

University of Nevada, Reno

Department of Mathematics and Statistics

Statistics and Data Science M.S. Program

Handbook of Policies and Procedures
for Current Graduate Students

2020-2021

The M.S. Program in Statistics and Data Science at the University of Nevada, Reno is offered by the Department of Mathematics and Statistics. The Department is home of a dynamic group of about 25 graduate faculty with diverse interests and expertise in Probability and Statistics as well as Pure and Applied Mathematics.

Faculty of the DMS are engaged in cutting-edge interdisciplinary research and collaborate with other researchers both locally and at multiple institutions throughout the US and internationally. Graduate students can be part of these exciting activities. UNR and the Reno business community provide ample opportunities for internships, research collaborations, and consulting.

Teaching and

Required Courses

To graduate, students must successfully complete the following six courses:

- STAT 645 - Introduction to Statistical Computing (3 units, offered every fall semester)
- STAT 661 - A First Course in Probability (3 units, offered every semester)
- STAT 667 - Statistical Theory (3 units, offered every semester)
- STAT 755 - Multivariate Data Analysis (3 units, offered every spring semester)
- STAT 757 - Applied Regression Analysis (3 units, offered every fall semester)
- STAT 760 - Statistical Learning (3 units, offered every spring semester)

In addition to the required courses, students following the Thesis Plan, must complete 6 elective and 6 thesis credits; and students following the Non-thesis Plan, must complete 12 elective and 1 comprehensive exam credits.

An internship may be included in the plan of study, subject to availability and approval of the Graduate Director.

Electives

courses outside the Department of Mathematics and Statistics may be approved, depending on the student's plan of study and the approval of the Graduate Director.

- STAT 653 Categorical Data Analysis
- STAT 775 Advanced Topics in Statistics
- STAT 758 Time Series
- MATH 666 Numerical Methods I
- MATH 667 Numerical Methods II

Example electives in other departments:

- ATMS 745 Atmospheric Turbulence
- ATMS 746 Atmospheric Modeling
- BCH 706 Functional Genomics
- BCH 707 Protein Structure and Function
- BCH 709 Bioinformatics
- BIOL 604 Population Genetics
- CS 615 Parallel Computing
- CS 657 Database Management Systems
- CS 677 Analysis of Algorithms
- EE 782 Random Signal Analysis and Estimation Theory
- PHY 732 Statistical Mechanics

The Comprehensive Exam

Students who choose the Non-Thesis Plan must complete the Comprehensive Exam. This exam is offered once every semester, close to the end of semester. The exact date for the exam is announced by the Graduate Director in a timely fashion.

General information

The exam is to evaluate students' fundamental knowledge of probability and statistics. The topics for the exam are a union of the major topics from the Probability (STAT 661) and Mathematical Statistics (STAT 667) courses.

3. Measures of expectation, variation and risk: expected value, geometric mean, median, mean squared and mean absolute error, variance and standard deviation, moments and moment generating function, survival and hazard functions, covariance and correlation, conditional expectation and variance.
4. Special discrete and continuous distributions: Bernoulli, binomial, Poisson, hypergeometric, multinomial, negative binomial, geometric, exponential, gamma, Weibull, beta, uniform, Pareto, univariate and multivariate normal and lognormal distributions.
5. Convergence: Convergence in distribution, convergence in probability, and almost sure convergence; Markov and Chebyshev inequalities; the law of large numbers and the central limit theorem; normal approximation to binomial; Delta Method.
6. Distributions related to the normal: Sample mean and its properties; chi-square, Student t, and F distributions; joint distribution of the sample mean and variance.
7. Estimation: The method of moments; maximum likelihood estimation and its properties; efficiency, consistency, sufficiency, and unbiasedness; small and large sample confidence intervals; information inequality; loss and risk functions; uniformly minimum variance unbiased (UMVU) estimation; Bayesian estimation.
8. Testing hypotheses: Mathematical setup and terminology; power and sample size calculations; p-values; likelihood ratio tests, 1- and 2-sample z- and t-tests; F-test; Kolmogorov-Smirnov test; chi-square tests of goodness-of-fit; contingency tables and tests for homogeneity.
9. Linear models: The method of least squares, linear regression, statistical inference under linear regression model.

The Comprehensive Exam is 6 hours **and is broke**

Students whose cumulative graduate GPA is 0.1 to 0.6 points below that needed for a 3.0 GPA are put on probation. Students are placed on academic probation for one semester. If they fail to raise their cumulative GPA to 3.0 by the end of one semester, they are dismissed from their graduate program. Thesis, dissertation, S/U graded credits, and transfer credits have

Dismissal: students whose cumulative graduate GPA is 0.7 or more grade points below that needed for a 3.0 GPA are dismissed. Dismissed students are no longer in a graduate program but may take graduate-level courses as a Grad Special. Students wishing to complete their degree must obtain approval to take graduate-level courses, raise their graduate GPA to at least 3.0 and then re-apply to a graduate program. Any courses taken to raise their GPA will

Transfer Credits

These are credits transferred from another institution. Credits completed at UNR in another program or as a graduate special do not need to be transferred. Transfer credit is requested on the Graduate Credit Transfer Evaluation Request form available on the Graduate School website: <https://www.unr.edu/grad/student-resources/forms>

The Advisor will instruct the student about the content and format of the thesis. Upon completion, the student will defend thesis by giving a public presentation, followed by a period of questions by the committee.

Students must meet with the Graduate Committee and the Graduate Director (all that sign the Notice of Completion) regarding their availability. It is strongly advised that the student schedules defense no later than 1 week before the start of the semester. Appropriate room for defense. Defense announcements should be sent to the Mathematics and Statistics office for further dissemination.

Students must secure a Thesis Advisor, and a Graduate Committee. The Graduate Committee (Advisory-Examining Committee), chosen in communication between the student and the Advisor, serves as an advisory board to the student, on issues such as class selection, research work, thesis preparation and defense. The student is encouraged to form their committee as early as possible, but not later than the beginning of their 3rd semester.

The Graduate Committee must consist of a minimum of 3 graduate faculty members, at least 2 of whom must be in the student's department. At least 2 faculty members must be in a field related to the student's thesis. The committee must be approved by the Graduate Dean.

Timeline for Degree Completion

Recommended timeline for Thesis Plan

1. Take 6-9 graduate credits per semester. For example, to reach the needed 30 credits for graduation, you may take 9 credits for two semesters and 6 credits for the other two semesters.
2. Identify a Thesis Advisor and Graduate Committee by the end of your 1st year.
3. As early as possible, but no later than the beginning of your 3rd semester in the program, complete the Program of Study form.
4. Complete your thesis by no later than the beginning of your 3rd semester.
5. Complete thesis among members of your Graduate Committee, at least two weeks prior to the thesis defense. In case of a very long or very detailed thesis, committee members may need more time to review your work.
6. Schedule a public defense of your thesis. Consult your Advisor, Graduate Committee members, and the Graduate Director about their time and availability.
7. Upon a successfully defended thesis, file the Notice of Completion with the Graduate School.

Recommended timeline for Non-Thesis Plan

1. Take 6-9 graduate credits per semester. For example, to reach the needed 32 credits for graduation, you may take 9 credits for three semesters and 5 credits during the remaining semester.
2. As early as possible, but no later than the beginning of your 3rd semester in the program, complete the Program of Study form.
3. Schedule the Comprehensive Exam during your second year (3rd or 4th semester) of the program. Enroll in STAT 795, the Comprehensive Exam course.
4. Upon a successfully defended thesis, file the Notice of Completion with the Graduate School.

Forms with deadlines required to be submitted to the Graduate School

Declaration of Advisor/Major Advisor/Committee Chair

Must be submitted to Graduate School several weeks in advance (check web site).

Program of Study

Must be submitted to Graduate School several weeks in advance (check web site).

Graduation Application

Must be submitted to Graduate School several weeks in advance (check web site).

Notice of Completion

Must be submitted after all requirements have been met

Exit Survey

You can find an updated list of forms and requirements here:

<https://www.unr.edu/grad/student-resources/forms>

Graduate Assistantships

Teaching Assistantships award a competitive stipend for the academic year plus a tuition waiver and a subsidized medical plan. Teaching assistants will be expected to perform specific teaching and grading duties. Normally this will not exceed teaching 6 credit hours per semester or the academic equivalent. Awards are based on academic credentials submitted with the graduate school application. Research Assistantships are sometimes available as well. They also provide tuition waiver and a subsidized medical plan.

Students being supported by a TA are expected

teaching or research assistantships) are required to enroll in a minimum of six (6) graduate credits each semester they hold the assistantship.

Leave of Absence

Students in good standing may request a leave of absence by completing a leave of absence form available on the Graduate School website <https://www.unr.edu/grad/student-resources/forms>

During this time, they are not required to maintain continuous registration. Usually, a leave of absence is approved for one or two semesters. The leave of absence request may be extended by the student filing an additional leave of absence form. Students applying for a leave of absence should not have any incomplete grades which could be changed to F and have a detrimental impact on their cumulative GPA. Requests for leave of absences must be