

# MASTER OF SCIENCE IN MATHEMATICS

**Web Site:** <https://twu.edu/mathematics/graduate-programs/>

The Master of Science in Mathematics prepares the student to enter the workforce to teach at the community college level or to pursue doctoral degree programs in mathematics, statistics, applied mathematics, or related fields. The program of study also provides the student with an opportunity to include computer science and statistics in the degree plan.

An emphasis in applied mathematics is available for those desiring to pursue a career in a mathematics-related area in industry or government.

An emphasis in statistics is available for those interested in careers as applied statisticians or statistical programmers. Students can complete the program by taking evening or online courses in fall and spring.

Variable-length courses are available in face-to-face or online format each summer.

## Marketable Skills

Defined by the Texas Higher Education Coordinating Board's 60x30 Strategic Plan (<https://reportcenter.highered.texas.gov/agency-publication/miscellaneous/the60x30-strategic-plan/>) as, "Those skills valued by employers that can be applied in a variety of work settings, including interpersonal, cognitive, and applied skills areas. These skills can be either primary or complementary to a major and are acquired by students through education, including curricular, co-curricular, and extracurricular activities."

1. Apply mathematical theories and techniques to the solution of practical problems in business, engineering, the sciences, or other fields.
2. Develop mathematical or statistical models of phenomena to be used for analysis and computational simulation.
3. Determine appropriate methods for data analysis.
4. Develop new principles and new relationships between existing mathematical principles to advance mathematical science.
5. Disseminate research by writing reports, publishing papers, or presenting at professional conferences.
6. Demonstrate personal accountability and work habits, integrity, and ethical behavior.
7. Proficient in the software tools to achieve the skills listed, such as Matlab, R, SAS or SPSS, and LaTeX.

## Admissions

All students must meet the University requirements as outlined in the Admission to the TWU Graduate School (<http://catalog.twu.edu/graduate/graduate-school/admission-graduate-school/>) section of the catalog.

This academic program may have additional admission criteria that must also be completed as outlined on the program's website.

## Degree Requirements

### Total Semester Credit Hours Required

This is a 36 semester credit hour (SCH) degree with all coursework approved by a departmental advisor. Students must choose either a thesis or professional paper option. Those choosing the thesis option must include MATH 5983 and MATH 5993. Students selecting the

professional paper option must include MATH 5973 and an additional course approved by an advisor. Substitutions may be made with permission from a mathematics advisor.

### General Master of Science in Mathematics (36 SCH)

Code	Title	SCHs
<b>Electives</b>		
Choose ten of the following		30
MATH 5033	Advanced Calculus	
MATH 5323	Euclidean Geometry	
MATH 5423	History of Mathematics	
MATH 5483	Theory of Probability and Statistics I	
MATH 5493	Theory of Probability and Statistics II	
MATH 5513	Matrix Algebra	
MATH 5523	Introduction to Number Theory	
MATH 5543	Symbolic Logic	
MATH 5573	Statistical Methods I	
MATH 5583	Statistical Methods II	
MATH 5593	Differential Equations	
MATH 5833	Computer-Aided Mathematical Modeling	
MATH 5863	Applied Statistics and Convex Optimization	
MATH 5873	Real Analysis and Topology	
CSCI 5663	Statistical Programming	
<b>Culmination</b>		
Those choosing the thesis option must include MATH 5983 and MATH 5993. Students selecting the professional paper option must include MATH 5973		6
OR		
MATH 5973	Professional Paper & one additional Elective course from above	
Total SCHs		36

### Applied Mathematics Emphasis (36 SCH)

Code	Title	SCHs
<b>Required Courses</b>		
MATH 5033	Advanced Calculus	3
MATH 5513	Matrix Algebra	3
MATH 5523	Introduction to Number Theory	3
MATH 5593	Differential Equations	3
MATH 5833	Computer-Aided Mathematical Modeling	3
MATH 5873	Real Analysis and Topology	3
<b>Electives</b>		12
Twelve SCH selected from MATH and/or CSCI in consultation with and approved by advisor.		
<b>Culmination</b>		6
MATH 5983 Thesis & MATH 5993 and Thesis		
OR		
MATH 5973	Professional Paper (and an additional approved 3 SCH course)	
Total SCHs		36

## Statistical Emphasis (36 SCH)

Code	Title	SCHs
<b>Required</b>		
CSCI 5663	Statistical Programming	3
MATH 5483	Theory of Probability and Statistics I	3
MATH 5493	Theory of Probability and Statistics II	3
MATH 5513	Matrix Algebra	3
MATH 5573	Statistical Methods I	3
MATH 5583	Statistical Methods II	3
<b>Electives</b>		<b>12</b>
Twelve SCH selected from MATH and/or CSCI in consultation with and approved by advisor.		
<b>Culmination</b>		<b>6</b>
MATH 5983 & MATH 5993	Thesis and Thesis	
OR		
MATH 5973	Professional Paper (and an additional approved 3 SCH course)	
Total SCHs		36

## Thesis Option

30 semester credit hours of coursework.  
6 semester credit hours for thesis.

## Non-thesis Option

33 semester credit hours of course work.  
3 semester credit hours for professional paper.

## Cooperative Education

In order for coursework in Cooperative Education to be counted as degree credit, department approval must be received during the semester in which the course is taken. This approval is in addition to approval to enroll in Cooperative Education coursework. Cooperative Education coursework, as with any coursework, must also be approved by the student's advisory committee in order to be included in the degree plan. Only three semester credit hours of Cooperative Education may be counted toward the Master's degree.

## Final Examination

A comprehensive written examination upon completion of the coursework and an oral examination upon completion of the thesis or professional paper are required for all degrees.