

University of Nevada, Reno

Department of Mathematics and Statistics

**Statistics and Data Science Ph.D. program**

Handbook of Policies and Procedures

for Current Graduate Students

2020-2021

The Ph.D. Program in *Statistics and Data Science* at the University of Nevada Reno is offered by the Department of Mathematics & Statistics (DMS). 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 research assistantships, as well as department and university-wide scholarships, are often available for qualified students. A limited number of competitive stipends that include tuition waiver and a subsidized medical plan are available for students in good academic standing. Students will also have opportunities to apply for external funding, and to participate in grant writing workshops to improve the effectiveness of their application materials.

Located where the Sierra Nevada meets the Great Basin, the University is 45 minutes' drive away from Lake Tahoe, and relatively close to San Francisco Bay Area and the Napa-Sonoma Wine Country. Reno offers an excellent living environment, short commutes, a growing arts community, and an increasingly cosmopolitan flavor. Join us!

**Apply at <https://www.unr.edu/grad/admissions>**

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University of Nevada Reno  
1664 North Virginia Street, Reno, NV 89557  
Web: <http://www.unr.edu/math>  
E-mail: [math@unr.edu](mailto:math@unr.edu)  
Phone: (775) 784-6773

## Program Description

The Ph.D. program in Statistics and Data Science is designed to provide training in fundamental methods and concepts of modern Statistics focused on extracting knowledge from data. The program emphasizes interdisciplinary collaborative research. The program builds research and computational skills that will position students to be competitive in pursuing careers in academic, government, and business environments.

## Student Learning Outcomes

- Develop the advanced theoretical and computational skills necessary to solve applied problems involving data.
- Attain a deep understanding of the theory of statistics and data science sufficient to critically evaluate research done by others.
- Demonstrate the ability to do independent research and to communicate the results of this research, both orally and in writing.
- Acquire breadth of knowledge and the skills necessary to successfully collaborate or consult in a professional setting.

## Questions about the Program

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## Application Process

### Application Requirements

Completion of a bachelor's degree in statistical or mathematical sciences or a related area is required prior to enrollment in the doctoral program.

### Required Documents

- Undergraduate/Graduate Transcripts from previous institutions
- GRE General Test
- TOEFL/IELTS (only required for international students)
- Three (3) letters of recommendation
- Statement of Purpose
- Resume/CV
- Do you request financial support? A graduate support in a form of TA-ship (20h/week) is offered on a competitive basis to graduate students in good academic standing.

## Recommended Documents

GRE Mathematics Subject Test

## Application Target Dates

Feb 1 (priority deadline- best to apply) & March 1 for Fall admission, Oct 1 (priority deadline- best to apply) & Nov 1 for Spring admission. We accept applications throughout the year, however the admission and funding decisions for the main cohorts of students are made after the given target dates. We start decision process on funding after the priority deadlines.

## Web Links

You should apply at UNR Graduate School web site:

<https://www.unr.edu/grad/admissions/how-to-apply>

All applicants must meet the University requirements:

<http://www.unr.edu/grad/admissions>

## Degree Requirements

### Course Work

Candidates for the Doctor of Philosophy degree must satisfy all general requirements of the Graduate School. The following requirements must be met prior to degree granting:

- Minimum of 72 graduate credits
- Minimum of 48 graduate credits of course work
- Minimum of 30 credits of 700-level graduate credits (not counting dissertation)
- Minimum of 24 dissertation credits
- Maximum of 24 graduate credits (including maximum of 18 700-level graduate credits) from a completed master's degree program or previous post-baccalaureate work may be applied to the program, per Graduate Director approval
- All requirements, excluding prerequisite graduate courses, must be completed within 8 years immediately preceding the granting of the degree

### Required Courses

The following courses or their equivalents must be satisfactorily completed for the doctoral degree in Statistics and Data Science:

- MATH 713 Abstract and Real Analysis (3 units)
- STAT 705 Probability Theory (3 units)
- STAT 706 Probability and Measure (3 units)
- STAT 725 Mathematical Statistics I (3 units)

- STAT 726 Mathematical Statistics II (3 units)
- STAT 735 Linear Models I (3 units)
- STAT 736 Linear Models II (3 units) (pending)
- STAT 745 Statistical Computing (3 units)
- STAT 753 Stochastic Models and Simulations (3 units)
- STAT 755 Multivariate Data Analysis (3 units)
- STAT 756 Survival Analysis (3 units)
- STAT 758 Time Series Analysis (3 units)
- STAT 760 Statistical Learning (3 units)
- STAT 799 Dissertation (minimum of 24 units)
- Approved 600/700-level electives, based on research interests (9 units)

## Electives

Electives will be approved by the student's Graduate Advisory Committee. Appropriate courses outside the Department of Mathematics and Statistics may be approved, depending on the student's research interests. Example electives in the Department of Mathematics and Statistics:

- STAT 653 Categorical Data Analysis
- STAT 775 Advanced Topics in Statistics
- MATH 630 Linear Algebra II
- MATH 640 Topology
- MATH 659 Topics in Probability
- MATH 666 Numerical Methods I
- MATH 667 Numerical Methods II
- MATH 714 Real Analysis II
- MATH 794 Research in Mathematical Sciences

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 department is in the process of developing other classes in Mathematics and Statistics that can be used as electives.

## Qualifying Exams

After the first year, and by the end of the third year, every student must pass one written qualifying exam in the theory of Mathematical Statistics (STAT 725/726), and a written qualifying exam in one of the following areas: Qualifying Exam in Probability (STAT 705/706) or Qualifying Exam in Applied Statistics (STAT 735/736). A student will be allowed a maximum of 2 attempts at each of the exams in the first 3 years of the Ph.D. program.

Each exam can be passed at M.S. level (low pass) or Ph.D. level (high pass). To proceed with the Ph.D. program both exams must be passed at the Ph.D. level. If at least one exam is passed at the M.S. level, the student, if the academic record warrants it and the Graduate Committee approves of it, will end her/his program with an M.S. degree in Statistics and Data Science.

### M.S. degree along the way to Ph.D.

Students in the Ph.D. program in Statistics and Data Science may earn an M.S. degree in Mathematics with an emphasis in Statistics along the way to Ph.D., by satisfying the current M.S. degree requirements. Students qualify in the semester in which all degree requirements for the M.S. have been met. Students should apply to graduation using the paperwork required for an M.S. degree and a memo from the Statistics Graduate Program Director.

A maximum of 24 credits (including maximum of 18 700-level courses) used for the master's degree can be applied to a Ph.D. degree, upon approval of the Program Director. The M.S. thesis credits used for an M.S. degree cannot be applied toward a Ph.D. degree. At the same time, the M.S. thesis credits can be counted as Ph.D. dissertation credits (upon Graduate Committee approval) if they have not been used for an M.S. degree.

A maximum of 9 graduate credits earned outside of the program can be applied towards a M.S. Mathematics degree; these credits can be further applied to a Ph.D. degree as part of 24 credits transferred from M.S. to Ph.D. degree (in other words, up to 24 credits can be double-counted, and up to 9 credits can be triple-counted).

Check the Graduate School web site <https://www.unr.edu/grad> for current credit transfer policies.

### Admittance to Ph.D. Candidacy

To be admitted into Ph.D. Candidacy, after successfully completing the first 2-3 years of coursework and passing written qualifying exams, a student must pass an oral exam in the area of specialty. Students will be expected to complete their oral exam by the end of their third year.

The exam is directed by the student's Graduate Advisory Committee. A student is expected to submit a written dissertation proposal to the Graduate Advisory Committee prior to exam. The purpose of the exam is two-fold, serving both as a subject-specific oral exam and defense of a dissertation proposal. It provides students an opportunity to formulate a clear plan for their dissertation research, and to strengthen their background following their written exams and in preparation for conducting their own dissertation research.

## Ph.D. Dissertation

A student will prepare a Ph.D. dissertation supervised by a graduate faculty member in the Mathematics and Statistics department and approved by the student's Graduate Advisory Committee, followed by a public oral presentation. The dissertation is then submitted for the Graduate School and institutional approval.

## Graduate School Academic Requirements

### Cumulative GPA

All graduate students must maintain a cumulative graduate GPA of 3.0. If their GPA drops below 3.0, they are placed on probation or dismissed. Undergraduate courses do not count towards graduate GPA.

### Probation

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 no impact on a student's GPA.

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 be included in the graduate special/ transfer credit limitation (9 credits for master's degrees).

### 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 form must be signed by the student, major advisor, and graduate director. Transfer credits applied to the M.S. program must comply with the time limitation on work (6 years). Thus, if a student took a course five years prior to admission, they would have to complete the degree within one year for the course to apply to the degree. Credits from a completed master's degree will be exempt from the 8-year time limitation for those students earning a doctoral degree.

# Timeline for Degree Completion

## Recommended timeline

- Take 9 graduate credits per semester
- Between second and sixth semesters: Complete written qualifying exams in the theory of Mathematical Statistics and one of the following: Probability or Applied Statistics.
- Second year (third and fourth semesters): Meet with faculty to select potential adviser and make a preliminary selection of the dissertation topic.
- Beginning of the fourth semester: Secure Graduate Advisory Committee.
- Fifth semester: Complete Ph.D. Program of Study form, confirm with adviser, and secure committee signatures. Start working on the dissertation with adviser.
- By the end of the sixth semester: Complete oral exam in the area of specialty.
- Seventh semester: Have a dissertation draft (first chapter is ready, there is a clear plan for the other chapters).
- Eighth semester: Complete dissertation draft, discuss with committee, finalize dissertation according to committee recommendations, present the dissertation.

## Forms with deadlines required to be submitted to the Graduate School

- Declaration of Advisor/Major Advisor/Committee Chair  
For master's students, completed form must be submitted to Graduate School by the end of the student's second semester. For doctoral students, completed form must be submitted to Graduate School by the end of the student's third semester
- Program of Study  
For master's students, completed form must be submitted to Graduate School by the end of the student's third semester. For doctoral students, completed form must be submitted to Graduate School by the end of the student's fourth semester
- (Doctoral Programs only) Doctoral Degree Admission to Candidacy  
For doctoral students who completed all requirements except for the dissertation
- Graduation Application  
Must be submitted to the graduate school several weeks in advance. Check website for exact dates
- Notice of Completion  
Completed form should 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>

## Committee Selection Guidelines

Each student must secure a Ph.D. dissertation committee. The role of the committee is to advise the student during his/her Ph.D. program career on matters including class selection and sequencing, research work, specialty exam, dissertation preparation and defense. The students are encouraged to form their committee as early as possible, but not later than the end of their



fourth semester. The Graduate School requires each student to form the committee by the end of their fourth semester.

The committee must consist of a minimum of five graduate faculty members; the advisor (who will chair the committee), at least two faculty members from the student's major department/program, at least one faculty member from another department in a field related to the student's major, and at least one Graduate School representative. Formal approval of committee is made by the Graduate Dean.

## **Dissertation Requirements**

Each student must prepare a Ph.D. Dissertation guided by his/her advisor. The advisor must be selected from the graduate faculty members of the Department of Mathematics and Statistics. The details of dissertation preparation and presentation should be discussed with adviser. Graduate School forms and resources related to and dissertations:

Thesis and Dissertation Filing Guidelines

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

Ph.D. Thesis Title Form

<https://www.unr.edu/grad/student-resources/filing-guidelines/title-form>

Once all requirements have been met, students need to submit a Final Review Approval (sign-off from the committee chair) and Notice of Completion form in order to graduate. They can be found at <https://www.unr.edu/grad/student-resources/forms>

## **Graduate Assistantships**

Teaching Assistantships award a competitive stipend for the academic year plus a tuition and fee 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.

### **Teaching Assistantships Guidelines**

TA support is normally approved for 8 semesters for students entering with a bachelor's degree and 4 semesters for students with a master's degree, subject to good academic standing and normal degree progress. To get TA support beyond this period requires special semester-by-semester approval of the Graduate Committee.

Students being supported by a TA are expected to enroll in at least 6 credits of approved graduate coursework. The courses Grad 701 and Math 899 do not count toward this 6-credit requirement.

All graduate students holding an assistantship (GTA or GRA) are considered Nevada residents for tuition purposes. Non-resident tuition is only waived for the duration of the assistantship. To be eligible for an assistantship, students must be admitted to a degree-granting program and be in

good academic standing. The student must have an overall GPA of at least 3.0 and must be continuously enrolled in at least 6 graduate level credits (600-700) throughout the duration of the assistantship.

State-funded assistantships (GTA/GRA) may be held for a maximum of three (3) years for master's degree students and five (5) years for doctoral degree students.

## Useful Web Pages

General information:

<http://www.unr.edu/grad/funding/graduate-assistantships>

Graduate Assistantship handbook:

<https://www.unr.edu/grad/admissions/funding/assistantships/graduate-assistant-handbook>

## Health Insurance

All domestic degree seeking graduate students, who are enrolled in six or more credits (regardless of the course level) in a semester, will be automatically enrolled and billed for the University sponsored health insurance for each term they are eligible (fall & spring/summer). If a student has other comparable coverage and would like to waive out of the student health insurance, it is the student's responsibility to complete the University online waiver form prior to the deadline. If approved, a health insurance waiver is good for the current academic year only. A new waiver must be submitted each academic year. All international graduate students must have student health insurance, and the cost is added to the student account. An international graduate student can ask about insurance at the Office of International Students and Scholars. See <http://www.unr.edu/grad/health-insurance>

## Leave of Absence

### Continuous Enrollment

To maintain good standing all graduate students are required to enroll in a minimum of three (3) graduate credits each fall and spring semester until they graduate. International students may be required to enroll in nine graduate credits each fall and spring semester depending on the requirements of their visa. All students holding assistantships (whether 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 received by the Graduate School no later than the last day of enrollment for the semester the leave is to begin.

## Reinstatement

When a student has been absent for one semester or more without an approved leave of absence, he or she may request reinstatement via the Reinstatement Form on the Graduate School website <https://www.unr.edu/grad/student-resources/forms>

This form allows the program the option to recommend the student be re-admitted to their graduate program based on their previous admission or require the student to re-apply for admission. The latter requires students to submit a new application and pay the application fee. The Notice of Reinstatement to Graduate Standing must be received by the Graduate School by the last day of enrollment for the semester when the reinstatement is to begin.

## Graduate Student Association

The Graduate Student Association (GSA) represents all graduate students and promotes the welfare and interests of the graduate students at the University of Nevada, Reno. The GSA works closely with appropriate university administrative offices, including the Graduate School and Student Services and reports to the President of the University. The GSA government functions through the Council of Representatives, Executive Council and established committees. <http://www.unr.edu/gsa/>