DOCTOR OF PHILOSOPHY IN THE FIELD OF MATHEMATICS (STEM)

Faculty expertise in the PhD program in mathematics covers a wide range of research fields, including analysis, ordinary and partial differential equations, dynamical systems, applied math (including numerical analysis), combinatorics, logic, topology and knot theory. With about 30 graduate students and 20 faculty members, there is lively interaction as well as extensive individual attention.

All graduate students have individual advisors throughout their enrollment, starting from the time of admission. New students also receive peer advisors. In addition, research seminars and the department colloquium series help students explore potential research areas. Teaching assistantships are available for full-time students. Assistants gain teaching experience with a moderate workload, leading recitations for one introductory undergraduate course per semester.

The graduate certificate in mathematics (https://bulletin.gwu.edu/arts-sciences/mathematics/certificate-mathematics/) is offered for those who seek to strengthen their mathematical backgrounds at the advanced undergraduate and beginning graduate levels and better position themselves in their careers or prepare for graduate work in quantitative disciplines.

This is a STEM designated program.

Visit the program website (https://math.columbian.gwu.edu/phd-mathematics/) for additional information.

ADMISSIONS

Admission deadlines:	Fall - January 15 (late applications may be considered on a case-by-case basis)
Standardized test scores:	GRE general test required; GRE subject test recommended (institutional code 5246).
	The Test of English as a Foreign Language (TOEFL), the academic International English Language Testing System (IELTS), or the PTE Academic is required of all applicants except those who hold a bachelor's, master's, or doctoral degree from a college or university in the United States or from an institution located in a country in which English is the official language, provided English was the language of instruction.
	Minimum scores for the program are:
	- Academic IELTS: an overall band score of 7.0 with no individual score below 6.0; or
	- Duolingo: 110; or
	- TOEFL: 600 on paper-based or 100 on Internet-based; or
	- PTE Academic: 68;
Prerequisite requirements:	A bachelor's degree in mathematics or comparable coursework.
Recommendations required:	Three (3) recommendations
Prior academic records:	Transcripts are required from all colleges and universities attended, whether or not credit was earned, the program was completed, or the credit appears as transfer credit on another transcript. Unofficial transcripts from all colleges and universities attended must be uploaded to your online application. Official transcripts are required only of applicants who are offered admission. If transcripts are in a language other than English, English language translations must be provided. The English translation alone should be uploaded into your application.
Statement of purpose:	In an essay of 250 – 500 words, state your purpose in undertaking graduate study in your chosen field. Include your academic objectives, research interests, and career plans. Also discuss your related qualifications, including collegiate, professional, and community activities, and any other substantial accomplishments not already mentioned on the application. If you are applying for an assistantship or fellowship, you should also describe any teaching experience you have had.
Supplemental Essay	Briefly describe your most relevant research experience, including the place and venue with a description of the type of mathematics involved. For example: Senior Thesis "Milnor's theorem on knot curvature", REU "on Random graph theory at Eastern State Univ", conference presentation "Fractal Dimensions of Random Cantor sets at Nebraska Conference for Undergraduate Women", publication "Rose-Hulman Undergraduate Math Journal".
International applicants only:	Please review International Applicant Information (https://columbian.gwu.edu/international-graduate-applicants (https://columbian.gwu.edu/international-graduate-applicants/)) carefully for details on required documents, earlier deadlines for applicants requiring an I-20 or DS-2019 from GW, and English language requirements.

Supporting documents not submitted online should be mailed to:

Columbian College of Arts and Sciences, Office of Graduate Studies
The George Washington University
801 22nd Street NW, Phillips Hall 107
Washington DC 20052

For additional information about the admissions process visit the Columbian College of Arts and Sciences Frequently Asked Questions (https://columbian.gwu.edu/graduate-admissions-faq/) page.

Contact:

askccas@gwu.edu
202-994-6210 (phone)

Hours: 9:00 am to 5:00 pm, Monday through Friday

REQUIREMENTS

The following requirements must be fulfilled:

The general requirements stated under Columbian College of Arts and Sciences, Graduate Programs (https://bulletin.gwu.edu/arts-sciences/#degreeregulationstext).

The requirements for the Doctor of Philosophy Program (https://bulletin.gwu.edu/arts-sciences/#doctoraltext).

72 credits, including at least 45 credits of coursework, and at least 6 credits of dissertation research.

Pre-candidacy

During the pre-candidacy phase, students must complete a minimum of 45, but no more than 54, credits of coursework. This coursework is to be undertaken in preparation for the specialty examination.

To complete the initial 45 credits of coursework, students can seek permission from the graduate committee to enroll in MATH 6995 Reading and Research; however, enrollment in this course is limited to a maximum of 3 credits per semester.

Upon completion of 45 credits of coursework (by the end of the fifth semester, for full-time students), if students have not passed the specialty examination, they are permitted to register for an additional 3 credits of MATH 6995 during their sixth semester.

Students wishing to take courses outside the department must petition and obtain the approval of the graduate committee. The committee may limit the number of such courses that students take.

Subject to the approval of the graduate committee (requested via petition), students may take up to 12 credits of courses offered by other institutions in the Consortium of Universities of the Washington Metropolitan Area.

Subject to the approval of the graduate committee (requested via petition) and the agreement of the instructor, students may take up to 12 credits from the following upper-level undergraduate courses for graduate credit, provided that additional graduate-level coursework is completed in these classes.

Code	Title	Credits
MATH 3613	Introduction to Combinatorics	
MATH 3632	Introduction to Graph Theory	
MATH 3710	Introduction to Mathematical Logic	
MATH 3720	Axiomatic Set Theory	
MATH 3730	Computability Theory	
MATH 3740	Computational Complexity	
MATH 3848	Differential Geometry	
MATH 4239	Real Analysis I	
MATH 4240	Real Analysis II	
MATH 4981	Seminar: Topics in Mathematics	

Candidacy assessment process

To advance to candidacy, students must successfully complete at least 45 credits of coursework, a qualifying examination, and a specialty examination.

The qualifying examination covers four subject areas—algebra, analysis, applied mathematics, and topology—and is offered twice each year, before the start of the fall and spring semesters. The exam in each subject area is worth 30 points and may be taken no more than twice. To pass the qualifying examination, students must achieve a total of at least 50 points across three subject areas by the start of their fourth semester in the program.

The specialty examination is an oral examination in the student's intended research area. It is conducted by a committee of three faculty members, including the prospective director of the student's dissertation. Students are required to pass the specialty examination by the time they have completed 54 credits of coursework (by the end of the sixth semester, for full-time students).

Post-candidacy

Once they have advanced to candidacy, students must complete the remaining credits required for the Ph.D., including at least 6 credits of MATH 8999 Dissertation Research; their dissertation; and the successful defense of their dissertation in a final oral examination.