ACCELERATED STATISTICS AND DATA SCIENCE, M.S.

Program Details

Department: Mathematics, Statistics and Data Science
Modality: In-Person
Semester Hours: 30

Program Differentiation

The Accelerated Master of Science in Statistics and Data Science is curricularly identical to the Master of Science in Statistics and Data Science program, with the exception that some graduate coursework can be completed as an LMU undergraduate student. The Accelerated Master of Science in Statistics and Data Science program fulfills identical objectives and requirements as the standard Master of Science in Statistics and Data Science program, with the following logistical differences:

1. One Frank R. Seaver College of Science and Engineering 500/5000-level course (3-4 semester hours) taken as an undergraduate may count toward the M.S. degree. This course can be double counted for the undergraduate degree and the M.S. degree. The student is required to complete 26-27 additional semester hours beyond earning the B.S. degree.
2. In addition, for an admitted student, an extra Seaver College 500/5000-level course (3-4 semester hours) may be taken in their senior year that counts towards the M.S. degree and not the undergraduate degree. This potentially reduces the total number of additional semester hours after earning the B.S.E. degree to 22-24.
3. The remaining coursework required must be consistent with the graduation requirements for the Master of Science in Statistics and Data Science program.

All other aspects of the program are identical to the Master of Science in Statistics and Data Science, as seen below.

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.

This program is designed for LMU students from any major, provided they have successfully completed the following prerequisite coursework:

- Linear Algebra and Multivariable Calculus — for example, MATH 234 Calculus III and MATH 251 Applied Linear Algebra, or MATH 241 Multivariable Calculus and Linear Algebra.
- Statistics and Probability — for example, MATH 205 Applied Statistics and MATH 361 Probability and Mathematical Statistics.
- Computer Programming — for example, CMSI 1010 Computer Programming.

Only LMU students in their senior year, with a GPA of 3.0 or greater, are eligible to apply. Students will continue with the graduate-level portion of this program immediately following completion of their undergraduate degree.

Admission Requirements

- A completed online application (the application fee will be waived)
- Unofficial LMU transcripts
- A personal statement (1–2 pages) that explains how the Accelerated Statistics and Data Science M.S. Program fits into your career development

> **Note:** Students are required to apply for admission consideration before starting their final undergraduate semester at LMU. Please refer to our graduate website for admission deadlines. The student's final undergraduate semester at LMU should match the admission entry term that is selected on the graduate application. Interested applicants must meet and follow application deadlines.

The 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 from the MATH department).

Note that students (in particular SDS majors) may have already completed some of the required courses listed below during their undergraduate studies. In such cases, the following substitutions are permitted:

- If a student has taken MATH 506 Regression I as an undergraduate, they may instead enroll in ECON 5320 Advanced Econometrics.

- If a student has taken MATH 540 Deep Learning as an undergraduate, they may instead enroll in CMSI 5370 Natural Language Processing.
- If a student has taken MATH 570 Foundations of Machine Learning as an undergraduate, they may instead enroll in CMSI 5350 Machine Learning.

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.**	
MATH 507	Computational Topics in Statistics	2
MATH 606	Regression Methods II	2
MATH 640	Large Language Models	2
MATH 665	Data Mining and Pattern Analysis	2
BSAN 6100	Data Visualization and Geographic Information Systems	3
BSAN 6200	Text-Mining and Social Media Analytics	3
CMSI 5350	Machine Learning	4
CMSI 5370	Natural Language Processing and Large Language Models	4
ECON 5320	Advanced Econometrics	4
ENVS 552	Spatial Data Analysis and Geographical Information Systems	3
Subtotal		at least 14