School of MATHEMATICAL AND STATISTICAL SCIENCES

GRADUATE STUDENT HANDBOOK: M.S. & Ph.D. in STATISTICS AND DATA SCIENCE

2025-2026

Contents

1 Welcome

We are delighted that you have chosen to pursue our graduate studies (M.S. and/or Ph.D.) in Statistics and Data Science at Clemson University. This handbook is designed to provide information to assist you in succeeding in all areas of your academic experience and to answer some of the most common questions students typically have. While we have tried to cover all of the pertinent information, please feel free to contact us at any time for assistance. The first point of contact is Math and Stat Admin (mathstatadmin@clemson.edu); they will refer you to the best resource for your question. The graduate programs in the School of Mathematical and Statistical Sciences are run by the graduate affairs committee. The committee members for the current academic year are given below:

Committee for Graduate Affairs

(2025-2026) Dr. Qingshan Chen
Dr. Michael Cowen
Dr. Brian Fralix
Dr. Shitao Liu
Dr. Matthew Macauley
Dr. Chris McMahan (chair)
Dr. Shyam Ranganathan
Dr. Brook Russell
Dr. Boshi Yang

1.1 Clemson University

Clemson University was founded in 1889, a legacy of Thomas Green Clemson who willed his Fort Hill plantation to the state of South Carolina to establish a technical and scientific institution. Today, approximately 27,000 students (about 5,500 graduate students) are enrolled at Clemson. As a land-grant University, Clemson is engaged in extensive research, extension, and service activities to the people of South Carolina. You can access the University's website here.

1.2 College of Science

The College of Science at Clemson brings together the fields of mathematics, physical sciences and life sciences to give them additional attention and focus. Our faculty and students are driven by curiosity and the goal of improving the lives of everyone around us. Together, we will maintain a clear focus as we search for the discoveries of the future. You can access the College of Science website here.

1.3 School of Mathematical and Statistical Sciences

Vision: Advance an innovative quest for new knowledge and benefit to society through cutting edge Mathematical and Statistical Sciences research integrated with education.

Mission: We pursue excellence in discovery, engagement, and learning while cultivating academic excellence and interdisciplinary collaboration.

1.3.1 Faculty and Staff

An updated list of the Mathematical and Statistical Sciences Faculty and Staff can be found here.

2 Prospective Students

Clemson's School of Mathematical and Statistical Sciences was one of the pioneers in producing graduate programs which incorporate a wide breadth of mathematical training along with deep content knowledge in an area of specialty into all levels of the graduate program. Students seeking either the M.S. or Ph.D. degree in Statistics and Data Science will gain in depth knowledge in statistics, machine learning, operations research, and computational mathematics. Graduates from our programs are particularly desirable in industrial settings and in research focused jobs. They are also well equipped to teach a wide variety of courses at the undergraduate level upon graduation which increases their market value in the academic sector as well.

If you would like to visit our campus and meet some of our current faculty and students, please contact us and we will be glad to help you arrange an informative and pleasant visit. We can best accommodate visitors who allow us at least two weeks to plan the visit and will do our best to accommodate all visitors.

2.1 Prerequisite Requirements

In general, it is expected that students possess a bachelor's degree in mathematics, statistics, or computer science. In some cases, students from other departments who have an interest and background in mathematics can be admitted into our graduate programs. Any student who desires to complete a Ph.D. in Statistics and Data Science will be required to complete the corresponding M.S. degree en route to the Ph.D.

All students entering the program are expected to have undergraduate prerequisite courses (three semesters of calculus, linear algebra, statistics, probability, and a computer language) and a well prepared students will have other undergraduate foundation courses (modern algebra, advanced calculus).

Typical requirements for admission include a bachelor's degree with at least a 3.4 grade point average. The GRE general test scores are not required.

For international students, a TOEFL score of at least 100 (Internet Based) is required. On occasions, when other factors are considered (such as extremely strong letters of recommendation or extenuating circumstances in the undergraduate record), students may be admitted into the program; their progress in the first semester is then closely monitored by the Associate Director for Graduate Studies.

2.2 Application Information

All application materials must be submitted through the online application system or sent directly to the Office of Graduate Admissions. Accompanying the applications, students must submit the following:

- Transcripts: any applicant will be required to submit the official transcripts from their undergraduate and graduate institutions. The Graduate School policy on transcripts can be accessed on the admissions page.
- Test Scores: The School does not require GRE General Test scores. International students must also submit TOEFL scores. Be sure that your official test scores are sent directly from Educational Testing Services to Clemson. Clemson University's school code is **5111**.
- Letters of Recommendation: Three letters of recommendation are required. You will be asked to submit the names and email addresses of your recommenders on the online application. Your recommenders will receive instruction on submitting their recommendations from the application system.
- Statement (optional): A one page statement of your academic interests can improve your chances for admission. This statement should include your area of interest, career plans, and an indication of why you selected Clemson University.

There is no application fee to apply to graduate programs at Clemson University from Summer 2023 and beyond; more information can be found here. If you are applying for admission in the fall term (which begins in mid-August), it is recommended that you submit your application materials by January 15. If you are applying for the spring term (which begins in early January), submit application materials by October 1. However, completed applications received after these dates may still be considered for admission and financial aid. International applications should check with the International Services for additional deadlines.

The most important criterion for admission is whether a student's background and ability are sufficient to indicate successful completion of the degree program. Selection for financial aid is more competitive than just admission to the School. Additionally the goal of our assistantship program is the development of excellent teachers. International students will be required to pass the Verification of English Skills Test (VEST) in order to maintain any assistantship offered.

2.3 Graduate Student Supervision

The School's Associate Director for Graduate Studies assigns all new graduate students to a temporary curriculum advisor, based on the student's transcript and stated interest areas. This curriculum advisor assists in planning for the first year's courses (fall, spring, and summer), and also serves as a mentor to the student relative to curriculum matters and career choices.

In addition, the student's teaching activities are also monitored by the course coordinator. In this way, feedback concerning effective teaching strategies is provided as well as advice about handling potential classroom problems.

Each fall semester, new graduate students are required to attend a seminar in which faculty members from the School present their research interests and possible topics for master's projects. M.S. students select their advisor and their master's committee by the end of the second semester in the program, at which time the GS2 or GS2-14 form (committee selection and plan of study, see Subsection 7.2) is filed with the Graduate school. The student's M.S. committee is comprised of three faculty members (including their advisor), with at least two of the three members selected from the School of Mathematical and Statistical Sciences. The faculty advisor also serves as mentor for the student's teaching activities during the second year. Classroom visits are scheduled and an on-line teaching evaluation form is submitted by the advisor after each visit.

In addition, faculty serve on the advisory committees that approve each student's curriculum plan and administer the final oral examination on the student's project. Faculty members also serve as the advisors to the different student organizations, helping the student officers gain leadership experience. The School currently has student chapters of the American Mathematical Soceity (AMS), the Associaton for Women in Mathematics (AWM), and the Society for Industrial and Applied Mathematics (SIAM).

3 Master of Science Program

The primary focus of the Master of Science in Statistics and Data Science is to develop industry-valued competencies in students by emphasizing data analysis, statistical computing, and professional skills. Courses are crafted to ensure that students build a strong statistical foundation and develop industry-relevant competencies. Among many areas, students will gain expertise in R, Python, PySpark, PyTorch, SAS, and other essential applications. Graduates of this program will be well-prepared for careers as data scientists, data analysts, and data engineers in diverse industries such as banking, sports, healthcare, government, and technology. To complete the program, students are required to take courses that meet the core and elective requirements. They must also complete and present a project. Details about these requirements are outlined below.

To complete this program, students are required to take courses satisfying the core requirements (24 hours) and the elective component (12 hours). Students must also complete and present a project. Details about these requirements are outlined below.

3.1 Core Requirement

The M.S. core requirements consist of 8 graduate courses: MATH 8000, 8040, 8050, 8830, 8850, 8860, 8710, 8720. It is strongly suggested that students take these courses according to the schedule outlined below. Any deviation from this schedule should be approved of by the Associate Director for Graduate Studies and the student's advisor.

Term	Suggested Courses
Term 1-Fall	MATH 8000, 8050, 8830
Term 2-Spring	MATH 8040, 8850, 8860
Term 3-Fall	MATH 8710, elective, elective
Term 4-Spring	MATH 8720, elective, elective, 8920

3.2 Elective Requirement

The M.S. elective requirements consist of 4 graduate courses, which can be selected from the following list: MATH 8010, 8020, 8060, 8070, 8080, 8090, 8100, 8110, 8810, 8820, 8840, 9010, and 9020. It is highly suggested that terminal M.S. students take 8060, 8090, 8820, 8840, and 9040.

3.3 Research and Dissemination of Results

As a means of integrating the student's program of diverse study, a master's disquisition (project) must be completed by the end of the second year. The student makes an oral and written presentation of the master's degree disquisition. The project does not typically contain original research. Instead, it usually presents a review of relevant literature the student has studied or an application of previously proposed methodologies to new applications.

Instructions for arranging the master's project presentation are here. Students must be complete the steps described there no later than 2 weeks before the defense. Math and Stat Admin will create an announcement and complete the GS7M form (students do not fill out the form themselves).

3.4 Research Hours Policy

M.S. students who are completing a master's project should register for one hour of MATH 8920 during their last semester in the program.

3.5 Program Timeline

The M.S. degree requires 37 course credits. Students are expected to complete the M.S. degree in two (2) years. A typical timeline for a student in the M.S. program is as follows:

Semester 1

- Focus on finishing three core courses and attend first year seminar (fall semester only).
- International students should enroll in our language improvement course and work toward passing the Verification of English Skills Test (VEST).

Semester 2

- Focus on finishing three core courses.
- Students who are supported as TAs should participate in the School's teacher training course (spring semester only).
- Choose a research advisor.
- Work with your advisor to identify a research committee (two more faculty members) and submit a committee selection form via iROAR.
- Ideally students will identify their research projects and get started with research at the end of the second semester.

Semester 3

- Work with your research advisor to complete a plan of study and submit the GS2 or GS2-14 form via iROAR early in the third semester. See Subsection 7.2.
- Students should make significant progress on their research projects by the end of the third semester.
- This is typically when those on TA support begin their teaching responsibilities.

Semester 4

- There are many things to complete this semester before you graduate. Be sure to check the graduate school deadlines for thesis defenses and graduation applications.
- Complete and write up your research project.
- Defend the project. The defense will need to be scheduled through Math and Stat Admin (mathstatadmin@clemson.edu).

4 Doctor of Philosophy (Ph.D.) Program

The Ph.D. in Statistics and Data Science offers comprehensive training in both theoretical and methodological aspects of statistics and data science, with a focus on applying these principles to diverse real-world problems. The program multi-discipline in nature providing training that spans the areas of statistics, machine learning, operations research, and computational mathematics. Graduates of the PhD program are well-prepared for careers as university faculty and researchers, as well as for roles as research statisticians and data scientists in industry, government, and the non-profit sector.

Students admitted to this program must complete the M.S. in Statistics and Data Science en route, regardless of prior education. Beyond the M.S., there are 4 requirements in the Ph.D. program: the preliminary exams, coursework requirement, comprehensive exam, and dissertation. Details of these requirements are outlined below.

4.1 Preliminary Exams

The first priority of a beginning Ph.D. student is to pass the preliminary exams, also called the "prelim exams" or simply the "prelims." These exams comprise the first half of the university's candidacy examination; the second half is the comprehensive exam. As such, students must pass the prelims before attempting the comprehensive exam.

Preliminary Exams are graded Pass/Fail. Graduate students in this track are required to pass the preliminary exams in both statistics and applied statistics. Students will be given two attempts at passing these exams. The first attempt will be in August after their first year, at which point students must attempt both exams. Students who do not complete the preliminary exam requirement on their first attempt will be given a second attempt in January in their second year, and they need only take the exam(s) they failed on the first attempt. M.S. students are allowed to take prelims and all passes and fails will count towards their progress. Any prelims taken by a graduate student become part of their permanent prelim record.

A no-show will count as a Fail if a student signed up and did not withdraw by the specific withdrawal deadline (set by the Associate Director for Graduate Studies) unless there are unusual circumstances such as a medical excuse, a family emergency, etc. An exception to the no-show fail policy can only be made if a written request is approved by the Associate Director for Graduate Studies.

Listed below are the examination areas and the preparatory coursework for each exam. These courses are required, and students are strongly encouraged to take these course before attempting the preliminary exams. Student can also view past exams and syllabi here.

Prelim Exam Area	Curriculum
Applied Statistics	MATH 8050, 8850
Statistics	MATH 8000, 8040

The exams are offered in August and January of each year; here is how to sign up. Before each exam, the Student Services Coordinator will distribute anonymous, randomly generated prelim id numbers for students to use on the exams. This is to protect student anonymity during the grading process. As such, these numbers will only be shared with the student and the Associate Director for Graduate Studies, and they will be changed each semester.

The exams consist of 4-hour in-person exams only. The exams are mostly closed book and closed notes; exceptions will be communicated in advance of the exam. Students are typically notified of their scores a few weeks after the exams by the Student Services Coordinator.

Students who fail to complete the preliminary exam requirement within the allotted time may petition for an extra attempt. The petition should be submitted in writing to the Associate Director for Graduate Studies and should specify the student's plan for success: a description of what the student will do differently from previous attempts to ensure a positive outcome.

4.2 Ph.D. Coursework

The coursework of a Ph.D. student must include at least 24 hours of non-research, non-professional development graduate courses at the 8000 level or above. Courses taken in order to fulfill another degree may not be counted. Courses taken outside of the core requirement (see below) should come from the following list: MATH 8020, 8060, 8070, 8080, 8090, 9010, and 9020. Exceptions to this policy may be granted in special circumstances and by approval of the Advisor and Associate Director for Graduate Studies. The Ph.D. coursework should also include at least 18 hours of Math 9910 (dissertation research).

4.3 Core Requirements

The Ph.D. core requirements consist of 16 graduate courses: MATH 8000, 8010, 8040, 8050, 8100, 8110, 8810, 8820, 8840, 8850, 8830, 8860, 8710, 8720, 8730, 8750. Note, the majority of these courses will be taken to obtain the M.S. en route. It is strongly suggested that students take these courses according to the schedule outlined below. Any deviation from this schedule should be approved of by the Associate Director for Graduate Studies and the student's advisor.

Term	Suggested Courses
Term 1-Fall	MATH 8000, 8050, 8830
Term 2-Spring	MATH 8040, 8850, 8860
Term 3-Fall	MATH 8710, 8010, 8100
Term 4-Spring	MATH 8720, 8110, elective, 8920
Term 5-Fall	MATH 8730, 8810, 8840
Term 6-Spring	MATH 8750, 8820, elective
Term 7-Fall	MATH elective, 9910, 9910
Term 8-Spring	MATH elective, 9910, 9910
Term 9-Fall	MATH 9910, 9910, 9910
Term 10-Spring	MATH 9910, 9910, 9910

4.4 Comprehensive Oral Examinations

Within one year of completing the preliminary examinations, a Ph.D. student must complete a comprehensive oral examination (sometimes called the "third" or "fourth" exam). This exam comprises the second half of the university's candidacy examination; the first half is composed of the prelim exams discussed in Subsection 4.1 above. As such, students may only attempt the comprehensive exam after passing the prelims.

The comprehensive exam is administered by the student's dissertation committee. This oral examination is designed to demonstrate the student's readiness to begin their Ph.D. research. Upon successfully passing the comprehensive exam, the student advances to candidacy for the Ph.D. degree.

Instructions for arranging the comprehensive oral examination are here. Students must complete the steps described there no later than 2 weeks before the exam. Math and Stat Admin will create an announcement and complete the GS5D form and research plan approval form (students do not fill out these forms themselves).

4.5 Research and Dissemination of Results

The final requirement of the Ph.D. degree is the Ph.D. dissertation. Ph.D. students are required to write a Ph.D. dissertation detailing their original and significant contributions to the body of research in their area of concentration and defend it. The Graduate School has compiled an overview for theses and dissertations.

Instructions for arranging the Ph.D. dissertation defense are here. Students must complete the steps described there no later than 2 weeks before the defense. Math and Stat Admin will create an announcement and complete the GS7D form (students do not fill out the GS7D form themselves).

Note that students will also need to submit their completed thesis or dissertation electronically for format approval. Visit the Graduate School's website for the deadlines.

4.6 Research Hours Policy

Ph.D. students begin the program with an allowance of 0 research hrs/semester. As students demonstrate maturity by passing milestones in the Ph.D. program this allowance is increased as follows:

- When a student completes their M.S., their research hour allowance is increased by three hours per semester.
- When a student completes the two required prelims, their research hours allowance is increased by three hours per semester.
- When a student completes the Ph.D. core requirement, their research hours allowance is increased by three hours per semester.

4.7 Program Timeline

4.7.1 Ph.D. Program Timeline

Students in the Ph.D. program are expected to complete the Ph.D. degree in five years with the possibility of a sixth year assuming sufficient academic progress. A typical timeline for a Ph.D. student is as follows:

Year 1

- Focus on completing coursework related to prelim exams.
- Attempt a prelims at the end of this year.
- Attend a graduate student seminar and research seminar each week.

Year 2

- Complete all prelims during this year.
- Choose a research advisor during this year as well.
- Complete a GS2 committee selection form via iRoar. See Subsubsection 7.3.1.
- Attend a graduate student seminar and research seminar each week.

Year 3

- Begin working on research projects and develop a prospectus for your dissertation in consultation with your research advisor.
- Submit a GS2 Ph.D. coursework form via iRoar. See Subsubsection 7.3.1
- Complete your comprehensive oral exam during this year.
- Complete the Ph.D. core requirement.
- Attend a graduate student seminar and research seminar each week.

Year 4

- Focus on your research and topics coursework in your area of specialty.
- Attend a graduate student seminar and research seminar each week.

Year 5 (and possibly 6)

- Attend a graduate student seminar and research seminar each week.
- Make sure to double check the Graduate School deadlines for graduation.
- Complete and defend your dissertation.

4.7.2 Time Limit

All requirements for the doctoral degree must be completed within eight (8) years from the date you first matriculate into a doctoral degree program at Clemson. The time limit applies to all doctoral programs, even cases where a student is receiving a master's degree en route to the doctorate. This clock does not stop for leave of absence. . . . In exceptional circumstances, a student may petition the Graduate School for additional time with approval of the advisory committee. A student who exceeds the time limit without an extension can be dismissed from the Graduate School for failure to maintain adequate academic progress. (From the Graduate School Policies & Procedures Handbook.)

To petition the Graduate School for additional time, the student should work with their research advisor and the Associate Director for Graduate Studies to develop a plan for success: a description of what the student will do to ensure a positive outcome in the coming semester. Petitions should only be made if the student has passed the comprehensive exam.

5 Tuition and Financial Aid

5.1 Tuition and Fees

For additional information on tuition and fees see the Tuition and Fee Calculator on the Student Financial Services website. Note that our program fees are classified as Tier 2 fees.

5.2 Assistantships and Fellowships

All incoming students will be considered for School assistantship support which includes tuition remission (fees are still charged) and a stipend. Assistantships involve instructing or assisting in the instruction of a maximum of 10 credit hours per year. These assistantships consist of $25,000 stipends during the normal 9 month academic year and up to $5,000 during the summer subject to availability. By acheiveing certain milestones, Ph.D. students can increase their 9-month stipend to $26,000 as determined by the following.

Base stipend	$25,000
Pass preliminary exam requirement 4.1	+$500
Pass comprehensive exam requirement 4.4	+$500

The stipend increases for completing the preliminary or comprehensive exam requirement will go into effect the semester after completion of said requirement. Teaching assistants also receive a substantial tuition reduction. For eligibility, enrollment, and other information on Clemson's graduate assistantship policies, visit here.

6 Course Descriptions

Below is a brief description of both the core and elective courses.

MATH 8000: Probability	Basic probability theory with emphasis on results and techniques useful in operations research and statistics; axiomatic probability, advanced combinatorial probability, conditional informative expectation, functions of random variables, moment generating functions, distribution theory and limit theorems. Prerequisite: MATH 2060
MATH 8010: General Linear Hypothesis I	Least-square estimates; Gauss-Markov theorem; confidence ellipsoids and confidence intervals for estimable functions; tests of hypotheses; one-, two-, and higher-way layouts; analysis of variance for other models. Prerequisites: MATH 4030/6030 and 3110
MATH 8020: General Linear Hypothesis II	Continuation of MATH 8010. Prerequisite: MATH 8010
MATH 8040: Statistical Inference	Sampling distributions; maximum likelihood estimation and likelihood ratio tests; asymptotic confidence intervals for Binomial, Poisson and Exponential parameters; two sample methods; nonparametric tests; ANOVA; regression and model building. Prerequisite: MATH 4000/6000 or equivalent or permission of instructor.
MATH 8050: Data Analysis	Methodology in analysis of statistical data emphasizing applications to real problems using computer-oriented techniques: computer plots, transformations, criteria for selecting variables, error analysis, multiple and stepwise regression, analysis of residuals, model building in time series and ANOVA problems, jackknife and random subsampling, multidimensional scaling, clustering. Prerequisites: MATH 3010 and 4000/6000, or MATH 4010/6010 and 8000.
MATH 8060: Nonparametric Statistics	Order statistics; tolerance limits; rank-order statistics; Kolmogorov-Smirnov one-sample statistics; Chi-square goodness-of-fit test; two-sample problem; linear rank statistics; asymptotic relative efficiency. Prerequisite: MATH 6000 or 8000.
MATH 8070: Applied Multivariate Analysis	Applied multivariate analysis: computer plots of multivariate observations; multidimensional scaling; multivariate tests of means, covariances and equality of distributions; univariate and multivariate regressions and their comparisons; MANOVA; principle components analysis; factor analysis; analytic rotations; canonical correlations. Prerequisites: MATH 4030/6030 and 8050 or permission of instructor.
MATH 8080: Reliability and Life Testing	Probability models and statistical methods relevant to parametric and nonparametric analysis of reliability and life testing data. Prerequisites: MATH 4000/6000 and 4010/6010 or equivalent.
MATH 8090: Time Series Analysis, Forecasting and Control	Modeling and forecasting random processes; autocorrelation functions and spectral densities; model identification, estimation and diagnostic checking; transfer function models; feedforward and feedback control schemes. Prerequisites: MATH 6000 and 6050, or MATH 8000 and 6050 or equivalent.
MATH 8100: Mathematical Programming	Formulation and solution of linear programming models; mathematical development of the simplex method; revised simplex method; duality; sensitivity analysis; parametric programming, implementation, software packages. Prerequisite: MATH 3110
MATH 8110: Nonlinear Programming	Theoretical development of nonlinear optimization with applications; classical optimization; convex and concave functions; separable programming; quadratic programming; gradient methods. Prerequisites: MATH 4400 and 4540

MATH 8710: Machine Learning I	Machine learning studies statistical models and associated algorithms used to perform tasks automatically with limited human instructions. This course is the first of a two-semester sequence on machine learning. This course introduces the basics on machine learning models, related optimization algorithms, and their applications.
MATH 8720: Machine Learning II	Machine learning studies statistical models and associated algorithms used to perform tasks automatically with limited human instructions. This course is the second in a two-semester sequence on machine learning. This course covers recent advances on machine learning, including statistical models, learning theory, optimization algorithms, and their applications. Preq: MATH 8710 or consent of instructor.
MATH 8730: Mathematical Foundations of Machine Learning I	Machine learning studies statistical models and associated algorithms used to perform tasks automatically with limited human instructions. This course is the first of a two-semester sequence on the mathematical theory associated with various machine learning algorithms. The goal is to provide a foundational understanding of machine learning by introducing key theoretical concepts and algorithms under the Probably Approximately Correct (PAC) learning model.
MATH 8750: Mathematical Foundations of Machine Learning I	Machine learning studies statistical models and associated algorithms that are used to perform tasks automatically with limited human instructions. This course is the second of a two-semester sequence on the mathematical theory associated with various machine learning algorithms. The goal is to provide a foundational understanding of machine learning by introducing key theoretical concepts and algorithms for deep learning.
MATH 8810: Mathematical Statistics	Fundamental concepts of sufficiency, hypothesis testing and estimation; robust estimation; resampling (jackknife, bootstrap, etc.) methods; asymptotic theory; two-stage and sequential sampling problems; ranking and selection procedures. Prerequisite: MATH 4030/6030 or equivalent.
MATH 8820: Introduction to Bayesian Statistics	Selective course focused on Bayes theorem, conjugate priors, posterior distributions, credible intervals, Monte Carlo approximations, Markov chain Monte Carlo (MCMC) methods, Gibbs sampling, Metropolis-Hastings algorithm, Bayesian hypothesis testing, hierarchical modeling, linear regression, and logistic regression. Students are expected to have completed a course in introductory probability and a course in introductory statistics, and have some experience with the software R before enrolling in this course.
MATH: 8830: Statistical Programming	This course provides a practical introduction to statistical programming with a focus on common statistical languages (e.g., R, python, SAS), equipping students with essential computational tools for data science. It covers both basic and advanced programming techniques necessary for the development and implementation of modern computational methods. Students engage with real data examples to tackle programming challenges across various stages of statistical analysis, from data collection, aggregation, and cleaning to visualization, exploratory analysis, model building, and evaluation. Emphasis is placed on modern programming practices, including source control, collaborative coding, reproducible workflows, and distributed/multicore computing.

MATH 8840: Statistics for Experimenters	Statistical methods for students who are conducting experiments; introduction to descriptive statistics, estimation, and hypothesis testing as they relate to design of experiments; higher-order layouts, factorial and fractional factorial designs, and response surface models. Fall semester only. Prerequisite: MATH 2060 or equivalent.
MATH 8850: Advanced Data Analysis	Continuation of MATH 8050, covering alternatives to ordinary least squares, influence and diagnostic considerations, robustness, special statistical computation methods. Prerequisites: MATH 6030, 8000 and 8050.
MATH: 8860: Computational Methods for Statistical Learning	Computational techniques based on simulation have now become an essential part of the statistician/data scientist's toolbox. This course covers topics needed to develop a broad working knowledge of modern computational statistics. Students develop a practical understanding of how and why existing methods work, enabling effective use of modern statistical methods. Achieving these goals requires familiarity with diverse topics in statistical computing, computational statistics, computer science, and numerical analysis.
MATH 9010: Probability Theory I	Axiomatic theory of probability; distribution functions; expectation; Cartesian product of infinitely many probability spaces, and the Kolmogorov consistency theorem; models of convergence; weak and strong laws of large numbers. Prerequisite: MATH 4000/8000 and 8220 or consent of instructor.
MATH 9020: Probability Theory II	Continuation of MATH 9010; characteristic functions, infinitely divisible distributions, central limit theorems, laws of large numbers, conditioning, and limit properties of sums of dependent random variables, conditioning, martingales. Prerequisite: MATH 9010.
MATH 9040: Computer Experiments and Uncertainty Quantification	The purpose of this course is to introduce classic and recent methodological developments in experimental design, statistical modeling, and uncertainty quantification of computer experiments. This course covers response surface analysis, Gaussian process modeling, Bayesian optimization, space-filling designs, sensitivity analysis, and statistical calibration. Prerequisite: Students are expected to have completed a graduate-level course in linear regression before enrolling in this course.
MATH 9810: Selected Topics in Mathematical Statistics and Probability	Advanced topics in mathematical statistics and probability of current interest. May be repeated for credit, but only if different topics are covered.

6.1 Colloquia, Seminars, and Organizations

The School holds regular seminars and special colloquia each semester. These seminars are given by both students and professors and are a great way for students to interact with faculty and learn more about other research areas. Visit here for a current list of seminars and colloquia offered by the School.

The School also has active American Mathematical Society (AMS), Associate for Women in Mathematics (AWM, clemsonawm@g.clemson.edu), and Society for Industrial and Applied Mathematics (SIAM, siam@g.clemson.edu) chapters as well as a Graduate Student Seminar (GSS). Additionally, the School's Graduate Student Advisory Council (GSAC, smssgsac@g.clemson.edu)) works to maintain and improve communication between the School's graduate student body and the School's administration, e.g., bringing concerns to the Associate Director for Graduate Studies, and sharing updates to fellow students.

6.2 Conferences

Graduate students are encouraged to travel to research conferences in their area of specialty as often as possible. The School provides some limited financial support for such travel which can be requested by completing a Graduate Travel Request form.

7 Academic Policies

Please consult the Graduate School Policy Handbook and the Graduate Catalog for an up-to-date account of University Policies. All policies in this handbook should be viewed as additional policies of the School of Mathematical and Statistical Sciences. In the event that any policy in this handbook conflicts with the policies of Clemson University or of the Graduate School of Clemson University, the policies of the Graduate School and of the University will be given deference.

7.1 Class Schedule

The School has a long range course plan & list of recent course offerings to help students plan ahead.

7.2 Master's Forms and Advising

All M.S. students must form an advisory committee who will supervise progress, approve degree curriculum, and initiate recommendation for degree. M.S. students must form their committee no later than the middle of their second semester.

7.2.1 GS2 Form

The GS2 form is a map of your course of study and advising. Masters students must select an advisor and submit a GS2 Plan of Study form by the middle of their second semester. The form is submitted via iROAR. More information regarding the form can be found in the Graduate School Policies & Procedures Handbook and here. Students must submit the GS2 form before the deadline listed below in Subsection 7.4. This form is different from the GS2-14 form. It should only be used by M.S. students who do not plan to continue to the Ph.D.

7.2.2 GS2-14 Form (M.S. En Route to Ph.D.)

Students who are enrolled in the Ph.D. program and who plan to complete or have completed the requirements for a master's degree in the Mathematics department need to fill out the GS2-14 form. This form is the "Master's en route to Ph.D. Degree Curriculum" and can be found here. This form is different from the GS2 form and the GS14 form. It should only be used for the M.S. en route to the Ph.D. Students should only list the 30–31 credits of coursework required for the degree on this form.

Students must submit the GS2-14 form before the deadline listed below in Subsection 7.4. Contact Math and Stat Admin (mathstatadmin@clemson.edu) with any questions about this form.

7.2.3 GS7M Form

Graduating M.S. students arrange for a GS7M form to be submitted to the Graduate School for final exam and thesis approval. Instructions for arranging this are here. Students must be complete the steps described there no later than 2 weeks before the exam. Math and Stat Admin will then complete the GS7M form.

7.3 Ph.D. Forms and Advising

All Ph.D. students must form an advisory committee who will supervise progress, approve degree curriculum, administer the final oral examination, and initiate recommendation for degree. Students must form this committee by the beginning of their fourth semester after entering the Ph.D. program.

7.3.1 GS2 Form

The GS2 form is a map of your course of study and advising. Ph.D. students must select an advisor and submit a GS2 Plan of Study form by the middle of their second semester. The form is submitted via iROAR. More information regarding the form can be found in the Graduate School Policies & Procedures Handbook and here. Students must submit the GS2 form before the deadline listed below in Subsection 7.4.

7.3.2 GS5D Form

Results of the comprehensive exam required by the graduate school will be reported to the Office of Enrolled Student Services via the GS5D form and the Plan for Research Approval form. Instructions for arranging this are here. Students must be complete the steps described there no later than 2 weeks before the exam. Math and Stat Admin will then complete the forms.

7.3.3 GS7D Form

Graduating Ph.D. students arrange for a GS7D form to be submitted to the Graduate School for final exam and dissertation approval. Instructions for arranging this are here. Students must be complete the steps described there no later than 2 weeks before the exam. Math and Stat Admin will then complete the GS7D form.

7.4 Deadlines

Deadlines for the GS2 and GS7 forms can be found here.

8 Student Responsibilities

8.1 Assistantship Information

Students supported by an instructional/teaching assistantship must be present at Clemson and be enrolled as a full-time student during the appropriate session(s). Duties are assigned by the Coordinator of Instruction prior to the beginning of each semester. Duties start the Monday before classes begin and end the day after grades are due at the end of the semester. You are expected to be present and available for any duties before then.

If a student is not assigned any duties by the first few weeks of the session, it is the student's responsibility to contact the Coordinator of Instruction and let them know.

All supported students must complete the TA training course offered in the Spring within one year. All international students must complete the Verification of English Skills Test (VEST) within one year as well.

8.2 Tracking Academic Progress

Academic progress is mainly tracked using two systems:

- the iroar system at the university level, and
- the GS-info system at the School/department level.

Students should check their records in both systems regularly to ensure accuracy, and update them as needed.

8.3 Yearly Evaluation

All graduate students will be evaluated by the School at the end of summer to assess their development as a student, in their assistantship responsibilities, and as a researcher.

8.4 Inform School of Status

Students are expected to keep the School updated on their status concerning enrollment or employment. Travel and resulting absences are to be reported through the Missed Class Notification form.

8.5 Email

Clemson students have two email addresses:

- Graduate *assistant* email address `username@clemson.edu`, and
- Graduate *student* email address `username@g.clemson.edu`.

Graduate students are required to check *both* of these email addresses regularly and to respond to messages within 48 hours. Students may set up email forwarding, etc., but it is the student's

responsibility to work with Clemson Computing and Information Technology (CCIT) and to make sure this is done correctly because official employment email will typically be sent to the `@clemson.edu` address only. Relevant weblinks:

- CCIT main page
- CCIT email page

If a graduate student fails to respond to emails on time, then they will be reprimanded in writing, a warning email will be sent for each offense, and documentation will be added to their personnel record, e.g., in GS-Info.

8.6 Proctoring

If a graduate student misses proctoring duties, then they will be reprimanded in writing, a warning email will be sent for each offense, and documentation will be added to their personnel record, e.g., GS-Info.

8.7 Evaluation and Consequences of Reprimands

If a graduate student does not adequately perform their duties, e.g., as described above, it will be reflected in their yearly evaluations. Cases of gross negligence may lead to termination of the assistantship as appropriate.

If a student has three reprimands in any 12-month period, SMSS will not provide summer support for the summer following the violations. If violations continue after this, SMSS will reduce the students support to 1/2 (in particular, they may not get the full tuition refund) in the Fall following the incidents and their level of support will be evaluated semester-by-semester thereafter.

These decisions will be evaluated on a yearly basis so that graduate students have an opportunity for a fresh start every Fall semester.

9 Facilities

The School maintains a computer laboratory for the exclusive use of its graduate students in Martin E-007. Access is provided to the campus-wide PC-based network as well as to the college network of Linux workstations. Specialized mathematical and statistical software packages for coursework and research are maintained on all of these platforms for student use.

Many of the courses offered by the School of Mathematical and Statistical Sciences are taught in 'smart' classrooms, with two or more projectors displaying information entered by the instructor on an electronic podium that has functions similar to those of a tablet computer. The School has multiple specialized classrooms. Martin M-303, M-304, and M-305, each containing 21 desktop computers, are used for undergraduate and graduate mathematical computing courses and courses requiring a computing lab. Martin M-1 is a 126-seat SCALE-UP classroom. SCALE-UP stands for Student-Centered Activities for Large Enrollment Undergraduate Programs. The room is equipped with 14 tables that each seat nine students. Every table is also equipped with three interactive monitors. This SCALE-UP classroom provides an innovative and interactive experience for the students.

9.1 Room Reservations

Martin Hall features two conference rooms, O-10 and O-112. To reserve either of these rooms, first check the availability on the appropriate calendar (O-10, O-112), then contact Math and Stat Admin (mathstatadmin@clemson.edu).

If you have a seminar or a weekly meeting that needs to be placed on the School calendar, contact Math and Stat Admin . The calendar is updated on a regular basis and should be utilized when scheduling visitors. This should help prevent Colloquia and seminars being scheduled at the same time.

For classroom reservations, contact Math and Stat Admin (mathstatadmin@clemson.edu, (864) 656-5230).

10 Inclusion and Equity

The School of Mathematical and Statistical Sciences aspires to create a diverse community that welcomes people of different races, cultures, ages, genders, sexual orientations, religions, socioeconomic levels, political perspectives, abilities, opinions, values, and experiences. For more information on the relevant policies, visit the Office of Access and Equity. Our diversity advocate in the College of Science is Dr. Calvin Williams, Associate Dean for Undergraduate Excellence, Global Engagement, Community Engagement and Inclusive Excellence (calvinw@clemson.edu, (864) 656-5241).