

MS IN MATHEMATICS

The **M.S. program in Applied Mathematics** offers students a rigorous introduction to the fundamental tools of applied mathematics, with particular emphasis on differential equations and numerical analysis. The program requires 30 semester hours of course work that includes year-long courses in real analysis, numerical analysis, and differential equations and a semester course in complex analysis. Elective courses can be chosen from graduate courses in applied areas such as linear, nonlinear and dynamic programming, convex analysis, calculus of variations, applied functional analysis, and optimal control. A recently added Industrial Mathematics track allows students to take six of their elective hours in approved courses in the departments of Physics, Chemistry, Biology, Economics, Engineering, ISOM, Business or Environmental Sciences. A major component of this track is a project report (to serve as a thesis) which contains a solution to a practical "real-life" problem drawn from a company, university department or government unit.

The **M.S. program in Statistics** gives students training in methodology of applied statistics and also provides a solid foundation in statistical theory. Students' skills in applied statistics are developed through project-oriented courses, statistical computing emphasizing S+ and SAS, and faculty supervised experience in the Department's statistical consulting service. Through the statistical consulting service students gain first-hand experience assisting with the statistical analysis of problems that come from local institutions such as the U Toledo College of Medicine and The UToledo Center for Applied Pharmacology, and from local industries. The program requires 32 semester hours of courses. Among the required courses are applications of statistics, statistical inference, linear statistical models, multivariate analysis, statistical computing, non-parametric statistics, categorical data analysis, statistical consulting, and sample survey methods and theory.

The degree of Master of Science can be obtained in one of two options.

Option A – Applied Mathematics: To obtain the degree of Master of Science in the applied mathematics option, the student must complete a minimum of 30 semester hours of graduate credit and meet the following requirements:

Code	Title	Hours
MATH 5710 & MATH 5720	Methods Of Numerical Analysis I and Methods Of Numerical Analysis II	6
MATH 5820 & MATH 5830	Introduction To Real Analysis I and Introduction To Real Analysis II	6
MATH 6500 & MATH 6510	Ordinary Differential Equations and Partial Differential Equations	6
MATH 5880	Complex Variables	3
Select three of the following:		9
MATH 5540	Classical Differential Geometry I	
MATH 6500	Ordinary Differential Equations	
MATH 6510	Partial Differential Equations	
MATH 6520	Dynamical Systems I	
MATH 6530	Dynamical Systems II	
MATH 6720	Methods Of Mathematical Physics I	

MATH 6820	Functional Analysis I
MATH 5880	Complex Variables
MATH 5380	Discrete Structures And Analysis Algorithms
MATH 5680	Introduction To Theory Of Probability
MATH 5690	Introduction To Mathematical Statistics
MATH 5860	Calculus Of Variations And Optimal Control Theory I

The student must pass a two-part comprehensive examination or submit and defend a master's thesis.

Total Hours **30**

Option B – Statistics: To obtain the degree of Master of Science in the statistics option, the student must complete a minimum of 35 semester hours of graduate credit and meet the following requirements:

Code	Title	Hours
MATH 5680	Introduction To Theory Of Probability	3
MATH 5690	Introduction To Mathematical Statistics	3
MATH 5600	Advanced Statistical Methods I	3
MATH 5610	Advanced Statistical Methods II	3
MATH 5620	Linear Statistical Models	3
MATH 5630	Theory And Methods Of Sample Surveys	3
MATH 5640	Statistical Computing	3
MATH 6620	Categorical Data Analysis	3
MATH 6630	Nonparametric Statistics	3
MATH 6640	Topics In Statistics	3
MATH 6650	Statistical Inference	3
MATH 6690	Multivariate Statistics	3

Pass a two-part comprehensive examination, one part in probability and statistical theory and one part in applied statistics.

Total Hours **36**