DOCTOR OF PHILOSOPHY IN THE FIELD OF MATHEMATICS

Faculty expertise 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 advisers throughout their enrollment, starting from the time of admission. New students also receive peer advisers. In addition, research seminars and the department colloquium series help students explore potential research areas. Teaching assistantships are available for full-time Ph.D. students. Each assistant gains teaching experience with a moderate workload, leading recitations for one introductory undergraduate course per semester. The post-baccalaureate certificate for those who seek to strengthen their mathematical backgrounds—at the advanced undergraduate and beginning graduate levels—is offered to better position students in their careers or to prepare for graduate work in quantitative disciplines.

The PhD in Mathematics is a STEM-designated program.

ADMISSIONS

Admission deadlines:
- Fall - December 1

Standardized test scores:
- GRE general test required; GRE subject test recommended (institutional code 5246). GRE general test waived for applicants who hold a JD, MD, or PhD.

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 6.0 with no individual score below 5.0; or
- TOEFL: 550 on paper-based or 80 on Internet-based; or
- PTE Academic: 53;

Prerequisite: A bachelor’s degree in mathematics or comparable coursework.

Recommendations:
Three (3) recommendations required:
- 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.
- 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.
- Certificate program: Statement of purpose is not required.

International applicants only:
- Please review International Applicant Information carefully for details on required documents, earlier deadlines for applicants requiring an I-20 or DS-2019 from GW, and English language requirements. Please note: international students who require a student visa from GW are not eligible to apply for admission to the Certificate program.

For more information on the admission process, please visit the Columbian College of Arts and Sciences Frequently Asked Questions page.

Supporting documents not submitted online should be mailed to:
Columbian College of Arts and Sciences - Graduate Admissions Office
The George Washington University
801 22nd Street NW, Phillips Hall 215
Washington DC 20052

Contact for questions:
askccas@gwu.edu – 202-994-6210 (phone) – 202-994-6213 (fax)
8:30 am – 5:30 pm, Monday through Friday

**REQUIREMENTS**

The following requirements must be fulfilled:

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

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

**Pre-candidacy**

Pre-candidacy requirements include satisfactory completion of 48 credits of coursework and achievement of a passing grade in the general examination.

**Coursework**

After completing 36 credits of coursework, students may petition the graduate committee for approval to take MATH 6995, but students may take no more than 12 credits in any combination of MATH 6995 and MATH 8999 in a single academic year.

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. Students wishing to take such courses must petition and obtain the approval of the graduate committee.

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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 3613</td>
<td>Introduction to Combinatorics</td>
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<tr>
<td>MATH 3632</td>
<td>Introduction to Graph Theory</td>
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<td>MATH 3710</td>
<td>Introduction to Mathematical Logic</td>
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<td>MATH 3720</td>
<td>Axiomatic Set Theory</td>
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<td>MATH 3730</td>
<td>Computability Theory</td>
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<td>MATH 3740</td>
<td>Computational Complexity</td>
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<td>MATH 3848</td>
<td>Differential Geometry</td>
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<tr>
<td>MATH 4239</td>
<td>Real Analysis I</td>
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<tr>
<td>MATH 4240</td>
<td>Real Analysis II</td>
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<tr>
<td>MATH 4981</td>
<td>Seminar: Topics in Mathematics</td>
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**General examination**

The general examination consists of two preliminary examinations. One examination is in two to four subjects selected from algebra, analysis, topology, and applied math, and the other is a specialty examination in a research area approved by the department.

**Post-candidacy requirements**

Post-candidacy requirements include the successful completion of an additional 24 credits of graduate coursework, including at least 6 credits of MATH 8999; the completion of the dissertation; and the successful defense of the dissertation in a final oral examination.

No more than 15 credits in any combination of MATH 6995 and MATH 8999 may be among the student’s final 18 credits of required coursework.

Once a student successfully completes 24 post-candidacy credits, they must register for 1 credit of CCAS 0940 (http://bulletin.gwu.edu/search/?P=CCAS%200940) each subsequent fall and spring semester until they have successfully defended their dissertation, thereby completing the degree program.