MATHEMATICS - DOCTOR OF PHILOSOPHY

Candidates for the Ph.D. degree in the Department of Mathematical Sciences must pass

- a qualifying examination,
- a basic comprehensive written examination,
- an advanced comprehensive examination with written and oral components, and
- a final oral doctoral thesis examination.

These are briefly described below. For more information, see the Graduate School requirements in this catalog.

Course Requirements

Prefix	Title	Credits
Core Requirements		
MATH 5450	Abstract Algebra II: Fields, Rings and Modules	3
MATH 5460	Measure and Integration	3
MATH 5463	Real Analysis	3
MATH 5465	Introduction to Functional Analysis	3

In addition to the core requirements, each student must complete one of the following two options.

Prefix	Title	Credits
Option 1		
Choose three course sequences from Group A, as described below.		
Option 2		
Choose two course sequences from Group B and one from Group A, as described below.		

Course Sequences

Group A

Prefix	Title	Credits
Algebra: Choose two of the following.		
MATH 5453	Module Theory and Homological Algebra	
MATH 5455	Introduction to Commutative Algebra and Algebraic Geometry	
MATH 5458	Topics in Algebra	
Foundations: Choose two of the following.		
MATH 5430	Mathematical Structures in Logic	
MATH 5435	Universal Algebra and Model Theory	
MATH 5438	Topics in Foundations	
Topology: Choose two of the following.		
MATH 5420	Topology I	
MATH 5425	Topology II	
MATH 5428	Topics in Topology	

Group B

Prefix	Title	Credits
Differential Equations: Choose two of the following.		
MATH 5440	Partial Differential Equations I	
MATH 5440	Partial Differential Equations I	
MATH 5468	Topics in Analysis	
Probability: Choose two from the following.		
STAT 5310	Foundations of Probability	
STAT 5320	Advanced Topics in Stochastic Processes	
STAT 5348	Topics in Probability and Statistics	
Statistics: Choose two of the following.		
STAT 5330	Continuous Multivariate Analysis	
STAT 5335	Linear Models	
STAT 5340	Advanced Theory of Statistics I	
STAT 5345	Advanced Theory of Statistics II	
STAT 5348	Topics in Probability and Statistics	

Additional Course Requirements

A full time graduate student is required to register each semester for at least two Math/Stat graduate courses. With the exception of the final semester, of these two, only one may be MATH 6991 Doctoral Research or MATH 7000 Doctoral Dissertation. Moreover, these two courses **must not** include:

Prefix	Title	Credits
MATH 5210	Complex Variables	3
MATH 5220	Fourier Series and Boundary Value Problems	3
MATH 5997	Directed Reading	1-6
MATH 5120	History and Theories of Mathematics Education	3
MATH 5130	Algebra with Connections	3
MATH 5140	From Number to Algebra	3
MATH 5150	Data Analysis with Applications	3
MATH 5160	From Measurement to Geometry	3
MATH 5170	Using Number Throughout the Curriculum	3
MATH 5180	Geometry with Connections	3
MATH 5999	Master's Thesis	1-15

Qualifying Examination

Every student admitted to the Ph.D. program must pass a written qualifying examination. Students who complete their mathematics Master's degree at NMSU may request that the Master's written examination also fulfill the Ph.D. qualifying examination requirement. In all other cases, the student takes a written Ph.D. qualifying exam. This exam is identical to the Master's written exam (based on the courses 5350/5360) and is administered and graded at the same time, but a higher passing score is required than for a Master's student. Ph.D. candidates need to pass the exam within their first year.

Basic Comprehensive Examinations

Every Ph.D. student must pass a Basic Comprehensive Exam, either in Algebra or in Analysis. The Algebra exam is based on the courses MATH 5340 Abstract Algebra I: Groups and Rings and MATH 5450 Abstract Algebra II: Fields, Rings and Modules and the Analysis exam is based on the courses MATH 5365 Introduction to Real Analysis II and MATH 5460 Measure and Integration.

These exams are offered every August and January. A student choosing to take the exam in Algebra must pass the exam within fourteen months of completing Math 581; similarly, a student taking the exam in Analysis must pass the exam within fourteen months of completing MATH 5460. Students failing to pass the exams within this period of time may be removed from the program. Students will normally not be given more than two attempts at any one exam.

Advanced Comprehensive Examinations

Candidates for the Ph.D. must pass an advanced comprehensive examination in their chosen research area. The examination has a written and an oral component. The written exam, which is written and administered by the student's committee, is based on two of the student's courses, normally among those listed in Options 1-2, chosen by the student in consultation with his/her committee and approved by the Graduate Studies Committee. Full-time students should complete the written component of the Advanced Comprehensive Exam after passing the Basic Comprehensive Exam and in the first two years. Those who have not made substantial progress towards completion of their written exams at the start of the fifth semester may be removed from the program. Students who have not completed the written exams by the start of the sixth semester will normally have any departmental funding revoked. The student must take the oral part of the exam at the end of the semester after completing the advanced written comprehensive exam. For the oral exam, the student should present a proposed direction for thesis work.

Final Oral Exam

This is an exam over the student's thesis. It is administered by the student's thesis committee.