# Mathematics

Purpose: This collection supports teaching and research through the doctoral level in mathematics and astronomy. As this field considers the library its "laboratory," the Department of Pure and Applied Mathematics has sought to make this a thorough, high quality collection.

Publications in these fields are also of interest to those studying and doing research in other scientific and technical fields, to statisticians, and to social scientists.

## General Collection Guidelines:

Languages: English is the primary language of collection, but purchases are also made in German, French, and Russian.

Chronological Guidelines: Research interest is primarily in the twentieth century. Books dealing with historical, philosophical, and cultural aspects of mathematics are of interest but receive second priority.

Geographical Guidelines: Not applicable.

Treatment of the Subject: Lower-division textbooks generally are not purchased. Upper-division textbooks and popular works are acquired selectively. Emphasis is on graduate level texts and research material.

Types of Material: Acquisitions are primarily in the form of monographs and periodicals, but also include proceedings/transactions of conferences, dictionaries, encyclopedias, directories, technical reports, microforms, and government documents in any suitable format. In addition, astronomy requires atlases, catalogs, and charts

Date of Publication: Emphasis is on the acquisition of current imprints. In the case of non-current publications there will be no preference given to original prints or editions as opposed to reprints.

Other General Considerations: The Palomar Observatory Sky Atlas is a major astronomical resource.

## Observations and Qualifications by Subject with Collection Level:

Differential Equations, both Partial and Ordinary: C(1) / B

Their analytic solution, numerical solution and the qualitative theory.

Mathematical Modelling: B

Measure Theory, Function Analysis, and Abstract Harmonic Analysis: B

Operational Calculus: D / B

Graph Theory and Combinatorics: C(1) / B

Projective and Finite Geometries: D / B

Finite fields and finite groups: D / B

Matrix Theory and Analysis: D / B

Number Theory: B

Both algebraic and analytic.

Topology, General: C(1) / B

Differential Geometry: C(1) / B

Complex Analysis: C(1) / B

Functions of a complex variable; functions of several complex variables.

Mathematical Statistics: B

Stochastic processes; reliability theory; design of experiments; data analysis.

Operations Research, Optimization, Mathematical Programming: B

Continuum Mechanics: D / B

Computational Mathematics: C(1) / B

Numerical Analysis: B

Approximation Theory: D / B

Special functions, approximations and expansions, integral transforms, integral equations.

Applications in Physics, Engineering, and Biology: D / B

Foundations of Mathematics: C(2) / C(1)

Set theory, order, lattices, ordered algebraic structures, and general mathematical systems.

Algebra: C(2) / B

Field theory, polynomials, commutative rings and algebras, algebraic geometry, linear and multilinear algebra, associative rings and algebras, nonassociative rings and algebras, and category theory and homological groups.

Group Theory: C(1) / B

Topological groups; lie groups.

Mathematical Analysis: C(1)

Real functions, potential theory, special functions, finite differences and difference equations, and functional equations.

Approximation Theory: C(1) / B

Sequences, series, summability; Fourier analysis; calculus of variations and optimal control.

Geometry: C(1) / B

Convex sets and geometric inequalities; manifolds and cell complexes; global analysis and analysis on manifolds.

Cryptography: D / B

See also:

Engineering: Electrical/Computer Science

Mathematics Education (college level): B

See also:

Education: General

Higher Education

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