

MASTER OF SCIENCE IN STATISTICAL DATA SCIENCE

Effective Spring 2020

The purpose of the program is to deliver a comprehensive curriculum in the fields of statistics and data science to prepare students with diverse backgrounds (including statistics, mathematics, computer science, engineering, and other quantitative fields) for the data science workforce or a doctoral program. The program curriculum emphasizes the following aspects. First, students will be trained in depth in modern statistical and machine learning techniques in addition to the classical statistics theory and applications. Second, they will learn and polish computational skills for various types of data sets including large-scale data ubiquitous in business, technology, and science. Third, these two aspects of the program is built on a solid foundation of statistics theory and understanding of mathematical principles behind techniques and algorithms; this blend is crucial for success in industrial and academic careers in the rapidly changing big data era. Finally, the program has built-in flexibility for different backgrounds and career plans through various electives.

Program Learning Outcomes

1. Apply statistical knowledge and computational skills to formulate problems, plan data collection, and analyze data to provide insight
2. Build and assess statistical and machine learning models, and employ a variety of formal inference procedures
3. Use mathematics to understand the underlying structure of common models used in statistical and machine learning
4. Prepare data for use with a variety of statistical methods and models, and recognize how the quality of data and data collection affect conclusions
5. Communicate effectively to a variety of audiences using oral, written, and visual modes

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Statistical Data Science (M.S.) – 30 Units

Required Courses (12 Units)

Code	Title	Units
<u>MATH 742</u>	Advanced Probability Models	3
<u>MATH 748</u>	Theory and Applications of Statistical and Machine Learning	3
<u>MATH 760</u>	Multivariate Statistical Methods	3
<u>MATH 761</u>	Computational Statistics	3

Electives (15 Units)

No more than 9 units should be from undergraduate only courses. Per student's interested specialization and upon Graduate Advisor's approval, the student will be recommended to choose a set of electives in the following areas: Probability and Statistics Electives, Mathematics Electives, Computer Science Electives, Biology Electives.

Culminating Experience (3 Units)

Candidates for the MS in Statistical Data Science must complete a Culminating Experience. Three options are available. Further information

for these options can be obtained at the department website <http://math.sfsu.edu>

Code	Title	Units
MATH 895	Internship Project	3
<u>MATH 896EXM & MATH 899</u>	Culminating Experience Examination and Independent Study	3
<u>MATH 898</u>	Master's Thesis	3