

# APPLIED MATHEMATICS & STATISTICS, AND SCIENTIFIC COMPUTATION, DOCTOR OF PHILOSOPHY (PH.D.)

Doctoral students must fulfill the coursework and pre-candidacy requirements of the corresponding concentration and/or pass a set of comprehensive written examinations at the Ph.D. level.

Details on the level and distribution of coursework and examinations in mathematics and in the applications area are given on the program web site: <http://www.amsc.umd.edu/programs/index.html> (<http://www.amsc.umd.edu/programs/>)

Students choose from one of the following concentrations:

## Applied Mathematics

Students are required to complete 18 credits of courses with mathematical content, and three credits in Numerical Analysis. Additional course requirements include six credits in an application area, nine credits of electives, two credits of approved seminars, and 12 credits of AMSC899.

**Advancement to Candidacy:** Students are also required to pass three written qualifying exams, and one oral exam

1. Mathematics Written Qualifying Exam
2. Application Area Written Qualifying Exam
3. Second Mathematics Written Qualifying Exam or coursework equivalents
4. Oral Candidacy Exam

Course	Title	Credits
<b>Core Requirements</b>		
Select 18 credits of courses with mathematical content and three credits in Numerical Analysis		18
Select six credits in an application area		6
Select nine credits of electives		9
Select two credits of approved seminars		2
<b>Dissertation Research Requirements</b>		
AMSC899	Doctoral Dissertation Research	12
<b>Total Credits</b>		<b>47</b>

## Applied Statistics

Students are required to complete 18 credits of statistics core courses, six credits of application courses, three credits of electives, three credits of AMSC760, two approved seminar or RIT courses, a one credit data project, and 12 credits of AMSC899.

**Advancement to Candidacy:** Students are also required to pass two written qualifying exams, and one oral exam

1. Mathematical Statistical Written Qualifying Exam
2. Application Statistics Written Qualifying Exam
3. Oral Candidacy Exam

Course	Title	Credits
<b>Core Courses</b>		
Select 18 credits of statistics core courses		18
Select six credits of application courses		6
Select three credits of electives		3
AMSC760	Applied Statistics Practicum	3
Select two approved seminar or RIT courses		2
Select a one credit data project		1
<b>Dissertation Research Requirements</b>		
AMSC899	Doctoral Dissertation Research	12
<b>Total Credits</b>		<b>45</b>

## Scientific Computation

Students are required to complete 6 credits of scientific computing core courses; 3 credits of CMSC616 (formerly CMSC818X); 9 credits by selecting from AMSC714, AMSC715, AMSC808N, AMSC763, and AMSC764; six credits of core science courses; six credits of scientific computing application courses; six credits of electives, and 12 credits of AMSC899.

**Advancement to Candidacy:** Students are also required to pass an oral candidacy exam.

Course	Title	Credits
<b>Core Courses</b>		
AMSC660	Scientific Computing I	3
AMSC661	Scientific Computing II	3
CMSC616	Foundations of Parallel Computing (Formerly CMSC818X)	3
Select 9 credits from the following courses:		9
AMSC665	Scientific Computing III: Data-Driven and Machine Learning Methods	
AMSC714	Numerical Methods For Stationary PDEs	
AMSC715	Numerical Methods for Evolution Partial Differential Equations	
AMSC763	Advanced Linear Numerical Analysis	
AMSC764	Advanced Numerical Optimization	
Select six credits of core science courses		6
Select six credits of scientific computing application courses		6
Select six credits of electives		6
<b>Dissertation Research Requirements</b>		
AMSC899	Doctoral Dissertation Research	12
<b>Total Credits</b>		<b>48</b>