Master's in Data Science
MICHIGAN STATE UNIVERSITY

2024-2025 GRADUATE HANDBOOK

Revised September 2024

This document is designed to serve as an introduction to the Master of Science or Arts and PhD programs in the Department of Statistics and Probability for those who may wish to apply and as a reference for those already enrolled.

University Policies override all inconsistent provisions in this handbook.

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I.   Program Contact Information

Program information:

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https://msds.msu.edu/

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II.   Overview of Program

Michigan State University's MS degree in Data Science (MSDS) is a cross-disciplinary, cutting-edge professional MS degree program shared by the College of Engineering and the College of Natural Science. It is a collaboration among three departments: the Department of Computational Mathematics, Science, and Engineering (CMSE), the Department of Computer Science and Engineering (CSE), and the Department of Statistics and Probability (STT). The MSDS is officially sanctioned by MSU, and has been approved by the State of Michigan.

The MSDS prepares professional students for the demands of tomorrow's workplace in data-driven decision making. Data science is an emerging interdisciplinary field whose purpose is the extraction of actionable insights from data. It employs theories and techniques from the core areas of statistics, computational mathematics, computer science, and information science. Our MSDS provides high-quality training in state-of-the-art data analysis and computational methods. We include coverage of the principles which underlie data science, encouraging students to understand not simply how to implement existing methods, but also why they work, when to use them appropriately, and when and how to develop novel methods tailored to new situations in any industry.

III.   Admission to the Program

a.   Requirements

Applicants are required to submit the following materials:

    (1) A transcript of any college courses taken. An unofficial transcript is sufficient for admission purposes, but official transcripts must be submitted before starting the program.

    (2) A professional resume.

    (3) A Personal Statement essay (detailed below).

  (4) 3 Letters of recommendation written by people familiar with the applicant's academic or work experience. The letters do not have to be from academic faculty.

  (5) Official score reports for English language requirements (detailed below), if applicable.

  b. How to Apply

    i. Online Application

All applications should be submitted online through the MSU application portal at https://admissions.msu.edu/. The application should include

  (a) A professional resume

  (b) A transcript for all higher academic institutions attended. Unofficial transcripts are sufficient for admissions purposes. Official transcripts are required before starting in the program.

  (c) 3 letters of recommendation.

  (d) Official English test scores, if required (see below)

  (e) A personal statement essay (see below)

  (f) Responses to all questions asked in the application portal

  (g) GRE scores are **not** required, but they may be submitted for consideration if the applicant so chooses.

    ii. English Requirements for International Applicants

English test scores are required for most international applicants. Requirements for these scores are set by the University and are not waivable. These requirements can be found at https://admissions.msu.edu/apply/international/language-requirements.

    iii. Personal Statement

A Personal Statement Essay is required for admission to the program. This Personal Statement should detail the applicant's motivation for pursuing the MSDS degree. As part of this goal, the applicant should detail why the applicant is interested, the preparation for the program which the applicant possesses, and what career goals the applicant has after completion of the degree.

  IV. Program Description

    a. Course Requirements

30 total credits are required for a Master's Degree. The following courses are required for the program:

  (1) CMSE 830

  (2) CMSE 831

  (3) CSE 482

  (4) CSE 881

  (5) STT 810

  (6) STT 811

One or more of these 6 required courses may be waived by the Director in unusual circumstances.

  b. Capstone

The capstone is a semester-length course where students independently work on and solve a data science problem. The capstone is typically taken as a course, CMSE 890, CSE 890, or STT 890. As part of the capstone requirement, students are required to make a public presentation of their project at its conclusion. The Master's in Data Science Program is classified only under Plan B (without thesis) for the

University. There is no thesis option for the program. Satisfactory performance at the Capstone project presentation fulfills the Master's Examination requirement for the program.

c. Elective Requirements

Students are required to take a minimum of 9 credit hours in electives. Some potential electives to be offered are below. Other electives appropriate to the Program can be used with approval of the Program Director. There is a lot of flexibility for the electives to be chosen, since the program is tailored to meet the needs of the students while providing a rigorous background to do data science.

Some possible electives are:
- STT 812, a compact course on modern statistical data analysis, including statistical learning
- STT 844, a course on time series analysis
- STT 873, a course on statistical learning and data mining
- STT 874, a course on Bayesian analysis
- STT 875, a course on R programming for statistics
- STT 890, a course on MLOps
- CSE 802, a course on pattern recognition
- CSE 830, a course on the design and analysis of algorithms
- CSE 840, a course on computation foundations of AI
- CSE 842, a course on natural language processing
- CSE 847, a course on machine learning
- CSE 849, a course on deep learning
- CMSE/CSE 822, a joint course on parallel computing
- CMSE 402, a course on communication in data science.

Many other electives are possible. Please consult with your advisor on whether courses you would be interested in will work.

d. Academic Advisor

An academic advisor works with the student to plan their program of study (any exception to the written program must be approved by the Director of the Program). At the beginning of the program, an academic advisor is chosen for the student, although a student is permitted to choose another academic advisor as long as the proposed advisor is in the one of the 3 departments for the Program, and the proposed advisor accepts the student to be an advisee.

V. Tuition

The overall tuition for the program is $39,000 for students starting in the 2024-25 school year. This tuition covers up to 36 credit hours, regardless of how long it takes to finish the program. Any future tuition changes will be announced at least 3 months prior to the start of a new Fall semester. There are other small fees charged by the University.

Most students will complete the program over the course of four semesters. Therefore, the tuition will be charged at a rate of ¼ of the total for each semester, or $9,750 per semester.   Students who wish to finish early by taking one or more courses in the summer will be charged this $9,750 fee for that summer. Students who wish to finish early by taking more than 9 credits one semester will be charged ½ tuition for that semester. Arrangements for part-time students will be determined on a case-by-case

basis. All deviations from the standard tuition payment structure must be approved by the Program Director.

For students with an assistantship, please note that the tuition waiver covers most but not all MSDS tuition. Assistantship tuition waivers cover tuition at the in-state graduate tuition rate, on a per-credit basis, while MSDS tuition is charged at the flat rate of $9,750 per semester. For example, for students taking 9 hours per semester, the amount of tuition not covered by the waiver was about $1,900 during the 2024-25 school year. For students taking fewer hours, the amount of tuition not covered by the waiver is higher.

VI.   General University Guidelines

a.   Academic Standards

The minimum grade level at which course credit is awarded is 2.0. The minimum standard for a degree is a 3.0 grade point average. The accumulation of grades below 3.0 in more than three courses (of three or more credits each) or deferred grades in more than three courses (of three or more credits each) automatically removes the student from candidacy for the degree. An accumulation (more than four courses) of a combination of grades below 3.0 and deferred grades will also remove the student from candidacy for the degree. A student who fails to meet the standards for any program may be required by the graduate director or the dean to withdraw at the end of the semester. A warning message will be sent to the student from the college or the department graduate office when academic performance or progress is judged to be unsatisfactory.

b.   Responsible and Ethical Conduct of Research (RECR)

Graduate students are required to complete Responsible and Ethical Conduct of Research trainings. STT Responsible and Ethical Conduct of Research (RECR) Plan. Integrity in research and creative activities is based on sound disciplinary practices as well as on a commitment to basic values such as fairness, equity, honesty, and respect. Students learn to value professional integrity and high standards of ethical behavior through interaction with members of the STT department and their faculty advisor, and by emulating exemplary behavior. The University views misconduct in research as the most serious violation of University policy. Every student and their faculty advisor must read and understand the document. Guidelines for Integrity in Research and Creative Activities. Criteria for dismissal from the graduate program due to unethical or dishonest behavior is also described in this document.

To understand who must complete RECR training, visit https://grad.msu.edu/researchintegrity. Note that students in the program will be following Master's Plan B (non-thesis) requirements. For students to become familiar with responsible and ethical conduct of research, the department requires our graduate students to complete the necessary training. The Responsible and Ethical Conduct of Research (RECR) plan applies to all students. The student's academic advisor and the Program's Academic Coordinator can assist in determining the requirements, as well as find suitable courses to fulfill the requirements.

The Graduate School RECR Workshop series may be used to help series may be used to help fulfill the annual refresher and discussion-based training requirements:
https://grad.msu.edu/rcr or visit STT Responsible and Ethical Conduct of Research (RECR) Plan for details. Completed trainings will appear in student's GradPlan.

c. Key Principles of Integrity

Integrity in research and creative activities embodies a range of practices that includes:
- Honesty in proposing, performing, and reporting research
- Recognition of prior work
- Confidentiality in peer review
- Disclosure of potential conflicts of interest
- Compliance with institutional and sponsor requirements
- Protection of human subjects and humane care of animals in the conduct of research • Collegiality in scholarly interactions and sharing of resources

Criteria for dismissal due to unethical or dishonest behavior while engaged in research, scholarly, and creative activities (GSRR 2.4.9; LSRR 2.4.1.5; MSRR 2.4.1.5).

Consequences of academic misconduct and MSU & college procedures after an academic dishonesty report (ADR) is filed. Policy Note: See MSU's Integrity of Scholarship & Grades policy, GSRR 8.1.2, and GSRR/LSRR/MSRR, Article 5.

d. Additional MSU policies

MSU Guidelines on Authorship

MSU's Institutional Data Policy

MSU's Procedures Concerning Allegations of Misconduct in Research and Creative Activities

Students who are supported by a federal grant may be required to complete additional specific training; they must meet the timeline and content requirements of training for that award. See michiganstate.sharepoint.com/sites/AbilityTrainingSystemHelpFAQ/SitePages/RCR-Home.aspx and grad.msu.edu/sites/default/files/content/researchintegrity/NSFDraft.pdf

Students engaged in research involving human subjects must complete the Michigan State University training modules for human subjects before submitting IRB approvals. Please visit hrpp.msu.edu/

e. Campus Safety Information

Campus safety information https://msu.edu/state-transparency-reporting/campus-safetyinformation-resources

Safety Guidelines for an Active Shooter Situation
https://comartsci.msu.edu/sites/default/files/documents/resources/safety-guidelines-for-activeshooter1.pdf

f. Orientation

Two orientation meetings are available to new graduate students who will begin study in the Fall Semester. Both orientation meetings are mandatory. Details are sent to new students in the early part of summer.

- A university orientation for all new graduate students usually held in August.
- A program orientation held during the week before Fall semester begins. This orientation will cover department programs in CMSE, CSE, and STT, as well as program policies.

g. Graduates Student Rights and Responsibilities

Michigan State University is committed to maintaining a learning and working environments for all students, faculty, and staff that is fair, humane, and responsible – an environment that supports career and educational advancement based on job and academic performance. The University is a community of scholars, and all graduate students are expected to conduct themselves in a civilized and scholarly manner.

The principles of truth and honesty are fundamental in a community of scholars. The University expects students to honor these principles and to protect the integrity of the University grading system.

Specifics of student's rights and responsibilities are contained in the document Graduate Student Rights and Responsibilities (GSRR). Each right of an individual places a reciprocal duty upon others: The duty to permit the individual to exercise the right. The student, as a member of the academic community, has both rights and duties. Within that community, the student's most essential right is the right to learn. The University has a duty to provide for the student those privileges, opportunities, and protections which best promote the learning process in all its aspects. The student also has duties to other members of the academic community, the most important of which is to refrain from interference with those rights of others, which are equally essential to the purposes and processes of the University. http://splife.studentlife.msu.edu/graduate-student-rights-and-responsibilities/article-1-graduate-student-rights-and-responsibilities-at-michigan-state-university

h. Student Files

The Program maintains an academic file for MSDS students. Any information concerning a student's role as a teaching assistant is kept in this file. That file may be read by the teaching assistant at any time. A teaching assistant may challenge the accuracy of any item in that file by submitting a letter to the Program Director. The letter will be placed in the file. See the MSU/GEU contract for more details. Students who are not teaching assistants may wish to consult "Graduate Student Rights and Responsibilities (GSSR), available at http://splife.studentlife.msu.edu/graduate-student-rights-and-responsibilities

i. Student Conduct and Conflict Resolution

When there are conflicts between a graduate student and their faculty advisor or guidance committee, the following procedure should be followed.

1. Consult with the Graduate Director, and hopefully reach an informal resolution if possible.
2. If such a resolution is not possible, a meeting should be set up with the conflicting parties and the Graduate Support Committee. The Committee will attempt to resolve the conflict

in keeping with the policies of the Department and University including the Guidelines for Graduate Student Advising and Mentoring Relationships.

3. If a student remains unsatisfied with the outcome of those conversations, the student may submit a written request to the Department Chairperson for a grievance hearing. The letter must state the specific nature of the complaint or remedy that the student seeks as an outcome of the hearing.

4. Upon receiving a request for a grievance hearing, the Department Chair will follow the grievance procedure laid out in V.7 Grievance Procedure and form a hearing board. The Hearing Board is governed by rules set forth in the document "Graduate Student Academic Grievance Hearing Procedures" at Graduate Student Academic Grievance Hearing Procedures

5. If the student prevails at the hearing, the Department Chair will implement an appropriate remedy to accommodate the student. If the faculty member(s) prevails at the hearing, the student may file a request to appeal the Statistics Program Hearing Board's decision to the College of Natural Science Hearing Board (see the document Graduate Student Rights and Responsibilities).

The University Ombudsperson is available to assist students, instructors, and hearing boards through every stage of the grievance process. The Office of the Ombudsperson can be consulted to determine the process for resolution at the Departmental, College or University level www.msu.edu/unit/ombud/

j. Judicial Structures

The Graduate Support Committee will hear student complaints only if the problem cannot be resolved after consulting with the graduate director, the student's major professor(s), and the department chairperson. If satisfactory resolution of a conflict is not achieved, the student may seek resolution through appropriate college/university judiciary structure (See the Graduate Student Right & Responsibilities document, http://splife.studentlife.msu.edu/graduate-student-rights-andresponsibilities/article-5-adjudication-of-cases-involving-graduate-student-rights-and-responsibilities

k. Grievance Procedures

The Michigan State University Student Rights and Responsibilities (SRR) and the Graduate Student Rights and Responsibilities (GSRR) documents establish the rights and responsibilities of MSU students and prescribe procedures to resolve allegations of violations of those rights through formal grievance hearings. In accordance with the SRR and the GSRR, the Hearing Board procedures for adjudicating graduate student academic grievances and complaints in the Department of Statistics and Probability (STT) have been established. (See GSRR 5.4.) Graduate Student Academic Grievance Hearing Procedure.

l. Dual and Joint Degree Programs

The MSDS program does not currently have any formal dual or joint degree programs. A dual or joint degree program is possible with agreement between both the MSDS Program Director and the second department. Please consult as soon as possible with the Program Director about any interest in such a dual or joint degree program.

m. University Resources

Campus Safety Resources

Council of Graduate Students (COGS)

Diversity, equity, & inclusion programs

Events

Forms

Funding

Graduate life & wellness

Graduate School Office of Well-Being (GROW)

Mentoring

Policy information

Professional development

Research integrity

Traveling scholar opportunities

University Committee on Graduate Studies

RVSM Training

Resources provided by university-level units such as OISS, RCPD, Student Affairs, the Libraries, the Olin Health Center, Inclusion & Intercultural Initiatives, the Burgess Institute for Entrepreneurship & Innovation, the Writing Center, and University Outreach & Engagement

Resources provided by the Student Life & Engagement Division such as the Student Parent Resource Center, the Gender and Sexuality Campus Center, the Student Veterans Resource Center, and Women's Student Services.

VII.   Appendix

MSDS Forms

    a. Annual Progress Report

    b. Research Integrity