor in any area offered by UAF.

The M.S. degree program in statistics builds upon UAF's strength in the sciences and our setting in Alaska by introducing a strong quantitative alternative or supplement to existing programs. The curriculum is built around four statistics core courses and flexibility in selection of elective courses. The core courses are designed to blend mathematical statistics coursework typical of most M.S. programs in statistics with real applications. We believe such blending provides a substantial improvement in the graduate's skills. Graduates of this program could be labeled quantitative biologists, biometricians, quantitative geologists, geostatisticians, or mathematical statisticians depending upon their specific coursework. In addition, this program prepares individuals for Ph.D. level work in statistics or their area of application.

The statistics program is administered by the Department of Mathematical Sciences. In addition to the B.S. and M.S. in statistics, the department offers a bachelor's degree in mathematics with an emphasis in statistics. A minor in statistics is also available.

UNDERGRADUATE PROGRAM

MAJOR

Statistics—B.S. Degree

- Complete the following pre-major requirement:
 - Students must be ready to matriculate into MATH 200X before they will be allowed to declare statistics as their major.
- Complete the general university requirements (page 28). (As part of the core curriculum requirements, complete: MATH 200X*. ENGL 314 is recommended to fulfill one of the writing intensive course requirements.)
- Complete the B.S. degree requirements (page 34). (As part of the B.S. degree requirements, complete: MATH 201X*.)
- Complete the following statistics core courses:

MATH 202X—Calculus	4
MATH 314—Linear Algebra	3
MATH 371—Probability	3
MATH 408—Mathematical Statistics	3
STAT 200—Elementary Probability and Statistics (3) or STAT 300—Statistics (3)	3
STAT 401—Regression and Analysis of Variance	4
STAT 402—Scientific Sampling	3
STAT 498—Senior Project	3
- Complete 2 of the following statistics or mathematics electives:

MATH 307—Discrete Mathematics	3
MATH 310—Numerical Analysis	3
MATH 401W—Advanced Calculus	3
MATH 402—Advanced Calculus	3
MATH 460W,O—Mathematical Modeling	3
STAT 461—Applied Multivariate Statistics	3
STAT, MATH or statistical discipline oriented course approved by the statistics program coordinator	3
- Complete 2 of the following computational electives:

CS 103—Introduction to Computer Programming (3) or any higher-level CS course (3)	3
AIS 101—Effective Personal Computer Use	3
NRM 338—Introduction to Geographic Information Systems	3
NRM 341—GIS Analysis	4
- Complete a minor in any discipline in which UAF offers a minor. A mathematics minor is completed by all statistics majors and may be used to meet this requirement.
- Minimum credits required 120

* Student must earn a C grade or better in each course.

Note: A double major in statistics and math may be obtained by completing the following: 2, 3, 4, 5 and 6 above, MATH 215, 308, 401W, 4900 and 9 additional credits in upper division math or statistics. A math elective package is MATH 371 and MATH 408, and STAT 401 and STAT 402 plus 8 credits upper division MATH or STAT. The statistics elective package is MATH 215 and MATH 401W. Minimum credits required is 60 including MATH 200X and MATH 201X. Other double majors are available.



University of Alaska Fairbanks

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MINOR

- 1. Complete the following:
 - STAT 200—Elementary Probability and Statistics (3)
or STAT 300—Statistics (3) 3
 - STAT 401—Regression and Analysis of Variance 4
 - MATH 371—Probability* 3
 - MATH 408—Mathematical Statistics 3
 - MATH, STAT or STAT related coursework** 3
- 2. Minimum credits required 15

*MATH 371 requires MATH 200X, 201X and 202X as prerequisites.

** e.g., BA 360, GEOS 430, ANTH 424, MATH 460W,O, etc.

Note: Courses completed to satisfy this minor can be used to simultaneously satisfy other major or general distribution requirements.

Note: Fisheries majors selecting the research option need only complete MATH 371 and MATH 408 in addition to their fisheries requirements to obtain a minor in statistics.

GRADUATE PROGRAM

Statistics—M.S. Degree

- 1. Complete the following admission requirement:
 - a. Submit three letters of recommendation concerning the applicant’s educational background and quantitative training.
 - b. Submit complete transcripts for all college-level work.
 - c. Submit a resume.
 - d. Submit a written statement of goals.
 - e. Submit GRE scores.
 - f. The applicant must have completed a bachelor’s degree from an accredited institution with a GPA of at least 3.0.
 - g. Must have completed the following courses or their equivalent with a B grade or better: full calculus sequence (MATH 200, 201, 202); or students completing MATH 262 or 272 must take MATH 201 and 202 before acceptance; and a course in linear algebra (MATH 314), at least one introductory statistics or probability course (STAT 200, 300 or MATH 371, 408). Students lacking MATH 314 may be accepted on probation.
- 2. Complete the general university requirements (page 43).
- 3. Complete the master’s degree requirements (page 46).
- 4. Complete the following statistics (core) courses:
 - STAT 651—Statistical Theory I 3
 - STAT 652—Statistical Theory II 4
 - STAT 653—Statistical Theory III—Linear Models 3
 - STAT 654—Statistical Consulting Seminar 1
 - STAT 698—Project 6
- 5. Complete 2 of the following courses:
 - STAT 461—Applied Multivariate Statistics 3
 - STAT 602—Experimental Design 3
 - STAT 605—Spatial Statistics 3
 - STAT 631—Categorical Data analysis 3
 - STAT 661—Sampling Theory 3
 - STAT 611—Time Series 3
- 6. Complete at least 6 credits of approved courses from an application area or courses with substantial statistical and/or mathematical content.*

- 7. Minimum credits required 30

* Examples of courses for specific areas of concentration include: Wildlife WLF 621, 625; Fisheries FISH 601, 602, 621, 622, 625; mathematics MATH 641, 660 or other 600-level MATH course.

Note: Each student must take and pass a three-part comprehensive exam. The first part, written by the statistics faculty, is a written exam (not a take-home exam) covering the material in the core statistics courses. The second part is a take-home exam covering the student’s area of application. The last part is an oral exam covering any material from courses the student has taken along with their project.

