STATISTICS: DATA SCIENCE, M.S.

This is a named option (formally documented sub-major) professional program in the Statistics M.S. (http://guide.wisc.edu/graduate/statistics/statistics-ms/#text)

ADMISSIONS

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/#english-proficiency) 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/).

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>March 1</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>October 15</td>
</tr>
<tr>
<td>Summer Deadline</td>
<td>This program does not admit in the summer.</td>
</tr>
<tr>
<td>GRE (Grad Record</td>
<td>Required.</td>
</tr>
<tr>
<td>Examinations)</td>
<td></td>
</tr>
<tr>
<td>English Proficiency</td>
<td>Every applicant whose native language is not</td>
</tr>
<tr>
<td>Test</td>
<td>English or whose undergraduate instruction was</td>
</tr>
<tr>
<td></td>
<td>not in English must provide an English proficiency</td>
</tr>
<tr>
<td></td>
<td>test score and meet the Graduate School minimum</td>
</tr>
<tr>
<td></td>
<td>requirements (<a href="https://grad.wisc.edu/apply/requirements/#english-proficiency">https://grad.wisc.edu/apply/requirements/#english-proficiency</a>).</td>
</tr>
<tr>
<td>Other Test(s) (e.g.,</td>
<td>n/a</td>
</tr>
<tr>
<td>GMAT, MCAT)</td>
<td></td>
</tr>
<tr>
<td>Letters of</td>
<td>3</td>
</tr>
<tr>
<td>Recommendation</td>
<td>Required</td>
</tr>
</tbody>
</table>

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: Data Science program is intended for three types of students:

- MS Statistics: Data Science for VISP students: Students from the Visiting International Student Program (Stat VISP or Math VISP) who have completed some degree requirements at UW-Madison as VISP undergraduates. They may request transfer of up to 15 credits from their VISP coursework.
- MS Statistics: 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: 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: Data Science students.

REQUISITES FOR ADMISSION

Course Requirements - Prerequisite Courses

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 221</td>
<td>Calculus and Analytic Geometry 1</td>
<td></td>
</tr>
<tr>
<td>MATH 222</td>
<td>Calculus and Analytic Geometry 2</td>
<td></td>
</tr>
<tr>
<td>MATH 234</td>
<td>Calculus—Functions of Several Variables</td>
<td></td>
</tr>
<tr>
<td>MATH 421</td>
<td>The Theory of Single Variable Calculus (or another advanced analysis course)</td>
<td></td>
</tr>
<tr>
<td>MATH 340</td>
<td>Elementary Matrix and Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

It is highly recommended that students also have:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 303</td>
<td>R for Statistics I</td>
</tr>
<tr>
<td>STAT 304</td>
<td>R for Statistics II</td>
</tr>
<tr>
<td>STAT/MATH 309</td>
<td>Introduction to Probability and Mathematical Statistics I</td>
</tr>
<tr>
<td>STAT/MATH 310</td>
<td>Introduction to Probability and Mathematical Statistics II</td>
</tr>
</tbody>
</table>

Degree Requirements

Students are required to have completed their BS/BA degree prior to the first semester as a MS Statistics: Data Science students.

FUNDING

GRADUATE SCHOOL RESOURCES

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (https://grad.wisc.edu/funding/) is available from the Graduate School. Be sure to check with your program for individual policies and restrictions related to funding.

PROGRAM RESOURCES

The M.S. Statistics: Data Science option is unique and does not allow students to accept a tuition remitting assistantship, hold multiple positions that would result in tuition remission, or to be concurrently enrolled in another university program or enrolled in courses outside of the M.S. Statistics: Data Science curriculum—see here (https://stat.wisc.edu/graduate-studies/data-science-option/) for more details.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/
## NAMED OPTION REQUIREMENTS

### MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Mode of Instruction</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face to Face</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Evening/Weekend</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Online</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Hybrid</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Accelerated</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

### Mode of Instruction Definitions

**Evening/Weekend**: These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.

**Online**: These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules. Take advantage of the convenience of online learning while participating in a rich, interactive learning environment. For more information about the online nature of a specific program, contact the program.

**Hybrid**: These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.

**Accelerated**: These on-campus programs are offered in an accelerated format that allows you to complete your program in a condensed time-frame. Enjoy the advantages of on-campus courses with minimal disruption to your career. For more information about the accelerated nature of a specific program, contact the program.

### CURRICULAR REQUIREMENTS

#### Requirements Detail

- **Minimum Credit Requirement**: 30 credits
- **Minimum Residence Credit Requirement**: 16 credits
- **Minimum Graduate Coursework Requirement**: Half of degree coursework (15 credits out of 30 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (https://registrar.wisc.edu/course-guide/).
- **Overall GPA Required**: 3.00 GPA required.
- **Other Grade Requirements**: A grade of B or better must be received in any course used to fulfill the required and elective course requirements.
- **Assessments and Examinations**: None.
- **Language Requirements**: No language requirements.

#### REQUIRED COURSES

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 601</td>
<td>Statistical Methods I</td>
<td>4</td>
</tr>
<tr>
<td>STAT 602</td>
<td>Statistical Methods II</td>
<td>4</td>
</tr>
<tr>
<td>STAT 610</td>
<td>Introduction to Statistical Inference</td>
<td>4</td>
</tr>
<tr>
<td>STAT 615</td>
<td>Statistical Learning</td>
<td>3</td>
</tr>
</tbody>
</table>

**Professional Skills Courses (6 credits minimum from the following courses):**

- STAT 605 Data Science Computing Project
- STAT 627 Professional Skills in Data Science
- STAT 628 Data Science Practicum

Students may substitute STAT 605 or STAT 615 with STAT 609 with advisor approval

**9 elective credits:**

**Students may count up to 3 credits of Statistics undergraduate electives 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 411 An Introduction to Sample Survey Theory and Methods
- STAT 421 Applied Categorical Data Analysis
- 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

**Students may count up to 3 credits of 600-level or above coursework taught outside of Statistics with advisor approval, including courses cross listed with Statistics but taught by other departments:**

Student must have at least 3 credits of coursework at the 600-level or above taught within Statistics including the following:

- STAT 609 Mathematical Statistics I
- 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
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 towards the MSDS requirements, but if both courses are to be used, the undergraduate level course must be completed first. Please 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 Introduction to Time Series and STAT 701 Applied Time Series Analysis, Forecasting and Control I, STAT 351 Introductory Nonparametric Statistics and STAT 809 Non Parametric Statistics, STAT 411 An Introduction to Sample Survey Theory and Methods and STAT 732 Large Sample Theory of Statistical Inference, STAT 456 Applied Multivariate Analysis and STAT 760 Multivariate Analysis I, STAT 443 Classification and Regression Trees and STAT 761 Decision Trees for Multivariate Analysis, STAT 451 Introduction to Machine Learning and Statistical Pattern Classification and STAT 615 Statistical Learning, and STAT/COMP SCI 471 Introduction to Computational Statistics and STAT 771 Statistical Computing. This will also apply to special topics courses that have similar topics between the undergraduate and graduate level.

TOTAL CREDITS 30

Policies

GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy/) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

NAMED OPTION-SPECIFIC POLICIES

PRIOR COURSEWORK

Graduate Work from Other Institutions

With program approval, students are allowed to count 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.

UW–Madison Undergraduate

With program approval, up to 7 statistics credits from a UW–Madison undergraduate degree are allowed to count toward minimum graduate degree credits. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

UW–Madison University Special

With program approval, up to 15 statistics credits completed at UW–Madison while a University Special student at the 300 level or above are allowed to count toward minimum graduate degree and graduate residence credit requirements. Of these credits, those at the 700 level or above may also count 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 progress. 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 credits

TIME CONSTRAINTS

Students are expected to complete the program in 2 semesters (if coming from the Statistics VISP 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/)
• Dean of Students Office (https://doso.students.wisc.edu/) (for all students to seek grievance assistance and support)
• 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://employeedisabilities.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/departmental or school/college grievance decisions)
• Office of Compliance (https://compliance.wisc.edu/) (for class harassment and discrimination, including sexual harassment and sexual violence)
• 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)

Students should contact the department chair or program director with questions about grievances.

OTHER
The MS Statistics: Data Science option is unique and does not allow students to accept a tuition remitting assistantship, hold multiple positions that would result in tuition remission, or to be concurrently enrolled in another university program or enrolled in courses outside of the MS Statistics: Data Science curriculum—see here (https://stat.wisc.edu/graduate-studies/data-science-option/) for more details.

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.

PROGRAM RESOURCES
Students in the M.S. Statistics: Data Science 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.

PEOPLE
Faculty: Professors J. Zhu (chair), Ane, Chappell, Chien, Keles, Larget, W-Y Loh, Newton, Shao, Y. Wang, Yandell, C. Zhang, Z. Zhang; Associate Professors P-L Loh, Raskutti, Rohe; Assistant Professors Garcia Trillos, Kang, Patel, Raschka, M. Wang, A. Zhang