

STATISTICS: STATISTICS AND DATA SCIENCE, MS

This is a named option (formally documented sub-major) professional program in the Statistics MS (<https://guide.wisc.edu/graduate/statistics/data-science-ms/>). Data science is the study of extracting knowledge from data. Our MS Statistics: Statistics and Data Science option combines a background in statistical theory, methods and practice related to data science with communication skills to train a new generation of leaders who will use data effectively for planning and decision making.

Data science concepts enable students to translate vague questions about complex data into pragmatic analysis steps using statistical thinking. We build from basic methods that compare groups and relate measurements, to more complicated models that depend on the way data are gathered. In practice, planning and decision making involve choices about how to analyze data and communicate findings. These concepts will be grounded at key points with projects that involve real data and/or realistic simulated data.

Students may also be interested in the MS Data Science (<https://guide.wisc.edu/graduate/statistics/data-science-ms/#text>) professional program, offered by the Department of Statistics in cooperation with Department of Computer Sciences. The MS Data Science program is designed for students who are primarily interested in entering the data science profession, and teaches key computational and statistical skills that may be applied to a variety of industries.

ADMISSIONS

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Please consult the table below for key information about this degree program's admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program's website.

Graduate admissions is a two-step process between academic programs and the Graduate School. **Applicants must meet the minimum requirements (<https://grad.wisc.edu/apply/requirements/>) of the Graduate School as well as the program(s).** Once you have researched the graduate program(s) you are interested in, apply online (<https://grad.wisc.edu/apply/>).

Requirements	Detail
Fall Deadline	February 15
Spring Deadline	October 1
Summer Deadline	This program does not admit in the summer.
GRE (Graduate Record Examinations)	Not Required.
English Proficiency Test	Refer to the Graduate School: Minimum Requirements for Admission policy: https://policy.wisc.edu/library/UW-1241 (https://policy.wisc.edu/library/UW-1241/).
Other Test(s) (e.g., GMAT, MCAT)	n/a

Letters of Recommendation Required 3

Students with questions regarding the programs admission rules and standards should visit our application website (<https://stat.wisc.edu/graduate-studies/data-science-option/>).

The MS Statistics: Statistics and Data Science program is intended for three types of applicants:

- MS Statistics: Statistics and Data Science for Visiting International Student Program (VISP) students
 - Students from the Visiting International Student Program (Statistics VISP or Math VISP) who have completed some degree requirements at UW-Madison as Visiting International Student Program undergraduates. They may request transfer of up to 14 credits from their Visiting International Student Program coursework.
- MS Statistics: Statistics and Data Science for workforce students
 - Students coming with 5 or more years in the workforce who have worked extensively with data and are seeking a well-rounded training. Some students may be part-time students (6-8 credits per semester) if they remain in the workforce.
- MS Statistics: Statistics and Data Science for other general students
 - Students who have BS degrees or expected to obtain BS degrees prior to the first semester as MS Statistics: Statistics and Data Science students.

REQUISITES FOR ADMISSION

Applicants admitted to the MS Statistics: Statistics and Data Science program are expected to have courses equivalent to the UW-Madison courses listed below.

Code	Title	Credits
Calculus		
4 semesters of calculus:		
MATH 221	Calculus and Analytic Geometry 1	5
MATH 222	Calculus and Analytic Geometry 2	4
MATH 234	Calculus--Functions of Several Variables	4
MATH 421	The Theory of Single Variable Calculus (or another advanced analysis course)	3
Linear Algebra		
MATH 340 or MATH 345	Elementary Matrix and Linear Algebra Linear Algebra and Optimization	3
Highly Recommended		
STAT 303	R for Statistics I	1
STAT 304	R for Statistics II	1
STAT/MATH 309	Introduction to Probability and Mathematical Statistics I	3
STAT/MATH 310	Introduction to Probability and Mathematical Statistics II	3

FUNDING

FUNDING

GRADUATE SCHOOL RESOURCES

The Bursar's Office provides information about [tuition](#) and [fees associated with being a graduate student](#). [Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid](#). Further funding information is available from the Graduate School. Be sure to check with your program for individual policies and restrictions related to funding.

PROGRAM INFORMATION

Students enrolled in this program are not eligible to receive tuition remission from graduate assistantship appointments at this institution.

Additional information about funding and scholarships for MS Statistics: Statistics and Data Science is available on the program website (<https://stat.wisc.edu/graduate-admissions/data-science-option/>).

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum degree requirements (<https://guide.wisc.edu/graduate/#requirements>) and policies (<https://guide.wisc.edu/graduate/#policies>), in addition to the program requirements listed below.

NAMED OPTION REQUIREMENTS

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	Yes

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

Evening/Weekend: Courses meet on the UW-Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

Requirement Detail

Minimum Credit Requirement 30 credits

Minimum Residence Credit Requirement 16 credits

Minimum Graduate Coursework Requirement 15 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: <https://policy.wisc.edu/library/UW-1244> (<https://policy.wisc.edu/library/UW-1244/>).

Overall Graduate GPA Requirement 3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: <https://policy.wisc.edu/library/UW-1203> (<https://policy.wisc.edu/library/UW-1203/>).

Other Grade Requirements Students may only have one core course (STAT 601, STAT 610, or STAT 615) with a grade below B.

Assessments and Examinations None.

Language Requirements No language requirements.

REQUIRED COURSES

Code	Title	Credits
Core		
STAT 601	Statistical Methods I ¹	4
STAT 610	Introduction to Statistical Inference ¹	4
STAT 615	Statistical Learning ¹	3

Professional Skills Courses

STAT 605	Data Science Computing Project ¹	3
STAT 628	Data Science Practicum ¹	3
or STAT 678	Introduction to Statistical Consulting	

Electives

Students must complete 13 credits of electives. 13

STAT Courses Numbered 600 or Above

At least 6 credits of STAT courses numbered 600 or above including the following:

STAT 606	Computing in Data Science and Statistics (At least 6 credits of STAT courses numbered 600 or above including the following:)
STAT 609	Mathematical Statistics I
STAT/B M I 620	Statistics in Human Genetics
STAT/B M I 641	Statistical Methods for Clinical Trials
STAT/B M I 642	Statistical Methods for Epidemiology
STAT 679	Special Topics in Statistics (may be repeated with different topic titles)
STAT 701	Applied Time Series Analysis, Forecasting and Control I
STAT/MATH 709	Mathematical Statistics I
STAT/MATH 710	Mathematical Statistics II

STAT 732	Large Sample Theory of Statistical Inference
STAT/B M I 741	Survival Analysis Theory and Methods
STAT 760	Multivariate Analysis I
STAT 761	Decision Trees for Multivariate Analysis
STAT/B M I 768	Statistical Methods for Medical Image Analysis
STAT 771	Computational Statistics
STAT 772	Linear Randomized Algorithms for Data Science
STAT/ECON/ GEN BUS 775	Bayesian Statistics
STAT/MATH 803	Experimental Design I
STAT 809	Non Parametric Statistics
STAT 834	Empirical Processes and Semiparametric Inference
STAT 841	Nonparametric Statistics and Machine Learning Methods
STAT/B M I 877	Statistical Methods for Molecular Biology
STAT 992	Seminar

STAT Courses Numbered 300-599

Students may count up to 3 credits of STAT electives numbered 300-599 including:

STAT 303	R for Statistics I
STAT 304	R for Statistics II
STAT 305	R for Statistics III
STAT 349	Introduction to Time Series
STAT 351	Introductory Nonparametric Statistics
STAT 405	Data Science Computing Project
STAT 411	An Introduction to Sample Survey Theory and Methods
STAT 421	Applied Categorical Data Analysis
STAT 433	Data Science with R
STAT 436	Statistical Data Visualization
STAT 443	Classification and Regression Trees
STAT 451	Introduction to Machine Learning and Statistical Pattern Classification
STAT 453	Introduction to Deep Learning and Generative Models
STAT 456	Applied Multivariate Analysis
STAT 461	Financial Statistics
STAT/ COMP SCI 471	Introduction to Computational Statistics
STAT 479	Special Topics in Statistics
STAT 575	Statistical Methods for Spatial Data

Non-Departmental Course Numbered 500 or Above

Students may count up to 1 elective course (up to 4 credits) numbered 500 or above taught outside of STAT with advisor approval from the courses below. Students are not guaranteed a seat in an elective course taught from outside of the Statistics department. They must obtain departmental permission to enroll.

MATH/I SY E/ OTM/STAT 632	Introduction to Stochastic Processes
COMP SCI 540	Introduction to Artificial Intelligence
COMP SCI 577	Introduction to Algorithms
COMP SCI 640	Introduction to Computer Networks
COMP SCI/I SY E/ MATH/STAT 726	Nonlinear Optimization I

Remaining Electives

To satisfy the 13-credit elective minimum, students may also apply the following courses:

STAT 303	R for Statistics I
STAT 304	R for Statistics II
STAT 305	R for Statistics III
STAT/ COMP SCI 403	Internship Course in Comp Sci and Data Science (1 credit maximum allowed)
STAT 627	Professional Skills in Data Science
STAT 699	Directed Study (2 credits maximum allowed)

Total Credits **30**

¹ Students who are able to demonstrate equivalent prior coursework may request to substitute required course with a Statistics-taught course numbered 600 or above with advisor approval. Substitutions are not guaranteed and will be reviewed on a case-by-case basis.

Graduate and Undergraduate Courses with Similar Topics

Courses that cover the same or similar topic at the undergraduate- and graduate-level may both be used to fulfill the MS in Statistics and Data Science requirements, but if both courses are to be used, the undergraduate level course must be completed first. Note that this policy does not preclude students from taking just the undergraduate or just the graduate version of a topic. These combinations would include STAT 349 and STAT 701, STAT 351 and STAT 809, STAT 405 and STAT 605, STAT 411 and STAT 732, STAT 456 and STAT 760, STAT 443 and STAT 761, STAT 451 and STAT 615, and STAT/COMP SCI 471 and STAT 771. This will also apply to special topics courses that have similar topics between the undergraduate and graduate level.

Other Policy

Students in this program may not take courses outside the prescribed curriculum without faculty advisor and program director approval. Students in this program cannot enroll concurrently in other undergraduate or graduate degree programs.

POLICIES

GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures (<https://grad.wisc.edu/acadpolicy/>) serve as the official document of record for

Graduate School academic and administrative policies and procedures and are updated continuously. Note some policies redirect to entries in the official UW-Madison Policy Library (<https://policy.wisc.edu/>). Programs may set more stringent policies than the Graduate School. Policies set by the academic degree program can be found below.

NAMED OPTION-SPECIFIC POLICIES

PRIOR COURSEWORK

Graduate Credits Earned at Other Institutions

With program approval, students are allowed to transfer no more than 9 credits of graduate coursework from other institutions toward the graduate degree credit and graduate coursework (50%) requirements. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

Undergraduate Credits Earned at Other Institutions or UW-Madison

With program approval, up to 7 credits from a UW-Madison undergraduate degree are allowed to transfer toward the minimum graduate degree credit requirement. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements. This program does not accept undergraduate credits from other institutions.

Credits Earned as a Professional Student at UW-Madison (Law, Medicine, Pharmacy, and Veterinary careers)

Refer to the Graduate School: Transfer Credits for Prior Coursework (<https://policy.wisc.edu/library/UW-1216/>) policy.

Credits Earned as a University Special Student at UW-Madison

With program approval, up to 14 Statistics (STAT (<https://guide.wisc.edu/courses/stat/>)) credits completed at UW-Madison while a University Special student numbered 300 or above are allowed to transfer toward the minimum graduate degree credit requirement. Of these credits, those numbered 700 or above or are taken to meet the requirements of a capstone certificate and has the "Grad 50%" attribute may also transfer toward the minimum graduate coursework (50%) requirement. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

PROBATION

Students are required to follow all of the requirements listed in the program handbook (<https://stat.wisc.edu/graduate-studies/data-science-option/>) for maintaining satisfactory academic program. In particular, students must maintain a 3.0 GPA and have a minimum grade of B for any course used to satisfy program requirements. Students who do not make satisfactory academic progress for multiple semesters may be dismissed from the program.

ADVISOR / COMMITTEE

Students are required to communicate with their advisor near the beginning of each semester to discuss course selection and progress.

CREDITS PER TERM ALLOWED

15 credit maximum. Refer to the Graduate School: Maximum Credit Loads and Overload Requests (<https://policy.wisc.edu/library/UW-1228/>) policy.

TIME LIMITS

Students are expected to complete the program in 2 semesters (if coming from the Statistics Visiting International Student Program program) or 3-4 semesters. Students who wish to pursue the program part time must receive permission from the program chair.

GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (<https://doso.students.wisc.edu/bias-or-hate-reporting/>)
- Graduate Assistantship Policies and Procedures (<https://hr.wisc.edu/policies/gapp/#grievance-procedure>)
- Hostile and Intimidating Behavior Policies and Procedures (<https://hr.wisc.edu/hib/>)
 - Office of the Provost for Faculty and Staff Affairs (<https://facstaff.provost.wisc.edu/>)
- Employee Assistance (<http://www.eao.wisc.edu/>) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
- Employee Disability Resource Office (<https://employee disabilities.wisc.edu/>) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (<https://grad.wisc.edu/>) (for informal advice at any level of review and for official appeals of program/departamental or school/college grievance decisions)
- Office of Compliance (<https://compliance.wisc.edu/>) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office Student Assistance and Support (OSAS) (<https://osas.wisc.edu/>) (for all students to seek grievance assistance and support)
- Office of Student Conduct and Community Standards (<https://conduct.students.wisc.edu/>) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (<http://www.ombuds.wisc.edu/>) (for employed graduate students and post-docs, as well as faculty and staff)
- Title IX (<https://compliance.wisc.edu/titleix/>) (for concerns about discrimination)

L&S POLICY FOR GRADUATE STUDENT ACADEMIC APPEALS

Graduate students have the right to appeal an academic decision related to an L&S graduate program if the student believes that the decision is inconsistent with published policy.

Academic decisions that may be appealed include:

- Dismissal from the graduate program
- Failure to pass a qualifying or preliminary examination
- Failure to achieve satisfactory academic progress
- Academic disciplinary action related to failure to meet professional conduct standards

Issues such as the following cannot be appealed using this process:

- A faculty member declining to serve as a graduate student's advisor.
- Decisions regarding the student's disciplinary knowledge, evaluation of the quality of work, or similar judgements. These are the domain of the department faculty.
- Course grades. These can be appealed instead using the L&S Policy for Grade Appeal (<https://kb.wisc.edu/lis/22258/>).
- Incidents of bias or hate, hostile and intimidating behavior (<https://hr.wisc.edu/hib/>), or discrimination (Title IX (<https://compliance.wisc.edu/titleix/>), Office of Compliance (<https://compliance.wisc.edu/eo-complaint/formal-investigations/>)). Direct these to the linked campus offices appropriate for the incident(s).

Appeal Process for Graduate Students

A graduate student wishing to appeal an academic decision must follow the process in the order listed below. Note time limits within each step.

1. The student should first seek informal resolution, if possible, by discussing the concern with their academic advisor, the department's Director of Graduate Studies, and/or the department chair.
2. If the program has an appeal policy listed in their graduate program handbook, the student should follow the policy as written, including adhering to any indicated deadlines. In the absence of a specific departmental process, the chair or designee will be the reviewer and decision maker, and the student should submit a written appeal to the chair within 15 business days of the academic decision. The chair or designee will notify the student in writing of their decision.
3. If the departmental process upholds the original decision, the graduate student may next initiate an appeal to L&S. To do so, the student must submit a written appeal to the L&S Assistant Dean for Graduate Student Academic Affairs within 15 business days of notification of the department's decision.
 - a. To the fullest extent possible, the written appeal should include, in a single document: a clear and concise statement of the academic decision being appealed, any relevant background on what led to the decision, the specific policies involved, the relief sought, any relevant documentation related to the departmental appeal, and the names and titles of any individuals contributing to or involved in the decision.
 - b. The Assistant Dean will work with the Academic Associate Dean of the appropriate division to consider the appeal. They may seek additional information and/or meetings related to the case.
 - c. The Assistant Dean and Academic Associate Dean will provide a written decision within 20 business days.
4. If L&S upholds the original decision, the graduate student may appeal to the Graduate School. More information can be found on their website: Grievances and Appeals (<https://grad.wisc.edu/documents/grievances-and-appeals/>) (see: Graduate School Appeal Process).

OTHER

Not applicable.

PROGRAM RESOURCES

Students in the Statistics: Statistics and Data Science, MS program are encouraged to participate in program-specific professional development events and work directly, one-on-one, with advisors as well. Information about events and resources will be made available to currently enrolled students via email.

PROFESSIONAL DEVELOPMENT

PROFESSIONAL DEVELOPMENT GRADUATE SCHOOL RESOURCES

Take advantage of the Graduate School's professional development resources (<https://grad.wisc.edu/pd/>) to build skills, thrive academically, and launch your career.