STATISTICS AND DATA SCIENCE, M.S.

Program Details

Department: Mathematics, Statistics and Data Science
Modality: In-Person
Semester hours: 30
Total years: 2

Objectives

The Master of Science in Statistics and Data Science (MSSDS) prepares students in theoretical and practical aspects of statistics and data science, giving them the training to push the state of practice forward. Beginning with foundational courses, students are able to customize their learning experience with electives from Computer Science, Business, Economics, Environmental Science, as well as offerings from Mathematics, Statistics and Data Science.

The goals of the program are as follows:

- Equip students with a solid foundation in statistics, machine learning, and artificial intelligence;
- Equip students with the ability to utilize the latest computational tools; and
- Prepare students for the ethical and social impacts their work will have.

Upon completion of the program, students will be able to

1. Demonstrate a deep understanding of probability and statistical theory as the foundation for statistical inference.
2. Demonstrate a solid understanding of linear algebra, gradient-based methods, and optimization theory as essential foundations for representation learning and model training in machine learning and deep learning.
3. Manage complex and large-scale datasets and apply programming tools such as R and Python to implement statistical and machine learning methods efficiently.
4. Formulate research questions, apply appropriate analytical methods, and conduct independent or collaborative research projects to address real-world problems in fields such as biomedical science, business, social science, and environmental studies.
5. Communicate statistical and analytical findings clearly and effectively through oral presentations, written reports, and data visualizations.
6. Recognize ethical issues in data collection, analysis, and reporting, and apply principles of privacy, reproducibility, and responsible AI.

Students seeking admission should have completed a bachelor's degree, including college-level coursework in multivariable calculus, linear algebra, statistics, probability, and programming. To be considered for admission, students must submit an application, $50 application fee, a statement of intent, and transcripts. Letters of recommendation and the Graduate Record Exam (GRE) are optional.

If prerequisite coursework is incomplete at the time of application review, the application may be placed on hold until official documentation of course completion is submitted. Required courses need not be taken at Loyola Marymount University; however, applicants are responsible for ensuring that courses taken at other institutions meet LMU's course standards.

In limited cases, the Admissions Committee may offer admission to applicants who are missing a limited number of prerequisite courses. In such instances, the additional required coursework will be stated in the admission letter and must be completed within a specific timeframe. These requirements are mandatory and cannot be waived.

International applicants should submit the items listed above plus the additional items required by LMU Graduate Admission. To review the additional requirements, visit the International Admission page (https://graduate.lmu.edu/apply/internationalstudents/).

Admission Policies

Transfer Credit

Students may transfer up to six (6) semester hours for graduate level courses completed at another regionally accredited college or university. Credits to be transferred must be taken prior to admission. Each transferred course grade must be at least B (3.0), and the course must not have been used to satisfy degree requirements at another college or university. To request more information about this process, contact SeaverGraduate (SeaverGraduateAdmission@lmu.edu)Programs@lmu.edu (SeaverGraduateAdmission@lmu.edu)

Deferment Policy

Students admitted into this graduate program may defer their admission offer for up to one year from the initial admission entry term. A formal request should be made by the student by contacting SeaverGraduateAdmission@lmu.edu. Requests to defer past the one-year mark from the initial admission entry term are reviewed upon request, and the decision is left to the discretion of the Admission Committee.

Appeal Process

The appeal process should be sought after once an admission decision has been provided, and the applicant would like to be reconsidered. To explore the appeal process, the applicant should be prepared to present new evidence of admissibility via new/additional/updated documentation aside from what was presented during the initial admission submission. Such documentation can be in the form of final grades, proof of updated relevant course completion and grade(s), etc.

In addition to the documents provided, the student will be required to submit a short essay stating why they are interested in having their application be reconsidered and explain how the new/updated documentation provided shows improvement for admission reconsideration. The admissions team will review the submission of all new documentation and provide the applicant with an updated decision. To request more information about this process, candidates interested in this option may contact SeaverGraduateAdmission@lmu.edu.

The proposed new Master of Science in Statistics and Data Science program requires a minimum of 30 semester units, consisting of 16 units of required courses and at least 14 units of elective courses (with at least 4 units chosen from courses with the MATH prefix).

Code	Title	Semester Hours
Required Courses		
MATH 505	Statistical Theory	4
MATH 506	Regression Methods 1	4
MATH 540	Deep Learning	4
MATH 570	Foundations of Machine Learning	4
Subtotal		16
Electives	**At least 4 units must be MATH courses.**	**14**
MATH 507	Computational Topics in Statistics	
MATH 606	Regression Methods II	
MATH 640	Large Language Models	
MATH 665	Data Mining and Pattern Analysis	
BSAN 6100	Data Visualization and Geographic Information Systems	
BSAN 6200	Text-Mining and Social Media Analytics	
CMSI 5350	Machine Learning	
CMSI 5370	Natural Language Processing and Large Language Models	
ECON 5320	Advanced Econometrics	
ENVS 552	Spatial Data Analysis and Geographical Information Systems	
Total Semester Hours		**30**