

ABOUT THE PROGRAM

The Mathematics Program, through its MS and PhD degrees, aims to train future researchers and educators in mathematics.

The mission of the MS program is to equip students with advanced knowledge in analysis and algebra, as well as a deeper understanding of a chosen field of study. The mission of the PhD program, in addition, is to educate students to become independent researchers capable of producing and disseminating original results. Both programs place a strong emphasis on teaching practice. Graduate students gain valuable experience by leading recitation sessions and holding office hours for a variety of undergraduate courses.

MS students must complete a specified credit load and write a thesis exploring a particular area of mathematics. Graduates of the MS program are well prepared either for doctoral studies or for professional careers in industry.

PhD students must additionally pass written and oral qualifying examinations in two subjects and write a dissertation containing original mathematical research. Upon completion of the PhD program, graduates are prepared to pursue academic careers and join prestigious universities or research centers in Turkey or abroad.

Students are encouraged to participate in exchange programs in order to broaden their perspectives and engage with different research groups.

Research Areas

Algebra, Number Theory and Combinatorics

Non-associative division algebras, finite semifields.

Arithmetic of Finite Fields:

Permutation polynomials, polynomial factorisation.

Coding Theory:

Cyclic and quasi-cyclic codes, algebraic geometry codes, asymptotically good codes, maximum distance separable codes (MDS codes), maximum rank distance codes (MRD codes).

Combinatorial and Homological Methods in Commutative Algebra

Combinatorial Commutative Algebra (monomial and binomial ideals, toric algebras and combinatorics of affine semigroups, Cohen-Macaulay posets, graphs, and simplicial complexes), homological methods in Commutative Algebra (free resolutions, Betti numbers, regularity, Cohen-Macaulay modules), Groebner basis theory and applications.

Computational Number Theory

The arithmetic of elliptic and hyperelliptic curves, rational points on smooth planar curves, Gaussian hypergeometric series and character sums, arithmetic dynamics over finite fields and number fields.

Cryptology:

Sequences and stream ciphers, cryptographically significant functions (bent, plateaued, almost perfect nonlinear), secret sharing schemes.

Enumerative Combinatorics and Applications:

Integer partitions, permutations and permutation statistics. Basic hypergeometric series and their identities. Bijective and sieve methods, combinatorics of partially ordered sets.

Function Fields and Curves over Finite Fields:

Rational points, maximal curves, towers of function fields, automorphisms, modular curves, Drinfeld modular curves.

Analysis and Partial Differential Equations

Several complex variables, complex geometry, holomorphic dynamics, complex potential theory, functional analysis, operator theory on function spaces, dynamics of linear operators, approximation theory, orthogonal polynomials, random polynomials.

• **Partial Differential Equations:** Nonlinear partial differential equations, pseudo-differential operators, dispersive wave models and qualitative analysis of the corresponding initial-value problems.

Probability and Statistic

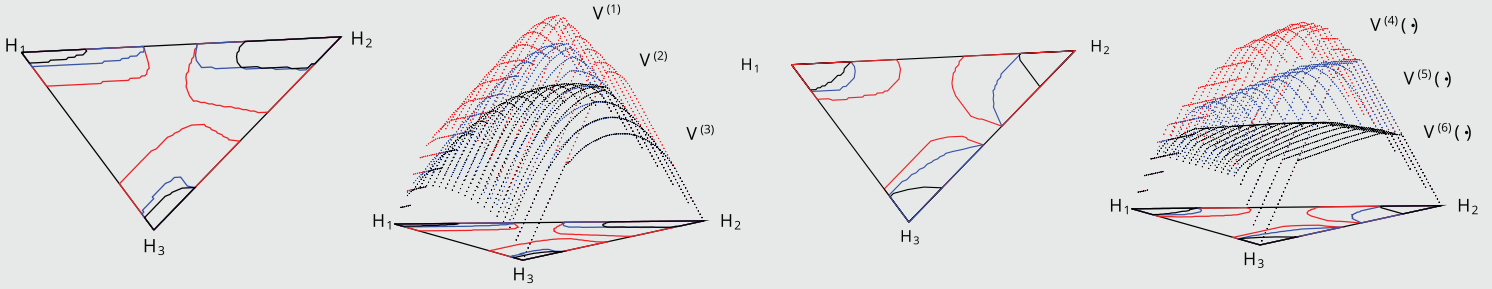
Probability measures in infinite dimensional spaces, nonlinear theory of distributions.



MATHEMATICS

GRADUATE SCHOOL OF ENGINEERING AND NATURAL SCIENCES

GRADUATE PROGRAMS



Faculty Members

- Ayesha Asloob Qureshi
- Cem Güneri
- Dimitris Papathanasiou
- Ferruh Özbudak
- Gökalp Alpan
- Kağan Kurşungöz
- Mohammad Sadek
- Nihat Gökhan Göğüş
- Nilay Duruk Mutlubaş
- Nurdagül Anbar Meidl
- Semih Onur Sezer
- Turgay Bayraktar

Benefits Provided for Graduate Students

- Full Tuition Waiver
- Monthly Stipend
- Housing/Transportation Support
- Private Health Insurance
- Conference Travel Funding
- Financial Incentives for Project and Research

Application Requirements

- Official Transcript
- Statement of Purpose
- CV
- Two Letters of Recommendation
- ALES / GRE / GAT Score
- English Proficiency Exam Score (TOEFL (IBT) / PTE / CAE / CPE / YDS / e-YDS / YÖKDİL / e-YÖKDİL)

Online Application

admission.sabanciuniv.edu

Contacts

Graduate Coordinator

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For more information

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