
MATHEMATICS (Ph.D.)

Executive Officer: Professor Józef Dodziuk

The Graduate Center

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FACULTY (AS OF JULY 2009)

Michael Anshel ■ Arthur W. Apter ■ Sergei Artemov ■ Alberto Baider ■ Ara Basmajian
■ Gilbert Baumslag ■ Martin Bendersky ■ Isaac Chavel ■ Gautam Chinta ■ Richard C.
Churchill ■ Sean Cleary ■ Józef Dodziuk ■ Melvin Fitting ■ Antonia Földes ■
Frederick P. Gardiner ■ Olympia Hadjiliadis ■ Joel D. Hamkins ■ Michael Handel ■
Raymond Hoobler ■ Jun Hu ■ Yunping Jiang ■ Bruce W. Jordan ■ Jay Jorgenson ■
Leon Karp ■ Linda Keen ■ Victor Kolyvagin ■ Adam Koranyi ■ Roman Kossak ■ Elena
Kosygina ■ Kenneth Kramer ■ Nikola Lakić ■ Joseph Lewittes ■ Michael B. Marcus ■
Attila Máté ■ Russell G. Miller ■ Carlos Julio Moreno ■ Alexei Myasnikov ■ Melvyn B.
Nathanson ■ Kevin O. O'Bryant ■ Cormac O'Sullivan ■ János Pach ■ Victor Pan ■
Rohit Parikh ■ Burton Randol ■ Alvany Rocha ■ Joseph Roitberg ■ Jay S. Rosen ■
Phillip Rothmaler ■ Hans Schoutens ■ Lev M. Shneyerson ■ Vladimir Shpilrain ■
Robert Sibner ■ Christina Sormani ■ David A. Stone ■ Dennis P. Sullivan ■ Zoltan I.
Szabo ■ Lucien Szpiro ■ John Terilla ■ Robert D. Thompson ■ Thomas N. Tradler ■
John A. Velling ■ John Verzani ■ Saeed Zakeri

For the most up-to-date faculty listings and specializations, see the program's Web site.

THE PROGRAM

The Ph.D. Program in Mathematics provides students of high ability and strong preparation with an opportunity to begin study for the doctoral degree either immediately upon graduation from college or after completing some graduate work in the colleges of the City University or at other accredited institutions. Doctoral work in mathematics is offered at the Graduate Center.

The program is designed to give students the background they will need to pursue careers as pure or applied mathematicians, including courses, seminars, and the completion of an original thesis. The student can specialize in and write a dissertation on a wide range of mathematical subjects. These currently include algebraic topology, analysis on homogeneous spaces, applied analysis, automata, combinatorics, complexity theory, computability, ordinary and partial differential equations, differential geometry, digital signal processing, dynamical systems, fluid dynamics, formal languages, global analysis, group theory, Lie groups, logic, matroids, number theory, optimization, probability, real and complex analysis, Riemann surfaces. The student body is small enough to facilitate close contact with the staff.

En-route M.A.

An en-route master's degree may be awarded by select senior colleges to doctoral students in mathematics. Further details may be obtained from the Executive Officer of the Mathematics program.

SPECIAL REQUIREMENTS FOR ADMISSION

In addition to meeting the general University requirements stated earlier in this bulletin, applicants are expected to present a substantial program of elective courses beyond calculus and must satisfy the Admissions Committee on the basis of their records in mathematics courses and letters of recommendation from instructors familiar with their work that they show promise of ability to complete the requirements for the Ph.D.

SPECIAL REQUIREMENTS FOR THE DOCTOR OF PHILOSOPHY

In addition to the general University requirements stated earlier in this bulletin, the student must meet the following requirements.

Course of Study Each student must follow a plan of study, approved by a faculty adviser, that usually includes three years of course and seminar work. A minimum of 81 graduate credits of course work are required for the degree, at least 60 of which must be in mathematics; the rest may be in closely related fields. At least 36 of the 60 credits in mathematics must be in nonintroductory courses or seminars.

First Examination Students should pass their First Examination within the first two years of graduate study. When this is not done, notices will be sent informing them that they must complete their First Examination by the end of the next academic year in order to maintain their matriculated status. In extraordinary cases, which must be presented in writing to the Executive Committee, additional time may be granted at the discretion of the Executive Committee.

Foreign Language The candidate must demonstrate ability to read the literature of mathematics in two of the following languages: French, German, and Russian. Substitution of other foreign languages may be permitted in special cases. Students must demonstrate the required proficiency in one of these languages before they complete their second year of study and in the second language before graduation.

Second Examination After passing the First Examination, the student specializes in some area of advanced mathematics. A faculty committee will be appointed to help the student arrange a program of study in an area of special interest. When this program of study is completed, the student takes an oral examination given by the faculty to determine readiness to pursue dissertation research.

Dissertation Each student must complete a dissertation embodying the results of original research in mathematics. The dissertation is usually written in a field of specialization recommended by the candidate's sponsor and approved by the faculty. The completed dissertation must be approved by the faculty and must be defended at an oral examination.

Courses

Unless otherwise stated, the following courses are *45 hours plus conferences, 4-1/2 credits*.

MATH 70100-70200 Functions of a Real Variable

MATH 70300-70400 Functions of a Complex Variable

MATH 70500-70600 Algebra

MATH 70700-70800 Topology

MATH 70910-70990 Problem Seminar

Hours and credits to be announced when given.

Courses in this number series are intended to serve as an introduction to mathematical research and will be focused on problems at a level of difficulty suitable for qualified first-year graduate students. Permission of the instructor is required.

Special Topics Courses

A variety of courses will be offered in special areas, number of credits and hours to be announced when scheduled. Appropriate prerequisites will be indicated for each course when it is given.

MATH 71000-71400 Topics in Set Theory and Logic

MATH 71500-71900* Topics in Applied Analysis

MATH 80000-80900 Topics in Euclidean, Hilbert, and Banach Spaces

MATH 81000-81900 Topics in Complex Variables

MATH 82000-82900 Topics in Topology

MATH 83000-83900 Topics in Probability, Stochastic Processes and Distributions

MATH 84000-84900* Topics in Optimization

MATH 85000-85900 Topics in Differential and Integral Equations

MATH 86000-86900 Topics in Differentiable Manifolds

MATH 87000-87900 Topics in Groups, Rings and Algebras

MATH 88000-88400 Topics in Algebraic Groups and Lie Groups

MATH 88500-88900 Seminars in Special Fields

Two seminars are required for the Ph.D. degree.

MATH 89000-89800 Advanced Seminars in Special Fields

One such seminar is required for the Ph.D.

MATH 89910-89921 Independent Research

Variable credit

Research for the doctoral thesis requires permission of a faculty supervisor and approval by the Executive Officer.

MATH 90000 Dissertation Supervision

*offered infrequently