1991 Mathematics Subject Classification

1991 Mathematics Subject Classification (MSC)

This is a corrected reprint of the 1991 MSC, which has been in use at MR starting with the January 1991 issue. The 1991 MSC was first printed in the Annual Index for 1990. Corrections and additions since then include the following: 11M36, 14J32, 17B69 and 53Z05 are new. Subsection 11Z50 has been relabeled 11Z05 and 73P05 has been relabeled 73P20. There are several entries in section 17 in which there have been small changes or additions in the description.

Instructions for using the 1991 Mathematics Subject Classification

These instructions apply uniformly to all fields listed. The main purpose of the classification is to help readers to find the items of present or potential interest to them as readily as possible—in MR, in Zbl, or anywhere else where this classification system is used. The review of a paper or book should be printed in the section where it will receive the broadest attention from all readers possibly interested in it—these include both people working in that area and people who are familiar with that area and apply its results and methods elsewhere (inside or outside of mathematics). It will be extremely useful for both readers and classifiers to familiarize themselves with the entire classification system and thus to become aware of all the classifications of possible interest to them.

Every paper or book reviewed in MR receives precisely one "primary" classification number, which is simply the number of the section in which the review of the item will be printed. This section should be the one that covers the principal contribution. When a paper contains several principal contributions in different areas, the primary classification should cover the "most important" among them. A paper or book may receive one or several "secondary" classification numbers (or "cross-references") to cover any remaining principal contributions, ancillary results, motivation or origin of the problems discussed, intended or potential field of application, or other significant aspects worthy of notice.

The "primary" principal contribution is meant to be the one including the most important part of the work actually done in the paper. For example, a paper whose main overall content is the solution of a problem in graph theory, which arose in computer science and whose solution is (perhaps) at present only of interest to computer scientists, belongs primarily in 05C with a cross-reference in 68; conversely, a paper whose overall content lies mainly in computer science should receive a primary classification in 68, even if it makes heavy use of graph theory and proves several new graph-theoretic results along the way.

For an item with its primary classification in an "applied" section (68 through 94), it is recommended that a cross-reference be given to any "pure" mathematics section (00 through 65) to which the item being classified makes a contribution.

There are two types of cross-references given after many classifications in the list. The first type is of the form "{For A, see X}"; if this appears in section Y, it means that for contributions described by A one should usually assign the classification X, not Y. The other type of cross-reference merely points out related classifications; it is of the form "[See also . . .]", "[See mainly . . .]", etc., and the classifications listed in the brackets may, but need not, be added to the classification of a paper, or they may be used in place of the classification where the cross-reference is given. The classifier will have to judge which classification is the most appropriate for the paper at hand.

00–XX GENERAL
- 00–01 Instructional exposition (textbooks, tutorial papers, etc.)
- 00–02 Research exposition (monographs, survey articles)
- 00Axx General and miscellaneous specific topics
- 00A05 General mathematics
- 00A06 Mathematics for nonmathematicians (engineering, social sciences, etc.)
- 00A07 Problem books
- 00A08 Recreational mathematics
- 00A15 Bibliographies
- 00A20 Dictionaries and other general reference works
- 00A22 Formularies
- 00A30 Philosophy of mathematics [See also 03A05]
- 00A35 Methodology of mathematics, didactics
- 00A69 General applied mathematics {For physics, see 00A79 and Sections 70 through 86}
- 00A71 Theory of mathematical modeling
- 00A72 General methods of simulation
- 00A73 Dimensional analysis
- 00A79 Physics (use more specific entries from Sections 70 through 86 when possible)
- 00A99 Miscellaneous topics
- 00Bxx Conference proceedings and collections of papers
- 00B05 Collections of abstracts of lectures
- 00B10 Collections of articles of general interest
- 00B15 Collections of articles of miscellaneous specific content
- 00B20 Proceedings of conferences of general interest
- 00B25 Proceedings of conferences of miscellaneous specific interest
- 00B30 Festschriften
- 00B50 Volumes of selected translations
- 00B55 Miscellaneous volumes of translations
- 00B60 Collections of reprinted articles [See also 01A75]

01–XX HISTORY AND BIOGRAPHY [See also the classification number –03 in the other sections]
- 01–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
- 01–01 Instructional exposition (textbooks, tutorial papers, etc.)
- 01–02 Research exposition (monographs, survey articles)
- 01–06 Proceedings, conferences, collections, etc.
- 01–08 Computational methods
- 01Axx History of mathematics and mathematicians
- 01A05 General histories, source books
- 01A07 Ethnomathematics, general
- 01A10 Paleolithic, Neolithic
- 01A12 Indigenous cultures of the Americas
- 01A13 Other indigenous cultures (non-European)
- 01A15 Indigenous European cultures (pre-Greek, etc.)
- 01A16 Egyptian
- 01A17 Babylonian
- 01A20 Greek, Roman
- 01A25 China
- 01A27 Japan
- 01A29 Southeast Asia
- 01A30 Islam (Medieval)
- 01A32 India
- 01A35 Medieval
- 01A40 15th and 16th centuries, Renaissance
- 01A45 17th century
- 01A50 18th century
- 01A55 19th century
- 01A60 20th century
- 01A65 Contemporary
- 01A67 Future prospectives
- 01A70 Biographies, obituaries, personalia, bibliographies
- 01A72 Schools of mathematics
- 01A73 Universities
- 01A74 Other institutions and academies
- 01A75 Collected or selected works; reprintings or translations of classics [See also 00B60]
- 01A80 Sociology (and profession) of mathematics
- 01A99 Miscellaneous topics

03–XX MATHEMATICAL LOGIC AND FOUNDATIONS
- 03–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
- 03–01 Instructional exposition (textbooks, tutorial papers, etc.)
- 03–02 Research exposition (monographs, survey articles)
- 03–03 Historical (must also be assigned at least one classification number from Section 01)
- 03–04 Explicit machine computation and programs (not the theory of computation or programming)
- 03–06 Proceedings, conferences, collections, etc.
- 03A05 Philosophical and critical {For philosophy of mathematics, see 00A30}
- 03Bxx General logic
- 03B05 Classical propositional logic
- 03B10 Classical first-order logic
- 03B15 Higher-order logic and type-theory
- 03B20 Subsystems of classical logic (including intuitionistic logic)
- 03B22 Abstract deductive systems
- 03B25 Decidability of theories and sets of sentences [See also 11U05, 12L05, 20F10]
- 03B30 Foundations and axiomatics of classical theories
- 03B35 Mechanization of proofs and logical operations [See also 68T15]
- 03B40 Combinatory logic and λ-calculus
- 03B45 Modal and tense logic {For provability logics, see also 03F40}
- 03B46 Relevance and entailment
- 03B48 Probability and inductive logic [See also 60A05]
- 03B50 Many-valued logic
- 03B52 Fuzzy logic [See also 94D05]
- 03B53 Paraconsistent logic
- 03B55 Intermediate logics
- 03B60 Other nonclassical logic

03B65 Logic of natural languages [See also 68S05, 92K20]
03B70 Logic of programming [See also 68Q55, 68Q60]
03B80 Other applications of logic
03B99 None of the above, but in this section
03Cxx Model theory
03C05 Equational classes, universal algebra [See also 08Axx]
03C07 Basic properties of first-order languages and structures
03C10 Quantifier elimination and related topics
03C13 Finite structures
03C15 Denumerable structures
03C20 Ultraproducts and related constructions
03C25 Model-theoretic forcing
03C30 Other model constructions
03C35 Categoricity and completeness of theories
03C40 Interpolation, preservation, definability
03C45 Stability and related concepts
03C50 Models with special properties (saturated, rigid, etc.)
03C52 Properties of classes of models
03C55 Set-theoretic model theory
03C57 Recursion-theoretic model theory [See also 03D45]
03C60 Model-theoretic algebra [See also 08C10, 12Lxx, 13L05]
03C62 Models of arithmetic and set theory [See also 03Hxx]
03C65 Models of other mathematical theories
03C68 Other classical first-order model theory
03C70 Logic on admissible sets
03C75 Other infinitary logic
03C80 Logic with extra quantifiers and operators [See also 03B45]
03C85 Second- and higher-order model theory
03C90 Nonclassical models (Boolean-valued, sheaf, etc.)
03C95 Abstract model theory
03C99 None of the above, but in this section
03Dxx Recursion theory
03D03 Thue and Post systems, etc.
03D05 Automata and formal grammars in connection with logical questions [See also 68Qxx]
03D10 Turing machines and related notions [See also 68Q05]
03D15 Complexity of computation [See also 68Q15]
03D20 Recursive functions and relations, subrecursive hierarchies
03D25 Recursively enumerable sets and degrees
03D30 Other degrees; reducibilities
03D35 Undecidability and degrees of sets of sentences
03D40 Word problems, etc. [See also 06B25, 08A50, 20F10]
03D45 Theory of numerations, effectively presented structures [See also 03C57]
03D50 Recursive equivalence types of sets and structures, isols
03D55 Hierarchies
03D60 Recursion theory on ordinals, admissible sets, etc.
03D65 Higher-type and set recursion theory
03D70 Inductive definability
03D75 Abstract and axiomatic recursion theory
03D80 Applications of recursion theory
03D99 None of the above, but in this section
03Exx Set theory [See also 04–XX]
03E05 Combinatorial set theory [See also 04A20]
03E10 Ordinal and cardinal numbers [See also 04A10]
03E15 Descriptive set theory [See also 04A15, 28A05, 54H05]
03E20 Other classical set theory
03E25 Axiom of choice and related propositions [See also 04A25]
03E30 Axiomatics of classical set theory and its fragments
03E35 Consistency and independence results
03E40 Other aspects of forcing and Boolean-valued models
03E45 Constructibility, ordinal definability, and related notions
03E47 Other notions of set-theoretic definability
03E50 Continuum hypothesis and Martin's axiom [See also 04A30, 54A25]
03E55 Large cardinals
03E60 Determinacy and related principles which contradict the axiom of choice
03E65 Other hypotheses and axioms
03E70 Nonclassical and second-order set theories
03E72 Fuzzy sets [See mainly 04A72]
03E75 Applications
03E99 None of the above, but in this section
03Fxx Proof theory and constructive mathematics
03F03 Proof theory, general
03F05 Cut-elimination and normal-form theorems
03F07 Structure of proofs
03F10 Functionals in proof theory
03F15 Recursive ordinals and ordinal notations
03F20 Complexity of proofs
03F25 Relative consistency and interpretations
03F30 First-order arithmetic and fragments
03F35 Second- and higher-order arithmetic and fragments [See also 03E30, 03E70]
03F40 Gödel numberings in proof theory
03F50 Metamathematics of constructive systems
03F55 Intuitionistic mathematics
03F60 Constructive and recursive analysis [See also 26E40, 46S30, 47S30]
03F65 Other constructive mathematics [See also 26E40, 46S30, 47S30]
03F99 None of the above, but in this section
03Gxx Algebraic logic
03G05 Boolean algebras [See also 06Exx]
03G10 Lattices and related structures [See also 06Bxx]
03G12 Quantum logic [See also 81P10]
03G15 Cylindric and polyadic algebras; relation algebras
03G20 Łukasiewicz and Post algebras [See also 06D25, 06D30]
03G25 Other algebras related to logic [See also 06F35]
03G30 Categorical logic, topoi [See also 18B25]
03G99 None of the above, but in this section
03Hxx Nonstandard models [See also 03C62]
03H05 Nonstandard models in mathematics [See also 26E35, 28E05, 30G06, 46S20, 47S20, 54J05]
03H10 Other applications of nonstandard models (economics, physics, etc.)
03H15 Nonstandard models of arithmetic [See also 11U10, 12L15, 13L05]
03H99 None of the above, but in this section

04–XX SET THEORY [See also 03Exx]
04–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
04–01 Instructional exposition (textbooks, tutorial papers, etc.)
04–02 Research exposition (monographs, survey articles)
04–03 Historical (must also be assigned at least one classification number from Section 01)
04–04 Explicit machine computation and programs (not the theory of computation or programming)
04–06 Proceedings, conferences, collections, etc.
04A03 Set algebra
04A05 Relations, functions [See also 08A02]
04A10 Ordinal and cardinal numbers; generalizations [See also 03E10]
04A15 Descriptive set theory; Borel classifications, Suslin schemes, etc. [See also 03E15, 26A21, 28A05, 54H05]
04A20 Combinatorial set theory [See also 03E05, 05A05]; filters
04A25 Axiom of choice and equivalent propositions (Zorn's lemma, etc.) [See also 03E25]
04A30 Continuum hypothesis, generalized continuum hypothesis [See also 03E50, 54A25]
04A72 Fuzzy sets, fuzzy relations [See also 03E72, 94D05] {For fuzzy versions, see specific sections}
04A99 Miscellaneous topics

05–XX COMBINATORICS {For finite fields, see 11Txx}
05–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
05–01 Instructional exposition (textbooks, tutorial papers, etc.)
05–02 Research exposition (monographs, survey articles)
05–03 Historical (must also be assigned at least one classification number from Section 01)
05–04 Explicit machine computation and programs (not the theory of computation or programming)
05–06 Proceedings, conferences, collections, etc.
05Axx Classical combinatorial problems
05A05 Combinatorial choice problems (subsets, representatives, permutations)
05A10 Factorials, binomial coefficients, combinatorial functions [See also 11B65, 33Cxx]
05A15 Exact enumeration problems, generating functions [See also 33Cxx, 33Dxx]
05A16 Asymptotic enumeration
05A17 Partitions of integers [See also 11P81, 11P82, 11P83]
05A18 Partitions of sets
05A19 Combinatorial identities
05A20 Combinatorial inequalities
05A30 q-calculus and related topics [See also 03Dxx]
05A40 Umbral calculus
05A99 None of the above, but in this section
05Bxx Designs and configurations {For applications of design theory, see 94C30}
05B05 Block designs [See also 51E05, 62K10]
05B07 Triple systems
05B10 Difference sets (number-theoretic, group-theoretic, etc.) [See also 11B13]
05B15 Orthogonal arrays, Latin squares, Room squares
05B20 Matrices (incidence, Hadamard, etc.)
05B25 Finite geometries [See also 51D20, 51Exx]
05B30 Other designs, configurations [See also 51E30]
05B35 Matroids, geometric lattices [See also 52B40, 90C27]
05B40 Packing and covering [See also 11H31, 52C15, 52C17]

05B45 Tessellation and tiling problems [See also 52C20, 52C22]
05B50 Polyominoes
05B99 None of the above, but in this section
05Cxx Graph theory {For applications of graphs, see 68Q90, 68R10, 90C35, 94C15}
05C05 Trees
05C10 Topological graph theory, embedding [See also 57M15, 57M25]
05C12 Distance in graphs
05C15 Chromatic theory of graphs and maps
05C20 Directed graphs (digraphs), tournaments
05C25 Graphs and groups [See also 20F32]
05C30 Enumeration of graphs and maps
05C35 Extremal problems [See also 90C35]
05C38 Paths and cycles [See also 90B10]
05C40 Connectivity
05C45 Eulerian and Hamiltonian graphs
05C50 Graphs and matrices
05C55 Generalized Ramsey theory
05C60 Isomorphism problems (reconstruction conjecture, perfect graphs, etc.)
05C65 Hypergraphs
05C70 Factorization, matching, covering and packing
05C75 Structural characterization of types of graphs
05C78 Graph labelling (graceful graphs, bandwidth, etc.)
05C80 Random graphs
05C85 Graph algorithms [See also 68Q20, 68R10]
05C90 Applications
05C99 None of the above, but in this section
05Dxx Extremal combinatorics
05D05 Extremal set theory
05D10 Ramsey theory
05D15 Transversal (matching) theory
05D99 None of the above, but in this section
05Exx Algebraic combinatorics
05E05 Symmetric functions
05E10 Tableaux, representations of the symmetric group [See also 20C30]
05E15 Combinatorial problems concerning the classical groups [See also 22E45, 33C80]
05E20 Group actions on designs, geometries and codes
05E25 Group actions on posets and homology groups of posets [See also 06A09]
05E30 Association schemes, strongly regular graphs
05E35 Orthogonal polynomials [See also 33C45, 33C50, 33D45]
05E99 None of the above, but in this section

06–XX ORDER, LATTICES, ORDERED ALGEBRAIC STRUCTURES [See also 18B35]
06–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
06–01 Instructional exposition (textbooks, tutorial papers, etc.)
06–02 Research exposition (monographs, survey articles)
06–03 Historical (must also be assigned at least one classification number from Section 01)
06–04 Explicit machine computation and programs (not the theory of computation or programming)
06–06 Proceedings, conferences, collections, etc.
06Axx Ordered sets
06A05 Total order
06A06 Partial order, general
06A07 Combinatorics of partially ordered sets
06A08 Shellable posets, Cohen-Macaulay posets [See also 52B20]
06A09 Cohomology of posets [See also 05E25]
06A12 Semilattices [See also 20M10]
06A15 Galois correspondences, closure operators
06A23 Complete lattices, completions
06A99 None of the above, but in this section
06Bxx Lattices [See also 03G10]
06B05 Structure theory
06B10 Ideals, congruence relations
06B15 Representation theory
06B20 Varieties of lattices
06B25 Free lattices, projective lattices, word problems [See also 03D40, 08A50, 20F10]
06B30 Topological lattices, order topologies [See also 06F30, 22A26, 54F05, 54H12]
06B35 Continuous lattices, generalizations, applications [See also 06B30, 06D10, 06F30, 18B35, 22A26, 68Q55]
06B99 None of the above, but in this section
06Cxx Modular lattices, complemented lattices
06C05 Modular lattices, Desarguesian lattices
06C10 Semimodular lattices, geometric lattices
06C15 Complemented lattices, orthocomplemented lattices
06C20 Complemented modular lattices, continuous geometries
06C99 None of the above, but in this section
06Dxx Distributive lattices
06D05 Structure and representation theory
06D10 Complete distributivity
06D15 Pseudocomplemented lattices
06D20 Heyting algebras [See also 03Gxx]
06D25 Post algebras [See also 03G20]
06D30 De Morgan algebras, Łukasiewicz algebras [See also 03G20]
06D99 None of the above, but in this section
06Exx Boolean algebras (Boolean rings) [See also 03G05]
06E05 Structure theory
06E10 Chain conditions, complete algebras
06E15 Stone space and related constructions
06E20 Ring-theoretic properties [See also 16E50, 16G30]
06E25 Boolean algebras with additional operations (diagonalizable algebras, etc.)
06E30 Boolean functions [See also 94C10]
06E99 None of the above, but in this section
06Fxx Ordered structures
06F05 Ordered semigroups [See also 20Mxx]
06F10 Noether lattices
06F15 Ordered groups [See also 20F60]
06F20 Ordered abelian groups, Riesz groups, ordered linear spaces [See also 46A40]
06F25 Ordered rings, algebras, modules {For ordered fields, see 12J15; see also 13J25, 16W80}
06F30 Topological lattices, order topologies [See also 06B30, 22A26, 54F05, 54H12]
06F35 BCK-algebras, BCI-algebras [See also 03G25]
06F99 None of the above, but in this section

08–XX GENERAL ALGEBRAIC SYSTEMS
08–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
08–01 Instructional exposition (textbooks, tutorial papers, etc.)
08–02 Research exposition (monographs, survey articles)
08–03 Historical (must also be assigned at least one classification number from Section 01)
08–04 Explicit machine computation and programs (not the theory of computation or programming)
08–06 Proceedings, conferences, collections, etc.
08Axx Algebraic structures [See also 03C05]
08A02 Relational systems, laws of composition
08A05 Structure theory
08A30 Subalgebras, congruence relations
08A35 Automorphisms, endomorphisms
08A40 Operations, polynomials, primal algebras
08A45 Equational compactness
08A50 Word problems [See also 03D40, 06B25, 20F10, 68R15]
08A55 Partial algebras
08A60 Unary algebras
08A62 Finitary algebras
08A65 Infinitary algebras
08A70 Applications of universal algebra in computer science
08A99 None of the above, but in this section
08Bxx Varieties
08B05 Equational logic, Mal′cev (Mal′tsev) conditions
08B10 Congruence modularity, congruence distributivity
08B15 Lattices of varieties
08B20 Free algebras
08B25 Products, amalgamated products, and other kinds of limits and colimits [See also 18A30]
08B26 Subdirect products and subdirect irreducibility
08B30 Injectives, projectives
08B99 None of the above, but in this section
08Cxx Other classes of algebras
08C05 Categories of algebras [See also 18C05]
08C10 Axiomatic model classes [See also 03Cxx, in particular 03C60]
08C15 Quasivarieties
08C99 None of the above, but in this section

11–XX NUMBER THEORY
11–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
11–01 Instructional exposition (textbooks, tutorial papers, etc.)
11–02 Research exposition (monographs, survey articles)
11–03 Historical (must also be assigned at least one classification number from Section 01)
11–04 Explicit machine computation and programs (not the theory of computation or programming)
11–06 Proceedings, conferences, collections, etc.
11Axx Elementary number theory {For analogues in number fields, see 11R04}
11A05 Multiplicative structure; Euclidean algorithm; greatest common divisors
11A07 Congruences; primitive roots; residue systems
11A15 Power residues, reciprocity

11A25 Arithmetic functions; related numbers; inversion formulas
11A41 Primes
11A51 Factorization; primality
11A55 Continued fractions {For approximation results, see 11J70; see also 11K50, 30B70, 40A15}
11A63 Radix representation; digital problems {For metric results, see 11K16}
11A67 Other representations
11A99 None of the above, but in this section
11Bxx Sequences and sets
11B05 Density, gaps, topology
11B13 Additive bases [See also 05B10]
11B25 Arithmetic progressions [See also 11N13]
11B34 Representation functions
11B37 Recurrences {For applications to special functions, see 33–XX}
11B39 Fibonacci and Lucas numbers and polynomials and generalizations
11B50 Sequences (mod m)
11B57 Farey sequences; the sequences $\{1^k, 2^k, \cdots\}$
11B65 Binomial coefficients; factorials; q-identities [See also 05A10, 05A30]
11B68 Bernoulli and Euler numbers and polynomials
11B73 Bell and Stirling numbers
11B75 Other combinatorial number theory
11B83 Special sequences and polynomials
11B85 Automata sequences
11B99 None of the above, but in this section
11Cxx Polynomials and matrices
11C08 Polynomials [See also 13F20]
11C20 Matrices, determinants [See also 15A36]
11C99 None of the above, but in this section
11Dxx Diophantine equations [See also 11Gxx, 14Gxx]
11D04 Linear equations
11D09 Quadratic and bilinear equations
11D25 Cubic and quartic equations
11D41 Higher degree equations; Fermat's equation
11D57 Multiplicative and norm form equations
11D61 Exponential equations
11D68 Rational numbers as sums of fractions
11D72 Equations in many variables [See also 11P55]
11D75 Diophantine inequalities [See also 11J25]
11D79 Congruences in many variables
11D85 Representation problems [See also 11P55]
11D88 p-adic and power series fields
11D99 None of the above, but in this section
11Exx Forms and linear algebraic groups [See also 19Gxx] {For quadratic forms in linear algebra, see 15A63}
11E04 Quadratic forms over general fields
11E08 Quadratic forms over local rings and fields
11E10 Forms over real fields
11E12 Quadratic forms over global rings and fields
11E16 General binary quadratic forms
11E20 General ternary and quaternary quadratic forms; forms of more than two variables
11E25 Sums of squares and representations by other particular quadratic forms
11E39 Bilinear and Hermitian forms
11E41 Class numbers of quadratic and Hermitian forms
11E45 Analytic theory (Epstein zeta functions; relations with automorphic forms and functions)
11E57 Classical groups [See also 14Lxx, 20Gxx]
11E70 K-theory of quadratic and Hermitian forms
11E72 Galois cohomology of linear algebraic groups [See also 20G10]
11E76 Forms of degree higher than two
11E81 Algebraic theory of quadratic forms; Witt groups and rings [See also 19G12, 19G24]
11E88 Quadratic spaces; Clifford algebras [See also 15A63, 15A66]
11E95 p-adic theory
11E99 None of the above, but in this section
11Fxx Discontinuous groups and automorphic forms [See also 11R39, 11S37, 14Gxx, 14Kxx, 22E50, 22E55, 30F35, 32Nxx; for relations with quadratic forms, see 11E45]
11F03 Modular and automorphic functions
11F06 Structure of modular groups and generalizations; arithmetic groups [See also 20H05, 20H10, 22E40]
11F11 Modular forms, one variable
11F12 Automorphic forms, one variable
11F20 Dedekind eta function, Dedekind sums
11F22 Relationship to Lie algebras and finite simple groups
11F25 Hecke-Petersson operators, differential operators (one variable)
11F27 Theta series; Weil representation
11F30 Fourier coefficients of automorphic forms
11F32 Modular correspondences, etc.
11F33 Congruences for modular and p-adic modular forms [See also 14G20, 22E50]
11F37 Forms of half-integer weight; nonholomorphic modular forms
11F41 Hilbert and Hilbert-Siegel modular groups and their modular and automorphic forms; Hilbert modular surfaces [See also 14J20]
11F46 Siegel modular groups and their modular and automorphic forms
11F55 Other groups and their modular and automorphic forms (several variables)
11F60 Hecke-Petersson operators, differential operators (several variables)
11F66 Dirichlet series and functional equations in connection with modular forms
11F67 Special values of automorphic L-series, periods of modular forms, cohomology, modular symbols
11F70 Representation-theoretic methods; automorphic representations over local and global fields
11F72 Spectral theory; Selberg trace formula
11F75 Cohomology of arithmetic groups
11F80 Galois properties
11F85 p-adic theory, local fields [See also 14G20, 22E50]
11F99 None of the above, but in this section
11Gxx Arithmetic algebraic geometry (Diophantine geometry) [See also 11Dxx, 14Gxx, 14Kxx]
11G05 Elliptic curves over global fields [See also 14H52]
11G07 Elliptic curves over local fields [See also 14G20, 14H52]
11G09 Drinfel′d modules; higher-dimensional motives, etc. [See also 14L05]
11G10 Abelian varieties of dimension >1 [See also 14Kxx]
11G15 Complex multiplication and moduli of abelian varieties [See also 14K22]
11G16 Elliptic and modular units [See also 11R27]
11G18 Arithmetic aspects of modular and Shimura varieties [See also 14G35]
11G20 Curves over finite and local fields [See also 14H25]
11G25 Varieties over finite and local fields [See also 14G15, 14G20]
11G30 Curves of arbitrary genus or genus $\neq 1$ over global fields [See also 14H25]
11G35 Varieties over global fields [See also 14G25]
11G40 L-functions of varieties over global fields; Birch-Swinnerton-Dyer conjecture [See also 14G10]
11G45 Geometric class field theory [See also 11R37, 14C35, 19F05]
11G99 None of the above, but in this section
11Hxx Geometry of numbers {For applications in coding theory, see 94B75}
11H06 Lattices and convex bodies [See also 11P21, 52C05, 52C07]
11H16 Nonconvex bodies
11H31 Lattice packing and covering [See also 05B40, 52C15, 52C17]
11H46 Products of linear forms
11H50 Minima of forms
11H55 Quadratic forms (reduction theory, extreme forms, etc.)
11H56 Automorphism groups of lattices
11H60 Mean value and transfer theorems
11H99 None of the above, but in this section
11Jxx Diophantine approximation, transcendental number theory [See also 11K60]
11J04 Homogeneous approximation to one number
11J06 Markov and Lagrange spectra and generalizations
11J13 Simultaneous homogeneous approximation, linear forms
11J17 Approximation by numbers from a fixed field
11J20 Inhomogeneous linear forms
11J25 Diophantine inequalities [See also 11D75]
11J54 Small fractional parts of polynomials and generalizations
11J61 Approximation in non-Archimedean valuations
11J68 Approximation to algebraic numbers
11J70 Continued fractions and generalizations [See also 11A55, 11K50]
11J71 Distribution modulo one [See also 11K06]
11J72 Irrationality; linear independence over a field
11J81 Transcendence (general theory)
11J82 Measures of irrationality and of transcendence
11J83 Metric theory
11J85 Algebraic independence; Gel′fond's method
11J86 Linear forms in logarithms; Baker's method
11J89 Transcendence theory of elliptic and abelian functions
11J91 Transcendence theory of other special functions
11J99 None of the above, but in this section
11Kxx Probabilistic theory: distribution modulo 1; metric theory of algorithms
11K06 General theory of distribution modulo 1 [See also 11J71]
11K16 Normal numbers, radix expansions, etc. [See also 11A63]
11K31 Special sequences
11K36 Well-distributed sequences and other variations
11K38 Irregularities of distribution, discrepancy [See also 11Nxx]
11K41 Continuous, p-adic and abstract analogues
11K45 Pseudo-random numbers; Monte Carlo methods
11K50 Metric theory of continued fractions [See also 11A55, 11J70]
11K55 Metric theory of other algorithms and expansions; measure and Hausdorff dimension [See also 11N99, 28Dxx]
11K60 Diophantine approximation [See also 11Jxx]
11K65 Arithmetic functions [See also 11Nxx]

11K70 Harmonic analysis and almost periodicity
11K99 None of the above, but in this section
11Lxx Exponential sums and character sums {For finite fields, see 11Txx}
11L03 Trigonometric and exponential sums, general
11L05 Gauss and Kloosterman sums; generalizations
11L07 Estimates on exponential sums
11L10 Jacobsthal and Brewer sums; other complete character sums
11L15 Weyl sums
11L20 Sums over primes
11L26 Sums over arbitrary intervals
11L40 Estimates on character sums
11L99 None of the above, but in this section
11Mxx Zeta and L-functions: analytic theory
11M06 $\zeta(s)$ and $L(s,\chi)$
11M20 Real zeros of $L(s,\chi)$; results on $L(1,\chi)$
11M26 Nonreal zeros of $\zeta(s)$ and $L(s,\chi)$; Riemann and other hypotheses
11M35 Hurwitz and Lerch zeta functions
11M36 Selberg zeta functions and regularized determinants
11M41 Other Dirichlet series and zeta functions {For local and global ground fields, see 11R42, 11R52, 11S40, 11S45; for algebro-geometric methods, see 14G10; see also 11E45, 11F66, 11F70, 11F72}
11M45 Tauberian theorems [See also 40E05]
11M99 None of the above, but in this section
11Nxx Multiplicative number theory
11N05 Distribution of primes
11N13 Primes in progressions [See also 11B25]
11N25 Distribution of integers with specified multiplicative constraints
11N30 Turán theory [See also 30Bxx]
11N32 Primes represented by polynomials; other multiplicative structure of polynomial values
11N35 Sieves
11N36 Applications of sieve methods
11N37 Asymptotic results on arithmetic functions
11N45 Asymptotic results on counting functions for algebraic and topological structures
11N56 Rate of growth of arithmetic functions
11N60 Distribution functions associated with additive and positive multiplicative functions
11N64 Other results on the distribution of values or the characterization of arithmetic functions
11N69 Distribution of integers in special residue classes
11N75 Applications of automorphic functions and forms to multiplicative problems [See also 11Fxx]
11N80 Generalized primes and integers
11N99 None of the above, but in this section
11Pxx Additive number theory; partitions
11P05 Waring's problem and variants
11P21 Lattice points in specified regions
11P32 Goldbach-type theorems; other additive questions involving primes
11P55 Applications of the Hardy-Littlewood method [See also 11D85]
11P81 Elementary theory of partitions [See also 05A17]
11P82 Analytic theory of partitions
11P83 Partitions; congruences and congruential restrictions
11P99 None of the above, but in this section
11Rxx Algebraic number theory: global fields {For complex multiplication, see 11G15}
11R04 Algebraic numbers; rings of algebraic integers
11R06 PV-numbers and generalizations; other special algebraic numbers
11R09 Polynomials (irreducibility, etc.)
11R11 Quadratic extensions
11R16 Cubic and quartic extensions
11R18 Cyclotomic extensions
11R20 Other abelian and metabelian extensions
11R21 Other number fields
11R23 Iwasawa theory
11R27 Units and factorization
11R29 Class numbers, class groups, discriminants
11R32 Galois theory
11R33 Integral representations related to algebraic numbers; Galois module structure of rings of integers [See also 20C10]
11R34 Galois cohomology [See also 12Gxx, 16H05, 19A31]
11R37 Class field theory
11R39 Langlands-Weil conjectures, nonabelian class field theory [See also 11Fxx, 22E55]
11R42 Zeta functions and L-functions of number fields [See also 11M41, 19F27]
11R44 Distribution of prime ideals [See also 11N05]
11R45 Density theorems
11R47 Other analytic theory [See also 11Nxx]
11R52 Quaternion and other division algebras: arithmetic, zeta functions
11R54 Other algebras and orders, and their zeta and L-functions [See also 11S45, 16H05, 16Kxx]
11R56 Adèle rings and groups
11R58 Arithmetic theory of algebraic function fields [See also 14–XX]
11R65 Class groups and Picard groups of orders
11R70 K-theory of global fields [See also 19Fxx]
11R80 Totally real and totally positive fields [See also 12J15]
11R99 None of the above, but in this section
11Sxx Algebraic number theory: local and p-adic fields
11S05 Polynomials
11S15 Ramification and extension theory
11S20 Galois theory
11S23 Integral representations
11S25 Galois cohomology [See also 12Gxx, 16H05]
11S31 Class field theory; p-adic formal groups [See also 14L05]
11S37 Langlands-Weil conjectures, nonabelian class field theory [See also 11Fxx, 22E50]
11S40 Zeta functions and L-functions [See also 11M41, 19F27]
11S45 Algebras and orders, and their zeta functions [See also 11R52, 11R54, 16H05, 16Kxx]
11S70 K-theory of local fields [See also 19Fxx]
11S80 Other analytic theory (analogues of beta and gamma functions, p-adic integration, etc.)
11S85 Other nonanalytic theory
11S99 None of the above, but in this section
11Txx Finite fields and commutative rings (number-theoretic aspects)
11T06 Polynomials
11T22 Cyclotomy
11T23 Exponential sums
11T24 Other character sums and Gauss sums
11T30 Structure theory
11T55 Arithmetic theory of polynomial rings over finite fields
11T71 Algebraic coding theory; cryptography
11T99 None of the above, but in this section
11Uxx Connections with logic
11U05 Decidability [See also 03B25]
11U07 Ultraproducts [See also 03C20]
11U09 Model theory [See also 03Cxx]
11U10 Nonstandard arithmetic [See also 03H15]
11U99 None of the above, but in this section
11Yxx Computational number theory [See also 11–04]
11Y05 Factorization
11Y11 Primality
11Y16 Algorithms; complexity [See also 68Q25]
11Y35 Analytic computations
11Y40 Algebraic number theory computations
11Y50 Computer solution of Diophantine equations
11Y55 Calculation of integer sequences
11Y60 Evaluation of constants
11Y65 Continued fraction calculations
11Y70 Values of arithmetic functions; tables
11Y99 None of the above, but in this section
11Z05 Miscellaneous applications of number theory

12–XX FIELD THEORY AND POLYNOMIALS
12–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
12–01 Instructional exposition (textbooks, tutorial papers, etc.)
12–02 Research exposition (monographs, survey articles)
12–03 Historical (must also be assigned at least one classification number from Section 01)
12–04 Explicit machine computation and programs (not the theory of computation or programming)
12–06 Proceedings, conferences, collections, etc.
12Dxx Real and complex fields
12D05 Polynomials: factorization
12D10 Polynomials: location of zeros (algebraic theorems) {For the analytic theory, see 26C10, 30C15}
12D15 Fields related with sums of squares (formally real fields, Pythagorean fields, etc.) [See also 11Exx]
12D99 None of the above, but in this section
12Exx General field theory
12E05 Polynomials (irreducibility, etc.)
12E10 Special polynomials
12E12 Equations
12E15 Skew fields, division rings [See also 11R52, 11R54, 11S45, 16Kxx]
12E20 Finite fields (field-theoretic aspects)
12E25 Hilbertian fields; Hilbert's irreducibility theorem
12E99 None of the above, but in this section
12Fxx Field extensions
12F05 Algebraic extensions
12F10 Separable extensions, Galois theory
12F12 Inverse Galois theory
12F15 Inseparable extensions
12F20 Transcendental extensions
12F99 None of the above, but in this section

12Gxx Homological methods (in field theory)
12G05 Galois cohomology [See also 13A20, 16H05]
12G10 Cohomological dimension
12G99 None of the above, but in this section
12Hxx Differential and difference algebra
12H05 Differential algebra [See also 13Nxx]
12H10 Difference algebra [See also 39Axx]
12H20 Abstract differential equations [See also 34Gxx]
12H25 p-adic differential equations [See also 11S80, 14G20, 34Gxx]
12H99 None of the above, but in this section
12Jxx Topological fields
12J05 Normed fields
12J10 Valued fields
12J12 Formally p-adic fields
12J15 Ordered fields
12J17 Topological semifields
12J20 General valuation theory
12J25 Non-Archimedean valued fields [See also 30G06, 32P05, 46S10, 47S10]
12J27 Krasner-Tate algebras [See mainly 32P05; see also 46S10, 47S10]
12J99 None of the above, but in this section
12Kxx Generalizations of fields
12K05 Near-fields [See also 16Y30]
12K10 Semifields [See also 16Y60]
12K99 None of the above, but in this section
12Lxx Connections with logic
12L05 Decidability [See also 03B25]
12L10 Ultraproducts [See also 03C20]
12L12 Model theory [See also 03C60]
12L15 Nonstandard arithmetic [See also 03H15]
12L99 None of the above, but in this section
12Y05 Computational aspects of field theory and polynomials

13–XX COMMUTATIVE RINGS AND ALGEBRAS
13–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
13–01 Instructional exposition (textbooks, tutorial papers, etc.)
13–02 Research exposition (monographs, survey articles)
13–03 Historical (must also be assigned at least one classification number from Section 01)
13–04 Explicit machine computation and programs (not the theory of computation or programming)
13–06 Proceedings, conferences, collections, etc.
13Axx General commutative ring theory
13A02 Graded rings [See also 16W50]
13A05 Divisibility
13A10 Radical theory
13A15 Ideals; multiplicative ideal theory
13A18 Valuations and their generalizations
13A20 Brauer groups [See also 12Gxx, 16H05]
13A30 Associated graded rings of ideals (Rees ring, form ring) and related topics
13A35 Characteristic p methods (Frobenius endomorphism) and reduction to characteristic p [See also 13Mxx]
13A50 Invariant theory [See also 14D25]
13A99 None of the above, but in this section
13Bxx Ring extensions and related topics
13B02 Extension theory
13B05 Galois theory (commutative rings)
13B10 Morphisms and derivations
13B15 Ramification theory
13B21 Integral dependence
13B22 Integral closure; integrally closed rings, related rings (Japanese, etc.)
13B24 Going up; going down; going between
13B25 Polynomials over commutative rings
13B30 Quotients and localization
13B35 Completion [See also 13J10]
13B40 Étale extensions and Henselization; Artin approximation [See also 13J15, 14B12]
13B99 None of the above, but in this section
13Cxx Theory of modules and ideals
13C05 Structure, classification theorems
13C10 Projective and free modules and ideals [See also 18G05, 19A13]
13C11 Injective and flat modules and ideals [See also 18G05]
13C12 Torsion modules and ideals
13C13 Other special types
13C14 Cohen-Macaulay modules [See also 13H10]
13C15 Dimension theory, depth, related rings (catenary, etc.)
13C20 Class groups
13C40 Linkage, complete intersections and determinantal ideals [See also 14M12]
13C99 None of the above, but in this section
13Dxx (Co)homological methods
13D02 Syzygies
13D03 (Co)homology of commutative rings and algebras
13D05 (Co)homological dimension [See also 18G20]
13D10 Deformations and infinitesimal methods [See also 14B12, 14D15, 16S80, 32Gxx]
13D15 Grothendieck groups, K-theory [See also 14C35, 18F30, 19–XX]
13D25 Complexes
13D30 Torsion theory [See also 13C12, 18E40]
13D40 Hilbert-Samuel functions and Poincaré series
13D45 Local cohomology [See also 14B15]
13D99 None of the above, but in this section
13Exx Chain conditions, finiteness conditions
13E05 Noetherian rings and modules
13E10 Artinian rings and modules, finite-dimensional algebras
13E15 Rings and modules of finite generation or presentation
13E99 None of the above, but in this section
13Fxx Arithmetic rings and other special rings [See also 12–XX]
13F05 Dedekind and Prüfer rings and their generalizations
13F07 Euclidean rings and generalizations
13F10 Principal ideal rings
13F15 Factorial rings, unique factorization domains [See also 14M05]
13F20 Polynomial rings and ideals [See also 11C08]
13F25 Formal power series rings [See also 13J05]
13F30 Valuation rings
13F40 Excellent rings
13F45 Seminormal rings
13F50 Rings with straightening laws, Hodge algebras
13F99 None of the above, but in this section
13G05 Integral domains
13Hxx Local rings and semilocal rings
13H05 Regular local rings
13H10 Special types (Cohen-Macaulay, Gorenstein, Buchsbaum, etc.) [See also 14M05]
13H15 Multiplicity theory and related topics
13H99 None of the above, but in this section
13Jxx Topological rings and modules [See also 16W60, 16W80]
13J05 Power series rings [See also 13F25]
13J07 Analytical algebras and rings [See also 32B05]
13J10 Complete rings, completion [See also 13B35]
13J15 Henselian rings [See also 13B40]
13J20 Global topological rings
13J25 Ordered rings [See also 06F25]
13J99 None of the above, but in this section
13K05 Witt vectors and related rings
13L05 Applications of logic to commutative algebra [See also 03Cxx, 03Hxx]
13Mxx Finite commutative rings {For number-theoretic aspects, see 11Txx}
13M05 Structure
13M10 Polynomials (commutative rings)
13M99 None of the above, but in this section
13Nxx Differential algebra [See also 12H05, 14F10]
13N05 Modules of differentials [See also 16S32]
13N10 Rings of differential operators [See also 16S32, 32C38]
13N99 None of the above, but in this section
13Pxx Computational aspects of commutative algebra [See also 68Q40]
13P05 Polynomials, factorization [See also 12Y05]
13P10 Polynomial ideals, Gröbner bases
13P99 None of the above, but in this section

14–XX ALGEBRAIC GEOMETRY
14–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
14–01 Instructional exposition (textbooks, tutorial papers, etc.)
14–02 Research exposition (monographs, survey articles)
14–03 Historical (must also be assigned at least one classification number from Section 01)
14–04 Explicit machine computation and programs (not the theory of computation or programming)
14–06 Proceedings, conferences, collections, etc.
14Axx Foundations
14A05 Relevant commutative algebra [See also 13–XX]
14A10 Varieties
14A15 Schemes
14A20 Generalizations (algebraic spaces, motifs)
14A22 Noncommutative algebraic geometry; algebraic supervarieties [See also 14M30, 32C11, 58A50]
14A25 Elementary questions
14A99 None of the above, but in this section
14Bxx Local theory [See also 32Sxx]
14B05 Singularities [See also 14E15, 14H20, 32Sxx, 58C27]
14B07 Deformations of singularities [See also 14D15, 32Sxx]
14B10 Infinitesimal methods [See also 13D10]

14B12 Local deformation theory, Artin approximation, etc. [See also 13B40, 13D10]
14B15 Local cohomology [See also 13D45, 32C36]
14B20 Formal neighborhoods
14B99 None of the above, but in this section
14Cxx Cycles and subschemes
14C05 Parametrization (Chow and Hilbert schemes)
14C10 Equivalence relations
14C15 Rational equivalence rings
14C17 Intersection theory
14C20 Divisors, linear systems, invertible sheaves
14C21 Pencils, nets, webs [See also 53A60]
14C22 Picard groups
14C25 Algebraic cycles
14C30 Transcendental methods, Hodge theory [See also 14D07, 32G20, 32J25, 32S35], Hodge conjecture
14C34 Torelli problem [See also 32G20]
14C35 Applications of methods of algebraic K-theory [See also 14F05, 19Exx]
14C40 Riemann-Roch theorems [See also 19E20, 19L10]
14C99 None of the above, but in this section
14Dxx Families, fibrations
14D05 Structure of families (Picard-Lefschetz, Picard-Fuchs theory, etc.)
14D07 Variation of Hodge structures
14D10 Arithmetic ground fields (finite, local, global)
14D15 Formal methods; deformations [See also 13D10, 14B07, 16S80, 32Gxx]
14D20 Algebraic moduli problems, moduli of vector bundles {For analytic moduli problems, see 32G13}
14D22 Fine and coarse moduli spaces
14D25 Geometric invariants [See also 14L30]
14D99 None of the above, but in this section
14Exx Mappings and correspondences
14E05 Rational maps, birational correspondences
14E07 Birational automorphisms, Cremona group and generalizations [See also 32G20]
14E09 Automorphisms [See also 14J50, 14L27]
14E10 General correspondences
14E15 Global theory of singularities, resolution [See also 14B05, 32S20, 32S45]
14E20 Coverings, fundamental group (mappings)
14E22 Ramification problems [See also 11S15]
14E25 Embeddings
14E30 Minimal models
14E35 Results in dimension ≤ 3
14E40 Local structure of maps: étale, flat, etc. [See also 13–XX, 14F20]
14E99 None of the above, but in this section
14Fxx (Co)homology theory [See also 13Dxx]
14F05 Vector bundles, sheaves, related construction [See also 18F20, 32Lxx, 46M20]
14F10 Differentials and other special sheaves [See also 32C38]
14F17 Vanishing theorems [See also 32L20]
14F20 Étale and other Grothendieck topologies and cohomologies
14F25 Classical real and complex cohomology
14F30 p-adic cohomology, crystalline cohomology
14F32 Intersection (co)homology [See also 32S60]
14F35 Homotopy theory; fundamental groups [See also 14E20, 14H30]
14F40 de Rham cohomology [See also 14C30, 32C35, 32L10]
14F45 Topological properties
14F99 None of the above, but in this section
14Gxx Arithmetic problems. Diophantine geometry [See also 11Dxx, 11Gxx]
14G05 Rationality questions, rational points
14G10 Zeta-functions and related questions [See also 11G40] (Birch-Swinnerton-Dyer conjecture)
14G15 Finite ground fields
14G20 p-adic ground fields
14G25 Global ground fields
14G27 Nonalgebraically closed ground fields
14G35 Modular and Shimura varieties [See also 11F41, 11F46, 11G18]
14G40 Arithmetic varieties and schemes; Arakelov theory
14G99 None of the above, but in this section
14Hxx Curves
14H05 Algebraic functions; function fields [See also 11R58]
14H10 Families, moduli (algebraic)
14H15 Families, moduli (analytic) [See also 30F10, 32Gxx]
14H20 Singularities, local rings [See also 13Hxx]
14H25 Arithmetic ground fields [See also 11Dxx, 11G05, 14Gxx]
14H30 Coverings, fundamental group [See also 14E20, 14F35]
14H35 Correspondences [See also 14Exx]
14H40 Jacobians [See also 32G20]
14H42 Theta functions; Schottky problem [See also 14K25, 32G20]
14H45 Special curves and curves of low genus
14H50 Space curves
14H52 Elliptic curves [See also 11G05, 11G07, 14Kxx]
14H55 Riemann surfaces; Weierstrass points; gap sequences [See also 30Fxx]
14H60 Vector bundles on curves [See also 14F05]
14H99 None of the above, but in this section
14Jxx Surfaces and higher-dimensional varieties {For analytic theory, see 32Jxx}
14J05 Picard group [See also 14C22, 19A49, 32L05]
14J10 Families, moduli, classification: algebraic theory
14J15 Moduli, classification: analytic theory [See also 32G13, 32J15]
14J17 Singularities of surfaces
14J20 Arithmetic ground fields [See also 11Dxx, 11G25, 11G35, 14Gxx]
14J25 Special surfaces {For Hilbert modular surfaces, see 14G35}
14J26 Rational and ruled surfaces
14J27 Elliptic surfaces
14J28 $K3$ surfaces and Enriques surfaces
14J29 Surfaces of general type
14J30 Special 3-folds [See also 14E05]
14J32 Calabi-Yau manifolds
14J35 Special 4-folds [See also 14E05]
14J40 Special n-folds
14J45 Fano varieties
14J50 Automorphisms of surfaces and higher-dimensional varieties [See also 14E09]
14J60 Vector bundles on surfaces and higher-dimensional varieties [See also 14F05, 32Lxx]
14J70 Hypersurfaces
14J99 None of the above, but in this section
14Kxx Abelian varieties and schemes
14K02 Isogeny
14K05 Algebraic theory
14K10 Algebraic moduli, classification
14K15 Arithmetic ground fields [See also 11Dxx, 11Fxx, 11Gxx, 14Gxx]
14K20 Analytic theory; abelian integrals and differentials
14K22 Complex multiplication [See also 11G15]
14K25 Theta functions
14K30 Picard schemes, higher Jacobians [See also 14H40, 32G20]
14K99 None of the above, but in this section
14Lxx Group schemes {For linear algebraic groups, see 20Gxx. For Lie algebras, see 17B45}
14L05 Formal groups, p-divisible groups [See also 55N22]
14L10 Group varieties
14L15 Group schemes
14L17 Affine algebraic groups, hyperalgebra constructions [See also 17B45, 18D35]
14L27 Automorphism groups [See also 14E09]
14L30 Group actions on varieties or schemes (quotients) [See also 14D25]
14L35 Classical groups (geometric aspects) [See also 20Gxx, 51N30]
14L40 Other algebraic groups (geometric aspects)
14L99 None of the above, but in this section
14Mxx Special varieties
14M05 Varieties defined by ring conditions (factorial, Cohen-Macaulay, seminormal) [See also 13C14, 13F45, 13H10]
14M06 Linkage [See also 13C40]
14M07 Low-codimension problems [See also 14Cxx]
14M10 Complete intersections [See also 13C40]
14M12 Determinantal varieties [See also 13C40]
14M15 Grassmannians, Schubert varieties, flag manifolds [See also 32M10, 51M35]
14M17 Homogeneous spaces and generalizations [See also 32M10, 53C30, 57T15]
14M20 Rational varieties
14M25 Toric varieties, Newton polyhedra
14M30 Supervarieties [See also 14A22, 32C11, 58A50]
14M99 None of the above, but in this section
14Nxx Classical methods and problems [See also 51–XX]
14N05 Projective techniques [See also 51N35]
14N10 Enumerative problems (combinatorial problems)
14N99 None of the above, but in this section
14Pxx Real algebraic and real analytic geometry
14P05 Real algebraic sets [See also 12Dxx]
14P10 Semialgebraic sets and related spaces
14P15 Real analytic and semianalytic sets [See also 32B20, 32C05]
14P20 Nash functions and manifolds [See also 32C07, 58A07]
14P25 Topology of real algebraic varieties
14P99 None of the above, but in this section
14Qxx Computational aspects in algebraic geometry [See also 12–04, 68Q40]
14Q05 Curves
14Q10 Surfaces, hypersurfaces
14Q15 Higher-dimensional varieties
14Q20 Effectivity
14Q99 None of the above, but in this section

15–XX LINEAR AND MULTILINEAR ALGEBRA; MATRIX THEORY (finite and infinite)
- 15–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
- 15–01 Instructional exposition (textbooks, tutorial papers, etc.)
- 15–02 Research exposition (monographs, survey articles)
- 15–03 Historical (must also be assigned at least one classification number from Section 01)
- 15–04 Explicit machine computation and programs (not the theory of computation or programming)
- 15–06 Proceedings, conferences, collections, etc.
- 15A03 Vector spaces, linear dependence, rank
- 15A04 Linear transformations, semilinear transformations
- 15A06 Linear equations
- 15A09 Matrix inversion, generalized inverses
- 15A12 Conditioning of matrices [See also 65F35]
- 15A15 Determinants, permanents, other special matrix functions [See also 19B10, 19B14]
- 15A18 Eigenvalues, singular values, and eigenvectors
- 15A21 Canonical forms, reductions, classification
- 15A22 Matrix pencils [See also 47A56]
- 15A23 Factorization of matrices
- 15A24 Matrix equations and identities
- 15A27 Commutativity
- 15A30 Algebraic systems of matrices [See also 16S50, 20Gxx, 20Hxx]
- 15A33 Matrices over special rings (quaternions, finite fields, etc.)
- 15A36 Matrices of integers [See also 11C20]
- 15A39 Linear inequalities
- 15A42 Inequalities involving eigenvalues and eigenvectors
- 15A45 Miscellaneous inequalities involving matrices
- 15A48 Positive matrices and their generalizations; cones of matrices
- 15A51 Stochastic matrices
- 15A52 Random matrices
- 15A54 Matrices over function rings in one or more variables
- 15A57 Other types of matrices (Hermitian, skew-Hermitian, etc.)
- 15A60 Norms of matrices, numerical range, applications of functional analysis to matrix theory [See also 65F35, 65J05]
- 15A63 Quadratic and bilinear forms, inner products [See mainly 11Exx]
- 15A66 Clifford algebras, spinors
- 15A69 Multilinear algebra, tensor products
- 15A72 Vector and tensor algebra, theory of invariants [See also 13A50, 14D25]
- 15A75 Exterior algebra, Grassmann algebras
- 15A78 Other algebras built from modules
- 15A90 Applications of matrix theory to physics
- 15A99 Miscellaneous topics

16–XX ASSOCIATIVE RINGS AND ALGEBRAS {For the commutative case, see 13–XX}
- 16–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
- 16–01 Instructional exposition (textbooks, tutorial papers, etc.)
- 16–02 Research exposition (monographs, survey articles)
- 16–03 Historical (must also be assigned at least one classification number from Section 01)
- 16–04 Explicit machine computation and programs (not the theory of computation or programming)
- 16–06 Proceedings, conferences, collections, etc.
- 16Bxx General and miscellaneous
- 16B50 Category-theoretic methods and results (except as in 16D90, 16E10) [See also 18–XX]
- 16B70 Applications of logic [See also 03Cxx]
- 16B99 None of the above, but in this section
- 16Dxx Modules, bimodules and ideals
- 16D10 General module theory
- 16D15 1-sided ideals
- 16D20 Bimodules
- 16D25 2-sided ideals
- 16D30 Maximal and prime 2-sided ideals [See also 16N60, 16D60], simple rings (except as in 16Kxx)
- 16D40 Free, projective, and flat modules and ideals [See also 18G05, 19A13]
- 16D50 Injective modules, self-injective rings [See also 16L60, 18G05]
- 16D60 Simple and semisimple modules, primitive rings and ideals
- 16D70 Structure and classification (except as in 16Gxx), direct sum decomposition, cancellation
- 16D80 Other classes of modules and ideals [See also 16G60]
- 16D90 Module categories [See also 16Exx, 16Gxx, 16S90]; module theory in a category-theoretic context; Morita equivalence and duality
- 16D99 None of the above, but in this section
- 16Exx Homological methods and results [See also 18Gxx]
- 16E10 Homological dimension
- 16E20 Grothendieck groups, K-theory, etc. [See also 18F30, 19–XX]
- 16E30 Homological functors on modules
- 16E40 Hochschild and other homology and cohomology theories for rings
- 16E50 von Neumann regular rings and generalizations
- 16E60 Semihereditary and hereditary rings, free ideal rings, Sylvester rings, etc.
- 16E70 Other rings of low global or flat dimension
- 16E99 None of the above, but in this section
- 16Gxx Representation theory of rings and algebras
- 16G10 Representations of Artinian rings
- 16G20 Representations of quivers and partially ordered sets
- 16G30 Representations of orders, lattices, algebras over commutative rings [See also 16H05]
- 16G50 Cohen-Macaulay modules
- 16G60 Representation type (finite, tame, wild, etc.)
- 16G70 Auslander-Reiten sequences (almost split sequences) and Auslander-Reiten quivers
- 16G99 None of the above, but in this section
- 16H05 Orders and arithmetic, separable algebras, Azumaya algebras [See also 11R52, 11R54, 11S45, 13A20]
- 16Kxx Division rings and semisimple Artinian rings [See also 12E15, 15A30]
- 16K20 Finite-dimensional {For Brauer group theory, see 12Gxx, 13A20; for crossed products, see 16S35}
- 16K40 Infinite-dimensional and general
- 16K99 None of the above, but in this section
- 16Lxx Local rings and generalizations
- 16L30 Noncommutative local and semilocal rings, perfect rings
- 16L60 Quasi-Frobenius rings [See also 16D50]
- 16L99 None of the above, but in this section
- 16Nxx Radicals and radical properties of rings
- 16N20 Jacobson radical, quasimultiplication
- 16N40 Nil and nilpotent radicals, sets, ideals, rings
- 16N60 Prime and semiprime rings [See also 16D30, 16D60, 16U10]
- 16N80 General radicals and rings {For radicals in module categories, see 16S90}
- 16N99 None of the above, but in this section
- 16Pxx Chain conditions, growth conditions, and other forms of finiteness
- 16P10 Finite rings and finite-dimensional algebras {For semisimple, see 16K20; for commutative, see 11Txx, 13Mxx}
- 16P20 Artinian rings and modules
- 16P40 Noetherian rings and modules
- 16P50 Localization and Noetherian rings [See also 16U20]
- 16P60 Chain conditions on annihilators and summands: Goldie type conditions [See also 16U20], Krull dimension
- 16P70 Chain conditions on other classes of submodules, ideals, subrings, etc.; coherence
- 16P90 Growth rate, Gel′fand-Kirillov dimension
- 16P99 None of the above, but in this section
- 16Rxx Rings with polynomial identity
- 16R10 T-ideals, identities, varieties of rings and algebras
- 16R20 Semiprime p.i. rings, rings embeddable in matrices over commutative rings
- 16R30 Trace rings and invariant theory
- 16R40 Identities other than those of matrices over commutative rings
- 16R50 Other kinds of identities (generalized polynomial, rational, involution)
- 16R99 None of the above, but in this section
- 16Sxx Rings and algebras arising under various constructions
- 16S10 Rings determined by universal properties (free algebras, coproducts, adjunction of inverses, etc.)
- 16S15 Finite generation, finite presentability, normal forms (diamond lemma, term-rewriting)
- 16S20 Centralizing and normalizing extensions
- 16S30 Universal enveloping algebras of Lie algebras [See mainly 17B35]
- 16S32 Rings of differential operators [See also 13N10, 32C38]
- 16S34 Group rings [See also 20C05, 20C07], Laurent polynomial rings
- 16S35 Twisted and skew group rings, crossed products
- 16S36 Ordinary and skew polynomial rings and semigroup rings [See also 20M25]
- 16S40 Smash products of general Hopf actions [See also 16W30]
- 16S50 Endomorphism rings; matrix rings [See also 15–XX]
- 16S60 Rings of functions, subdirect products, sheaves of rings
- 16S70 Extensions of rings by ideals
- 16S80 Deformations of rings [See also 14D15]
- 16S90 Maximal ring of quotients, torsion theories, radicals on module categories [See also 13D30, 18E40] {For radicals of rings see 16Nxx}
- 16S99 None of the above, but in this section
- 16Uxx Conditions on elements (including elements of matrix rings, etc.)
- 16U10 Integral domains
- 16U20 Ore rings, multiplicative sets, Ore localization
- 16U30 Divisibility, noncommutative UFDs
- 16U50 Algebraicity and local finiteness [See also 16N40]
- 16U60 Units, groups of units, general linear groups
- 16U70 Center, normalizer (invariant elements)
- 16U80 Generalizations of commutativity
- 16U99 None of the above, but in this section

16Wxx Rings and algebras with additional structure
16W10 Rings with involution; Lie, Jordan and other nonassociative structures [See also 17B60, 17C50, 46Kxx]
16W20 Automorphisms and endomorphisms, actions of groups and semigroups and their fixed rings
16W25 Derivations, actions of Lie algebras
16W30 Coalgebras, bialgebras, Hopf algebras [See also 57T05, 16S30–16S40]; rings, modules, etc. on which these act
16W50 Graded rings and modules
16W55 "Super" (or "skew") structure [See also 17A70, 17B70, 17C70] {For exterior algebras, see 15A75; for Clifford algebras, see 11E88, 15A66}
16W60 Filtrations and valuations, generalizations of Euclidean algorithm, completions, formal power series and related constructions [See also 13Jxx]
16W80 Topological and ordered rings and modules [See also 13Jxx]
16W99 None of the above, but in this section
16Yxx Generalizations {For nonassociative rings, see 17–xx}
16Y30 Near-rings [See also 12K05]
16Y60 Semirings [See also 12K10]
16Y99 None of the above, but in this section

17–XX NONASSOCIATIVE RINGS AND ALGEBRAS
17–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
17–01 Instructional exposition (textbooks, tutorial papers, etc.)
17–02 Research exposition (monographs, survey articles)
17–03 Historical (must also be assigned at least one classification number from Section 01)
17–04 Explicit machine computation and programs (not the theory of computation or programming)
17–06 Proceedings, conferences, collections, etc.
17–08 Computational methods
17Axx General nonassociative rings
17A01 General theory
17A05 Power-associative
17A10 Commutative power-associative
17A15 Noncommutative Jordan algebras
17A20 Flexible algebras
17A25 Nodal algebras
17A30 Algebras satisfying other identities
17A35 Division algebras
17A36 Automorphisms, derivations, other operators
17A40 Ternary compositions
17A42 Other n-ary compositions
17A45 Quadratic algebras (but not quadratic Jordan algebras)
17A50 Free algebras
17A60 Structure theory
17A65 Radical theory
17A70 Superalgebras
17A75 Composition algebras
17A80 Valued algebras
17A99 None of the above, but in this section
17Bxx Lie algebras and Lie superalgebras {For Lie groups, see 22Exx}
17B01 Identities, free Lie algebras
17B05 Structure theory
17B10 Representations, algebraic theory (weights)
17B15 Representations, analytic theory
17B20 Simple, semisimple, reductive algebras (roots)
17B25 Exceptional algebras
17B30 Solvable, nilpotent algebras
17B35 Universal enveloping algebras [See also 16S30]
17B37 Quantum groups and related deformations [See also 16W30, 81R50, 82B23]
17B40 Automorphisms, derivations, other operators
17B45 Lie algebras of linear algebraic groups [See also 14Lxx and 20Gxx]
17B50 Modular Lie algebras
17B55 Homological methods in Lie algebras and superalgebras
17B56 Cohomology of Lie algebras and superalgebras
17B60 Lie rings associated with other structures (associative, Jordan, etc.) [See also 15A30, 16W10, 17C40, 17C50]
17B65 Infinite-dimensional Lie algebras and superalgebras [See also 22E65]
17B66 Lie algebras of vector fields and related algebras
17B67 Kac-Moody algebras (structure and representation theory)
17B68 Virasoro and related algebras
17B69 Vertex operators
17B70 Graded Lie algebras
17B81 Applications to physics
17B99 None of the above, but in this section
17Cxx Jordan algebras (algebras, triples and pairs)
17C05 Identities and free Jordan structures
17C10 Structure theory
17C17 Radicals
17C20 Simple, semisimple algebras
17C27 Idempotents, Peirce decompositions
17C30 Associated groups, automorphisms
17C36 Associated manifolds
17C37 Associated geometries
17C40 Exceptional Jordan structures
17C50 Jordan structures associated with other structures [See also 16W10]
17C55 Finite-dimensional structures
17C60 Division algebras
17C65 Jordan structures on Banach spaces and algebras [See also 46H70, 46L70]
17C70 Super structures
17C90 Applications to physics
17C99 None of the above, but in this section
17Dxx Other nonassociative rings and algebras
17D05 Alternative rings
17D10 Mal′cev (Mal′tsev) rings and algebras
17D15 Right alternative rings
17D20 (γ,δ)-rings, including $(1,-1)$-rings
17D25 Lie-admissible algebras
17D92 Genetic algebras
17D99 None of the above, but in this section

18–XX CATEGORY THEORY, HOMOLOGICAL ALGEBRA
18–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
18–01 Instructional exposition (textbooks, tutorial papers, etc.)
18–02 Research exposition (monographs, survey articles)
18–03 Historical (must also be assigned at least one classification number from Section 01)
18–04 Explicit machine computation and programs (not the theory of computation or programming)
18–06 Proceedings, conferences, collections, etc.
18Axx General theory of categories and functors
18A05 Definitions, generalizations
18A10 Graphs, diagram schemes, precategories, neocategories [See also 20Lxx]
18A15 Foundations, relations to logic and deductive systems [See also 03–XX]
18A20 Epimorphisms, monomorphisms, special classes of morphisms, null morphisms, factorization (bicategories)
18A22 Special properties of functors (faithful, full, etc.)
18A23 Natural morphisms, dinatural morphisms
18A25 Functor categories, comma categories
18A30 Limits and colimits (products, sums, directed limits, pushouts, fiber products, equalizers, kernels, ends and coends, etc.)
18A32 Factorization of morphisms (via images, coimages, dominions, codominions), substructures, quotient structures, congruences, amalgams
18A35 Categories admitting limits (complete categories), functors commuting with limits, continuous functors, completions
18A40 Adjoint functors (representable functors, universal constructions, reflective subcategories, reflections, etc.), constructions of adjoints (Kan extensions, etc.)
18A99 None of the above, but in this section
18Bxx Special categories
18B05 Category of sets, characterizations [See also 03–XX]
18B10 Category of relations, additive relations
18B15 Embedding theorems, universal categories [See also 18E20]
18B20 Categories of machines, automata, operative categories [See also 03D05, 68Qxx]
18B25 Topoi [See also 03G30]
18B30 Categories of topological spaces and continuous mappings [See also 54–XX]
18B35 Preorders, orders and lattices (viewed as categories) [See also 06–XX]
18B40 Groupoids, semigroupoids, semigroups, groups (viewed as categories) [See also 20Axx, 20Lxx, 20Mxx]
18B99 None of the above, but in this section
18Cxx Categories and algebraic theories
18C05 Equational categories [See also 03C05, 08C05]
18C10 Theories (e.g. algebraic theories), structure, and semantics [See also 03G30]
18C15 Triples (= standard construction, monad or triad), algebras for a triple, homology and derived functors for triples [See also 18Gxx]
18C20 Algebras and Kleisli categories associated with monads
18C99 None of the above, but in this section
18Dxx Categories with structure
18D05 Double categories, 2-categories, bicategories, hypercategories
18D10 Monoidal categories (= multiplicative categories) [See also 19D23]
18D15 Closed categories (closed monoidal and Cartesian closed categories, etc.)
18D20 Enriched categories (over closed or monoidal categories)
18D25 Strong functors, strong adjunctions
18D30 Fibered categories

18D35 Structured objects in a category (group objects, etc.)
18D99 None of the above, but in this section
18Exx Abelian categories
18E05 Preadditive, additive categories
18E10 Exact categories, abelian categories
18E15 Grothendieck categories
18E20 Embedding theorems [See also 18B15]
18E25 Derived functors and satellites
18E30 Derived categories, triangulated categories
18E35 Localization of categories
18E40 Torsion theories, radicals [See also 13D30, 16S90]
18E99 None of the above, but in this section
18Fxx Categories and geometry
18F05 Local categories and functors
18F10 Grothendieck topologies [See also 14F20]
18F15 Abstract manifolds and fiber bundles [See also 55Rxx, 57Pxx]
18F20 Presheaves and sheaves [See also 14F05, 32C35, 32L10, 54B40, 55N30]
18F25 Algebraic K-theory and L-theory [See also 11Exx, 11R70, 11S70, 12–XX, 13D15, 14Cxx, 16E20, 19–XX, 46L80, 57R65, 57R67]
18F30 Grothendieck groups [See also 13D15, 16E20, 19Axx]
18F99 None of the above, but in this section
18Gxx Homological algebra [See also 13Dxx, 16Exx, 55Uxx]
18G05 Projectives and injectives [See also 13C10, 13C11, 16D40, 16D50]
18G10 Resolutions; derived functors [See also 18E25]
18G15 Ext and Tor, generalizations, Künneth formula [See also 55U25]
18G20 Homological dimension [See also 13D05, 16E10]
18G25 Relative homological algebra, projective classes
18G30 Simplicial sets, simplicial objects (in a category) [See also 55U10]
18G35 Chain complexes [See also 18E30, 55U15]
18G40 Spectral sequences, hypercohomology [See also 55Txx]
18G50 Nonabelian homological algebra
18G55 Nonabelian homotopical algebra
18G60 Other (co)homology theories (cyclic, dihedral, etc.) [See also 19D55, 46L80, 58B30, 58G12]
18G99 None of the above, but in this section

19–XX K-THEORY [See also 16E20, 18F25]
19–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
19–01 Instructional exposition (textbooks, tutorial papers, etc.)
19–02 Research exposition (monographs, survey articles)
19–03 Historical (must also be assigned at least one classification number from Section 01)
19–04 Explicit machine computation and programs (not the theory of computation or programming)
19–06 Proceedings, conferences, collections, etc.
19Axx Grothendieck groups and K_0 [See also 13D15, 18F30]
19A13 Stability for projective modules [See also 13C10]
19A15 Efficient generation
19A22 Frobenius induction, Burnside and representation rings
19A31 K_0 of group rings and orders
19A49 K_0 of other rings
19A99 None of the above, but in this section
19Bxx Whitehead groups and K_1
19B10 Stable range conditions
19B14 Stability for linear groups
19B28 K_1 of group rings and orders [See also 57Q10]
19B37 Congruence subgroup problems [See also 20H05]
19B99 None of the above, but in this section
19Cxx Steinberg groups and K_2
19C09 Central extensions and Schur multipliers
19C20 Symbols, presentations and stability of K_2
19C30 K_2 and the Brauer group
19C40 Excision for K_2
19C99 None of the above, but in this section
19Dxx Higher algebraic K-theory
19D06 Q- and plus-constructions
19D10 Algebraic K-theory of spaces
19D23 Symmetric monoidal categories [See also 18D10]
19D25 Karoubi-Villamayor-Gersten K-theory
19D35 Negative K-theory, NK and Nil
19D45 Higher symbols, Milnor K-theory
19D50 Computations of higher K-theory of rings [See also 13D15, 16E20]
19D55 K-theory and homology; cyclic homology and cohomology [See also 18G60]
19D99 None of the above, but in this section
19Exx K-theory in geometry
19E08 K-theory of schemes [See also 14C35]
19E15 Algebraic cycles [See also 14C25, 14C35]
19E20 Relations with cohomology theories [See also 14Fxx]
19E99 None of the above, but in this section
19Fxx K-theory in number theory [See also 11R70, 11S70]
19F05 Generalized class field theory [See also 11G45]
19F15 Symbols and arithmetic [See also 11R37]
19F27 Étale cohomology, higher regulators, zeta and L-functions [See also 11G40, 11R42, 11S40, 14F20, 14G10]
19F99 None of the above, but in this section
19Gxx K-theory of forms [See also 11Exx]
19G05 Stability for quadratic modules
19G12 Witt groups of rings [See also 11E81]
19G24 L-theory of group rings [See also 11E81]
19G38 Hermitian K-theory, relations with K-theory of rings
19G99 None of the above, but in this section
19Jxx Obstructions from topology
19J05 Finiteness and other obstructions in K_0
19J10 Whitehead (and related) torsion
19J25 Surgery obstructions [See also 57R67]
19J35 Obstructions to group actions
19J99 None of the above, but in this section
19Kxx K-theory and operator algebras [See mainly 46L80, and also 46M20]
19K14 K_0 as an ordered group, traces
19K33 EXT and K-homology [See also 55N22]
19K35 Kasparov theory (KK-theory) [See also 58G12]
19K56 Index theory [See also 58G12]
19K99 None of the above, but in this section
19Lxx Topological K-theory [See also 55N15, 55R50, 55S25]
19L10 Riemann-Roch theorems, Chern characters
19L20 J-homomorphism, Adams operations [See also 55Q50]
19L41 Connective K-theory, cobordism [See also 55N22]
19L47 Equivariant K-theory [See also 55N91, 55P91, 55Q91, 55R91, 55S91]
19L64 Computations, geometric applications
19L99 None of the above, but in this section
19M05 Miscellaneous applications of K-theory

20–XX GROUP THEORY AND GENERALIZATIONS
20–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
20–01 Instructional exposition (textbooks, tutorial papers, etc.)
20–02 Research exposition (monographs, survey articles)
20–03 Historical (must also be assigned at least one classification number from Section 01)
20–04 Explicit machine computation and programs (not the theory of computation or programming)
20–06 Proceedings, conferences, collections, etc.
20Axx Foundations
20A05 Axiomatics and elementary properties
20A10 Metamathematical considerations {For word problems, see 20F10}
20A15 Applications of logic to group theory
20A99 None of the above, but in this section
20Bxx Permutation groups
20B05 General theory for finite groups
20B07 General theory for infinite groups
20B10 Characterization theorems
20B15 Primitive groups
20B20 Multiply transitive finite groups
20B22 Multiply transitive infinite groups
20B25 Finite automorphism groups of algebraic, geometric, or combinatorial structures [See also 05Bxx, 12F10, 20G40, 20H30, 51–XX]
20B27 Infinite automorphism groups [See also 12F10]
20B30 Symmetric groups
20B35 Subgroups of symmetric groups
20B40 Computational methods
20B99 None of the above, but in this section
20Cxx Representation theory of groups [See also 19A22 (for representation rings and Burnside rings)]
20C05 Group rings of finite groups and their modules [See also 16S34]
20C07 Group rings of infinite groups and their modules [See also 16S34]
20C10 Integral representations of finite groups
20C11 p-adic representations of finite groups
20C12 Integral representations of infinite groups
20C15 Ordinary representations and characters
20C20 Modular representations and characters
20C25 Projective representations and multipliers
20C30 Representations of finite symmetric groups
20C32 Representations of infinite symmetric groups
20C33 Representations of finite groups of Lie type
20C34 Representations of sporadic groups
20C35 Applications of group representations to physics
20C40 Computational methods
20C99 None of the above, but in this section
20Dxx Abstract finite groups
20D05 Classification of simple and nonsolvable groups
20D06 Simple groups: alternating groups and groups of Lie type [See also 20Gxx, 22Exx]

20D08 Simple groups; sporadic groups
20D10 Solvable groups, theory of formations, Schunck classes, Fitting classes, π-length, ranks [See also 20F17]
20D15 Nilpotent groups, p-groups
20D20 Sylow subgroups, Sylow properties, π-groups, π-structure
20D25 Special subgroups (Frattini, Fitting, etc.)
20D30 Series and lattices of subgroups
20D35 Subnormal subgroups
20D40 Products of subgroups
20D45 Automorphisms
20D50 Covering of subgroups
20D60 Arithmetic and combinatorial problems
20D99 None of the above, but in this section
20Exx Structure and classification of infinite or finite groups
20E05 Free nonabelian groups
20E06 Free products, free products with amalgamation, Higman-Neumann-Neumann extensions, and generalizations
20E07 Subgroup theorems
20E08 Groups acting on trees
20E10 Quasivarieties and varieties of groups
20E15 Chains and lattices of subgroups, subnormal subgroups [See also 20F22]
20E18 Limits, profinite groups
20E22 Extensions, wreath products, and other compositions [See also 20J05]
20E25 Local properties
20E26 Residual properties and generalizations
20E28 Maximal subgroups
20E32 Simple groups [See also 20D05]
20E34 General structure theorems
20E36 General theorems concerning automorphisms of groups
20E42 Groups with a BN-pair; buildings [See also 51E24]
20E99 None of the above, but in this section
20Fxx Special aspects of infinite or finite groups
20F05 Generators, relations, and presentations
20F06 Cancellation theory; application of van Kampen diagrams [See also 57M05]
20F10 Word problems, other decision problems, connections with logic and automata [See also 03B25, 03D05, 03D40, 06B25, 08A50, 68Qxx]
20F12 Commutator calculus
20F14 Derived series, central series, and generalizations
20F16 Solvable groups, supersolvable groups
20F17 Formations of groups, Fitting classes [See also 20D10]
20F18 Nilpotent groups
20F19 Generalizations of solvable and nilpotent groups
20F22 Other classes of groups defined by subgroup chains
20F24 FC-groups and their generalizations
20F28 Automorphism groups of groups [See also 20E36]
20F29 Representations of groups as automorphism groups of algebraic systems
20F32 Geometric group theory [See also 05C25, 20Exx, 20Gxx]
20F34 Fundamental groups and their automorphisms [See also 57M05, 57Sxx, 22E40]
20F36 Braid groups; Artin groups
20F38 Other groups related to topology or analysis
20F40 Associated Lie structures
20F45 Engel conditions
20F50 Periodic groups; locally finite groups
20F55 Coxeter groups [See also 22E40]
20F60 Ordered groups [See mainly 06F15]
20F99 None of the above, but in this section
20Gxx Linear algebraic groups (classical groups) {For arithmetic theory, see 11E57, 11H06; for geometric theory, see 14Lxx, 22Exx; for other methods in representation theory, see 15A30, 22E45, 22E46, 22E47, 22E50, 22E55}
20G05 Representation theory
20G10 Cohomology theory
20G15 Linear algebraic groups over arbitrary fields
20G20 Linear algebraic groups over the reals, the complexes, the quaternions
20G25 Linear algebraic groups over local fields and their integers
20G30 Linear algebraic groups over global fields and their integers
20G35 Linear algebraic groups over adèles and other rings and schemes
20G40 Linear algebraic groups over finite fields
20G45 Applications to physics; explicit representations
20G99 None of the above, but in this section
20Hxx Other groups of matrices [See also 15A30]
20H05 Unimodular groups, congruence subgroups [See also 11F06, 19B37, 22E40, 51F20]
20H10 Fuchsian groups and their generalizations [See also 11F06, 22E40, 30F35, 32Nxx]
20H15 Other geometric groups, including crystallographic groups [See also 51–XX, especially 51F15, and 82D25]
20H20 Other matrix groups over fields
20H25 Other matrix groups over rings
20H30 Other matrix groups over finite fields
20H99 None of the above, but in this section
20Jxx Connections with homological algebra and category theory
20J05 Homological methods in group theory
20J06 Cohomology of finite groups
20J10 Groups arising as cohomology groups
20J15 Category of groups
20J99 None of the above, but in this section
20Kxx Abelian groups
20K01 Finite abelian groups
20K05 Finitely generated groups
20K10 Torsion groups, primary groups and generalized primary groups
20K12 Ulm sequences
20K15 Torsion free groups, finite rank
20K20 Torsion free groups, infinite rank
20K21 Mixed groups
20K25 Direct sums, direct products, etc.
20K26 Indecomposable groups
20K27 Subgroups
20K30 Automorphisms, homomorphisms, endomorphisms, etc.
20K35 Extensions
20K40 Homological and categorical methods
20K45 Topological methods [See also 22A05, 22B05]
20K99 None of the above, but in this section
20Lxx Groupoids (i.e. small categories in which all morphisms are isomorphisms) {For sets with a single binary operation, see 20N02; for topological groupoids, see 22A22, 58H05}
20L05 General theory
20L10 Connections with group theory
20L13 Mappings of groupoids
20L15 Connections with topology
20L17 Connections with category theory
20L99 None of the above, but in this section
20Mxx Semigroups
20M05 Free semigroups, generators and relations, word problems
20M07 Varieties of semigroups
20M10 General structure theory
20M11 Radical theory
20M12 Ideal theory
20M14 Commutative semigroups
20M15 Mappings of semigroups
20M17 Regular semigroups
20M18 Inverse semigroups
20M19 Orthodox semigroups
20M20 Semigroups of transformations, etc. [See also 47D03, 47H20, 54H15]
20M25 Semigroup rings, multiplicative semigroups of rings [See also 16S36, 16Y60]
20M30 Representation of semigroups
20M35 Semigroups in automata theory, linguistics, etc. [See also 03D05, 68Qxx, 68S05]
20M50 Connections of semigroups with homological algebra and category theory
20M99 None of the above, but in this section
20Nxx Other generalizations of groups
20N02 Sets with a single binary operation (groupoids)
20N05 Loops, quasigroups [See also 05Bxx]
20N07 Mappings of loops
20N10 Ternary systems (heaps, semiheaps, heapoids, etc.)
20N15 n-ary systems
20N20 Hypergroups
20N25 Fuzzy groups [See also 04A72]
20N99 None of the above, but in this section
20P05 Probabilistic methods in group theory

22–XX TOPOLOGICAL GROUPS, LIE GROUPS {For transformation groups, see 54H15, 57Sxx, 58–XX. For abstract harmonic analysis, see 43–XX}
22–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
22–01 Instructional exposition (textbooks, tutorial papers, etc.)
22–02 Research exposition (monographs, survey articles)
22–03 Historical (must also be assigned at least one classification number from Section 01)
22–04 Explicit machine computation and programs (not the theory of computation or programming)
22–06 Proceedings, conferences, collections, etc.
22Axx Topological and differentiable algebraic systems {For topological rings and fields, see 12Jxx, 13Jxx, 16W80; for dual spaces of operator algebras and topological groups, see 47D35}
22A05 Structure of general topological groups
22A10 Analysis on general topological groups
22A15 Structure of topological semigroups

22A20 Analysis on topological semigroups
22A22 Topological groupoids (including differentiable and Lie groupoids)
22A25 Representations of general topological groups and semigroups
22A26 Topological semilattices, lattices and applications [See also 06B30, 06B35, 06F30]
22A30 Other topological algebraic systems and their representations
22A99 None of the above, but in this section
22Bxx Locally compact abelian groups (LCA groups)
22B05 General properties and structure of LCA groups
22B10 Structure of group algebras of LCA groups
22B99 None of the above, but in this section
22C05 Compact groups
22Dxx Locally compact groups and their algebras
22D05 General properties and structure of locally compact groups
22D10 Unitary representations of locally compact groups
22D12 Other representations of locally compact groups
22D15 Group algebras of locally compact groups
22D20 Representations of group algebras
22D25 C^*-algebras and W^*-algebras arising from group representations [See also 46Lxx]
22D30 Induced representations
22D35 Duality theorems
22D40 Ergodic theory on groups [See also 28Dxx, 43A60]
22D45 Automorphism groups of locally compact groups
22D99 None of the above, but in this section
22Exx Lie groups {For the topology of Lie groups and homogeneous spaces, see 57Sxx, 57Txx; for analysis thereon, see 43A80, 43A85, 43A90}
22E05 Local Lie groups [See also 34–XX, 35–XX, 58H05]
22E10 General properties and structure of complex Lie groups [See also 32M05]
22E15 General properties and structure of real Lie groups
22E20 General properties and structure of other Lie groups
22E25 Nilpotent and solvable Lie groups
22E27 Representations of nilpotent and solvable Lie groups (special orbital integrals, non-type I representations, etc.)
22E30 Analysis on real and complex Lie groups [See also 33C80, 43–XX]
22E35 Analysis on p-adic Lie groups [See also 11R56]
22E40 Discrete subgroups of Lie groups [See also 20Hxx, 32Nxx]
22E41 Continuous cohomology [See also 57R32, 57Txx, 58H10]
22E43 Structure and representation of the Lorentz group
22E45 Representations of Lie and linear algebraic groups over real fields: analytic methods {For the purely algebraic theory, see 20G05}
22E46 Semisimple Lie groups and their representations
22E47 Representations of Lie and real algebraic groups: algebraic methods (Verma modules, etc.) [See also 17B35]
22E50 Representations of Lie and linear algebraic groups over local fields
22E55 Representations of Lie and linear algebraic groups over global fields and adèle rings [See also 20G05]
22E60 Lie algebras of Lie groups {For the algebraic theory of Lie algebras, see 17Bxx}
22E65 Infinite-dimensional Lie groups and their Lie algebras [See also 17B65, 58B25, 58H05]
22E67 Loop groups and related constructions, group-theoretic treatment [See also 58D05]
22E70 Applications of Lie groups to physics; explicit representations [See also 81R05, 81R10]
22E99 None of the above, but in this section

26–XX REAL FUNCTIONS [See also 54C30]
26–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
26–01 Instructional exposition (textbooks, tutorial papers, etc.)
26–02 Research exposition (monographs, survey articles)
26–03 Historical (must also be assigned at least one classification number from Section 01)
26–04 Explicit machine computation and programs (not the theory of computation or programming)
26–06 Proceedings, conferences, collections, etc.
26Axx Functions of one variable
26A03 Foundations: limits and generalizations, elementary topology of the line
26A06 One-variable calculus
26A09 Elementary functions
26A12 Rate of growth of functions, orders of infinity, slowly varying functions [See also 26A48]
26A15 Continuity and related questions (modulus of continuity, semicontinuity, discontinuities, etc.) {For properties determined by Fourier coefficients, see 42A16; for those determined by approximation properties, see 41A25, 41A27}
26A16 Lipschitz (Hölder) classes
26A18 Iteration [See also 39B12, 47H10, 54H25, 58F08, 58F13]
26A21 Classification of real functions; Baire classification of sets and functions [See also 04A15, 28A05, 54C50]
26A24 Differentiation (functions of one variable): general theory, generalized derivatives, mean-value theorems [See also 28A15]
26A27 Nondifferentiability (nondifferentiable functions, points of nondifferentiability), discontinuous derivatives
26A30 Singular functions, Cantor functions, functions with other special properties
26A33 Fractional derivatives and integrals
26A36 Antidifferentiation
26A39 Denjoy and Perron integrals, other special integrals
26A42 Integrals of Riemann, Stieltjes and Lebesgue type [See also 28–XX]
26A45 Functions of bounded variation, generalizations
26A46 Absolutely continuous functions
26A48 Monotonic functions, generalizations
26A51 Convexity, generalizations
26A99 None of the above, but in this section
26Bxx Functions of several variables
26B05 Continuity and differentiation questions
26B10 Implicit function theorems, Jacobians, transformations with several variables
26B12 Calculus of vector functions
26B15 Integration: length, area, volume [See also 28A75, 51M25]
26B20 Integral formulas (Stokes, Gauss, Green, etc.)
26B25 Convexity, generalizations
26B30 Absolutely continuous functions, functions of bounded variation
26B35 Special properties of functions of several variables, Hölder conditions, etc.
26B40 Representation and superposition of functions
26B99 None of the above, but in this section
26Cxx Polynomials, rational functions
26C05 Polynomials: analytic properties, etc. [See also 12Dxx, 12Exx]
26C10 Polynomials: location of zeros [See also 12D10, 30C15, 65H05]
26C15 Rational functions [See also 14Pxx]
26C99 None of the above, but in this section
26Dxx Inequalities {For maximal function inequalities, see 42B25; for functional inequalities, see 39B72; for probabilistic inequalities, see 60E15}
26D05 Inequalities for trigonometric functions and polynomials
26D07 Inequalities involving other types of functions
26D10 Inequalities involving derivatives and differential and integral operators
26D15 Inequalities for sums, series and integrals
26D20 Other analytical inequalities
26D99 None of the above, but in this section
26Exx Miscellaneous topics [See also 58Cxx]
26E05 Real-analytic functions [See also 32B05, 32C05]
26E10 C^∞-functions, quasi-analytic functions [See also 58C25]
26E15 Calculus of functions on infinite-dimensional spaces [See also 46G05, 58Cxx]
26E20 Calculus of functions taking values in infinite-dimensional spaces [See also 46E40, 46G10, 58Cxx]
26E25 Set-valued functions [See also 28B20, 54C60] {For nonsmooth analysis, see 49J52, 58Cxx, 90Cxx}
26E30 Non-Archimedean analysis [See also 12J25]
26E35 Nonstandard analysis [See also 03H05, 28E05, 54J05]
26E40 Constructive real analysis [See also 03F60, 03F65]
26E50 Fuzzy real analysis [See also 04A72, 28E10]
26E99 None of the above, but in this section

28–XX MEASURE AND INTEGRATION {For analysis on manifolds, see 58–XX}
28–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
28–01 Instructional exposition (textbooks, tutorial papers, etc.)
28–02 Research exposition (monographs, survey articles)
28–03 Historical (must also be assigned at least one classification number from Section 01)
28–04 Explicit machine computation and programs (not the theory of computation or programming)
28–06 Proceedings, conferences, collections, etc.
28Axx Classical measure theory
28A05 Classes of sets (Borel fields, σ-rings, etc.), measurable sets, Suslin sets, analytic sets [See also 03E15, 04A15, 26A21, 54H05]
28A10 Real- or complex-valued set functions
28A12 Contents, measures, outer measures, capacities
28A15 Abstract differentiation theory, differentiation of set functions [See also 26A24]
28A20 Measurable and nonmeasurable functions, sequences of measurable functions, modes of convergence
28A25 Integration with respect to measures and other set functions
28A33 Spaces of measures, convergence of measures [See also 46E27, 60Bxx]
28A35 Measures and integrals in product spaces
28A50 Integration and disintegration of measures
28A51 Lifting theory [See also 46G15]

28A60 Measures on Boolean rings, measure algebras [See also 54H10]
28A75 Length, area, volume, other geometric measure theory [See also 26B15, 49Q15]
28A78 Hausdorff measures
28A80 Fractals [See also 58Fxx]
28A99 None of the above, but in this section
28Bxx Set functions, measures and integrals with values in abstract spaces
28B05 Vector-valued set functions, measures and integrals [See also 46G10]
28B10 Group- or semigroup-valued set functions, measures and integrals
28B15 Set functions, measures and integrals with values in ordered spaces
28B20 Set-valued set functions and measures; integration of set-valued functions; measurable selections [See also 26E25, 54C60, 54C65, 90A14]
28B99 None of the above, but in this section
28Cxx Set functions and measures on spaces with additional structure [See also 46G12, 58C35, 58D20]
28C05 Integration theory via linear functionals (Radon measures, Daniell integrals, etc.), representing set functions and measures
28C10 Set functions and measures on topological groups, Haar measures, invariant measures [See also 22Axx, 43A05]
28C15 Set functions and measures on topological spaces (regularity of measures, etc.)
28C20 Set functions and measures and integrals in infinite-dimensional spaces (Wiener measure, Gaussian measure, etc.) [See also 46G12, 58C35, 58D20, 60B11]
28C99 None of the above, but in this section
28Dxx Measure-theoretic ergodic theory [See also 11K50, 11K55, 22D40, 47A35, 54H20, 58Fxx, 60Fxx, 60G10]
28D05 Measure-preserving transformations
28D10 One-parameter continuous families of measure-preserving transformations
28D15 General groups of measure-preserving transformations
28D20 Entropy and other invariants
28D99 None of the above, but in this section
28Exx Miscellaneous topics in measure theory
28E05 Nonstandard measure theory [See also 03H05, 26E35]
28E10 Fuzzy measure theory [See also 04A72, 26E50, 94D05]
28E15 Other connections with logic and set theory
28E99 None of the above, but in this section

30–XX FUNCTIONS OF A COMPLEX VARIABLE {For analysis on manifolds, see 58–XX}
30–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
30–01 Instructional exposition (textbooks, tutorial papers, etc.)
30–02 Research exposition (monographs, survey articles)
30–03 Historical (must also be assigned at least one classification number from Section 01)
30–04 Explicit machine computation and programs (not the theory of computation or programming)
30–06 Proceedings, conferences, collections, etc.
30Axx General properties
30A05 Monogenic properties of complex functions (including polygenic and areolar monogenic functions)
30A10 Inequalities in the complex domain
30A99 None of the above, but in this section
30Bxx Series expansions
30B10 Power series (including lacunary series)
30B20 Random power series
30B30 Boundary behavior of power series, over-convergence
30B40 Analytic continuation
30B50 Dirichlet series and other series expansions, exponential series [See also 11M41, 42–XX]
30B60 Completeness problems, closure of a system of functions
30B70 Continued fractions [See also 11A55, 40A15]
30B99 None of the above, but in this section
30Cxx Geometric function theory
30C10 Polynomials
30C15 Zeros of polynomials, rational functions, and other analytic functions (e.g. zeros of functions with bounded Dirichlet integral) {For algebraic theory, see 12D10; for real methods, see 26C10}
30C20 Conformal mappings of special domains
30C25 Covering theorems in conformal mapping theory
30C30 Numerical methods in conformal mapping theory [See also 65E05]
30C35 General theory of conformal mappings
30C40 Kernel functions and applications
30C45 Special classes of univalent and multivalent functions (starlike, convex, bounded rotation, etc.)
30C50 Coefficient problems for univalent and multivalent functions
30C55 General theory of univalent and multivalent functions
30C62 Quasiconformal mappings in the plane
30C65 Quasiconformal mappings in R^n, other generalizations
30C70 Extremal problems for conformal and quasiconformal mappings, variational methods
30C75 Extremal problems for conformal and quasiconformal mappings, other methods
30C80 Maximum principle; Schwarz's lemma, Lindelöf principle, analogues and generalizations; subordination
30C85 Capacity and harmonic measure in the complex plane [See also 31A15]
30C99 None of the above, but in this section
30Dxx Entire and meromorphic functions, and related topics
30D05 Functional equations in the complex domain, iteration and composition of analytic functions [See also 34A20, 39–XX, 58F08, 58F23]
30D10 Representations of entire functions by series and integrals
30D15 Special classes of entire functions and growth estimates
30D20 Entire functions, general theory
30D30 Meromorphic functions, general theory
30D35 Distribution of values, Nevanlinna theory
30D40 Cluster sets, prime ends, boundary behavior
30D45 Bloch functions, normal functions, normal families
30D50 Blaschke products, bounded mean oscillation, bounded characteristic, bounded functions, functions with positive real part
30D55 H^p-classes
30D60 Quasi-analytic and other classes of functions
30D99 None of the above, but in this section
30Exx Miscellaneous topics of analysis in the complex domain
30E05 Moment problems, interpolation problems
30E10 Approximation in the complex domain
30E15 Asymptotic representations in the complex domain
30E20 Integration, integrals of Cauchy type, integral representations of analytic functions [See also 45Exx]
30E25 Boundary value problems [See also 45Exx]
30E99 None of the above, but in this section
30Fxx Riemann surfaces
30F10 Compact Riemann surfaces and uniformization [See also 14H15, 32G15]
30F15 Harmonic functions on Riemann surfaces
30F20 Classification theory of Riemann surfaces
30F25 Ideal boundary theory
30F30 Differentials on Riemann surfaces
30F35 Fuchsian groups and automorphic functions [See also 11Fxx, 20H10, 22E40, 32Gxx, 32Nxx]
30F40 Kleinian groups [See also 20H10]
30F45 Conformal metrics (hyperbolic, Poincaré, distance functions)
30F50 Klein surfaces
30F60 Teichmüller theory [See also 32G15]
30F99 None of the above, but in this section
30Gxx Generalized function theory
30G06 Non-Archimedean function theory [See also 12J25]; nonstandard function theory [See also 03H05]
30G12 Finely holomorphic functions and topological function theory
30G20 Generalizations of Bers or Vekua type (pseudo-analytic, p-analytic, etc.)
30G25 Discrete analytic functions
30G30 Other generalizations of analytic functions (including abstract-valued functions)
30G35 Functions of hypercomplex variables and generalized variables
30G99 None of the above, but in this section
30H05 Spaces and algebras of analytic functions [See also 32E25, 46Exx, 46J15]

31–XX POTENTIAL THEORY {For probabilistic potential theory, see 60J45}
31–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
31–01 Instructional exposition (textbooks, tutorial papers, etc.)
31–02 Research exposition (monographs, survey articles)
31–03 Historical (must also be assigned at least one classification number from Section 01)
31–04 Explicit machine computation and programs (not the theory of computation or programming)
31–06 Proceedings, conferences, collections, etc.
31Axx Two-dimensional theory
31A05 Harmonic, subharmonic, superharmonic functions
31A10 Integral representations, integral operators, integral equations methods
31A15 Potentials and capacity, harmonic measure, extremal length [See also 30C85]
31A20 Boundary behavior (theorems of Fatou type, etc.)
31A25 Boundary value and inverse problems
31A30 Biharmonic, polyharmonic functions and equations, Poisson's equation
31A35 Connections with differential equations
31A99 None of the above, but in this section

31Bxx Higher-dimensional theory
31B05 Harmonic, subharmonic, superharmonic functions
31B10 Integral representations, integral operators, integral equations methods
31B15 Potentials and capacities, extremal length
31B20 Boundary value and inverse problems
31B25 Boundary behavior
31B30 Biharmonic and polyharmonic equations and functions
31B35 Connections with differential equations
31B99 None of the above, but in this section
31Cxx Other generalizations
31C05 Harmonic, subharmonic, superharmonic functions
31C10 Pluriharmonic and plurisubharmonic functions [See also 32F05]
31C12 Potential theory on Riemannian manifolds [See also 53C20; for Hodge theory, see 58A14]
31C15 Potentials and capacities
31C20 Discrete potential theory and numerical methods
31C25 Dirichlet spaces
31C35 Martin boundary theory [See also 60J50]
31C40 Fine potential theory
31C45 Other generalizations (nonlinear potential theory, etc.)
31C99 None of the above, but in this section
31D05 Axiomatic potential theory

32–XX SEVERAL COMPLEX VARIABLES AND ANALYTIC SPACES
{For infinite-dimensional holomorphy, see also 46G20, 58B12}
32–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
32–01 Instructional exposition (textbooks, tutorial papers, etc.)
32–02 Research exposition (monographs, survey articles)
32–03 Historical (must also be assigned at least one classification number from Section 01)
32–04 Explicit machine computation and programs (not the theory of computation or programming)
32–06 Proceedings, conferences, collections, etc.
32Axx Holomorphic functions of several complex variables
32A05 Power series, series of functions
32A07 Special domains (Reinhardt, Hartogs, tube domains, etc.)
32A10 Holomorphic functions
32A15 Entire functions
32A17 Special families of functions (e.g. normal families)
32A20 Meromorphic functions
32A22 Nevanlinna theory (local); growth estimates; other inequalities {For geometric theory, see 32H25, 32H30}
32A25 Integral representation
32A27 Local theory of residues [See also 32C30]
32A30 Other generalizations of function theory of one complex variable (should also be assigned at least one classification number from Section 30) {For functions of several hypercomplex variables, see 30G35}
32A35 H^p-spaces [See also 32M15, 42B30, 43A85, 46J15]
32A37 Other spaces of holomorphic functions (e.g. bounded mean oscillation (BMOA), vanishing mean oscillation (VMOA) in n dimensions) [See also 46Exx]
32A40 Boundary behavior
32A45 Hyperfunctions [See also 46F15]
32A99 None of the above, but in this section
32Bxx Local analytic geometry [See also 13–XX and 14–XX]
32B05 Analytic algebras and generalizations, preparation theorems
32B10 Germs of analytic sets
32B15 Analytic subsets of affine space
32B20 Semi-analytic sets and subanalytic sets [See also 14P15]
32B25 Triangulation and related questions
32B99 None of the above, but in this section
32Cxx General theory of analytic spaces
32C05 Real-analytic manifolds, real-analytic spaces [See also 14Pxx, 58A07]
32C07 Real-analytic sets, complex Nash functions [See also 14P15, 14P20]
32C10 Complex manifolds {For almost complex manifolds, see 53C15}
32C11 Complex supergeometry [See also 14A22, 14M30, 58A50]
32C15 Complex spaces
32C16 CR-manifolds
32C17 Kähler geometry {For differential-geometric methods, see 53C55}
32C18 Topology of analytic spaces
32C20 Normal analytic spaces
32C25 Analytic subsets and submanifolds
32C30 Integration on analytic sets and spaces, currents {For local theory, see 32A25 or 32A27}
32C35 Analytic sheaves and cohomology groups [See also 14Fxx, 18F20, 55N30]
32C36 Local cohomology of analytic spaces
32C37 Duality theorems
32C38 Sheaves of differential operators and their modules [See also 14F10, 16S32, 35A27, 58G07]
32C81 Applications to physics
32C99 None of the above, but in this section
32Dxx Analytic continuation
32D05 Domains of holomorphy
32D10 Envelopes of holomorphy
32D15 Continuation of analytic objects
32D20 Removable singularities
32D99 None of the above, but in this section
32Exx Holomorphic convexity
32E05 Holomorphically convex complex spaces, reduction theory
32E10 Stein spaces, Stein manifolds
32E20 Polynomial convexity
32E25 Algebras of holomorphic functions [See also 30H05, 46J10, 46J15]
32E30 Holomorphic and polynomial approximation, Runge pairs, interpolation
32E35 Global boundary behavior of holomorphic functions
32E99 None of the above, but in this section
32Fxx Geometric convexity, partial differential operators
32F05 Plurisubharmonic functions and generalizations [See also 31C10]
32F07 Complex Monge-Ampère operator
32F10 q-convexity, q-concavity
32F15 Pseudoconvex domains
32F20 $\overline{\partial}$- and $\overline{\partial}_b$-Neumann problems [See also 35N15]
32F25 Real submanifolds in complex manifolds
32F30 Pseudoconvex manifolds
32F40 CR structures, (tangential) CR operators and generalizations
32F99 None of the above, but in this section
32Gxx Deformations of analytic structures
32G05 Deformations of complex structures [See also 13D10, 16S80, 58H10, 58H15]
32G07 Deformations of special (e.g. CR) structures
32G08 Deformations of fiber bundles
32G10 Deformations of submanifolds and subspaces
32G13 Analytic moduli problems {For algebraic moduli problems, see 14D20, 14D22, 14H10, 14J10} [See also 14H15, 14J15]
32G15 Moduli of Riemann surfaces, Teichmüller theory [See also 14H15, 30Fxx]
32G20 Period matrices, variation of Hodge structure; degenerations [See also 14D05, 14D07, 14K30]
32G34 Moduli and deformations for ordinary differential equations [See also 34A20]
32G81 Applications to physics
32G99 None of the above, but in this section
32Hxx Holomorphic mappings and correspondences
32H02 Holomorphic mappings, (holomorphic) embeddings and related questions
32H04 Meromorphic mappings
32H10 Bergman kernel function, representative domains
32H15 Invariant metrics and pseudodistances
32H20 Hyperbolic complex manifolds
32H25 Picard-type theorems and generalizations {For function-theoretic properties, see 32A22}
32H30 Value distribution theory in higher dimensions {For function-theoretic properties, see 32A22}
32H35 Proper mappings, finiteness theorems
32H40 Boundary regularity of holomorphic maps
32H50 Iteration problems
32H99 None of the above, but in this section
32Jxx Compact analytic spaces {For Riemann surfaces, see 14Hxx, 30Fxx; for algebraic theory, see 14Jxx}
32J05 Compactification of analytic spaces
32J10 Algebraic dependence theorems
32J15 Compact surfaces
32J17 Compact 3-folds
32J18 Compact n-folds ($n \geq 4$)
32J20 Algebraicity criteria
32J25 Transcendental methods of algebraic geometry [See also 14C30]
32J27 Compact Kähler manifolds: generalizations, classification
32J81 Applications to physics
32J99 None of the above, but in this section
32Kxx Generalizations of analytic spaces (should also be assigned at least one other classification number in this section)
32K05 Banach analytic spaces [See also 58Bxx]
32K07 Formal and graded complex spaces [See also 58C50]
32K15 Differentiable functions on analytic spaces, differentiable spaces [See also 58C25]
32K99 None of the above, but in this section
32Lxx Holomorphic fiber spaces [See also 55Rxx]
32L05 Holomorphic fiber bundles and generalizations
32L07 Hermite-Einstein bundles; Kähler-Einstein metrics [See also 53C07]
32L10 Sheaves and cohomology of sections of holomorphic vector bundles, general results [See also 14F05, 18F20, 55N30]
32L15 Bundle convexity [See also 32F10]
32L20 Vanishing theorems

32L25 Twistor theory, double fibrations
32L30 Holomorphic foliations [See also 58F18]
32L81 Applications to physics
32L99 None of the above, but in this section
32Mxx Complex spaces with a group of automorphisms
32M05 Complex Lie groups, automorphism groups of complex spaces [See also 22E10]
32M10 Homogeneous complex manifolds [See also 14M17, 57T15]
32M12 Almost homogeneous manifolds and spaces [See also 14M17]
32M15 Hermitian symmetric spaces, bounded symmetric domains [See also 22E10, 22E40, 53C35, 57T15]
32M99 None of the above, but in this section
32Nxx Automorphic functions [See also 11Fxx, 20H10, 22E40, 30F35]
32N05 General theory of automorphic functions of several complex variables
32N10 Automorphic forms
32N15 Automorphic functions in symmetric domains
32N99 None of the above, but in this section
32P05 Non-Archimedean complex analysis (should also be assigned at least one other classification number from Section 32 describing the type of problem)
32Sxx Singularities
32S05 Local singularities [See also 14B05]
32S10 Invariants of analytic local rings
32S15 Equisingularity (topological and analytic) [See also 14E15]
32S20 Global theory of singularities; cohomological properties [See also 14E15]
32S25 (Hyper-) surface singularities [See also 14J17]
32S30 Deformations of singularities; vanishing cycles [See also 14B07]
32S35 Mixed Hodge theory of singular varieties [See also 14C30, 14D07]
32S40 Monodromy; relations with differential equations and D-modules
32S45 Modifications; resolution of singularities [See also 14E15]
32S50 Topological aspects: Lefschetz theorems, topological classification, invariants
32S55 Milnor fibration; relations with knot theory [See also 57M25, 57Q45]
32S60 Stratifications; constructible sheaves; intersection cohomology [See also 58C27]
32S65 Singularities of holomorphic vector fields
32S70 Other operations on singularities

33–XX SPECIAL FUNCTIONS {33–XX deals with the properties of functions as functions. For orthogonal functions, see also 42Cxx; for aspects of combinatorics, see 05Axx; for number-theoretic aspects, see 11–XX; for representation theory, see 22Exx}
33–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
33–01 Instructional exposition (textbooks, tutorial papers, etc.)
33–02 Research exposition (monographs, survey articles)
33–03 Historical (must also be assigned at least one classification number from Section 01)
33–04 Explicit machine computation and programs (not the theory of computation or programming)
33–06 Proceedings, conferences, collections, etc.
33Bxx Elementary classical functions
33B10 Exponential and trigonometric functions
33B15 Gamma, beta and polygamma functions
33B20 Incomplete beta and gamma functions (error functions, probability integrals, Fresnel integrals)
33B99 None of the above, but in this section
33Cxx Hypergeometric functions
33C05 Classical hypergeometric functions, ${}_2F_1$
33C10 Bessel and Airy functions, cylinder functions, ${}_0F_1$
33C15 Confluent hypergeometric functions, Whittaker functions, ${}_1F_1$
33C20 Generalized hypergeometric series, ${}_pF_q$
33C45 Orthogonal polynomials and functions (Chebyshev, Legendre, Gegenbauer, Jacobi, Laguerre, Hermite, Hahn, etc.)
33C50 Orthogonal polynomials and functions in several variables
33C55 Spherical functions, spherical harmonics, ultraspherical polynomials
33C60 Hypergeometric integrals and functions defined by them (E, G and H functions)
33C65 Appell, Horn and Lauricella functions
33C70 Other hypergeometric functions and integrals in several variables
33C75 Elliptic integrals as hypergeometric functions
33C80 Connections with groups, algebras, root systems and related topics
33C90 Applications
33C99 None of the above, but in this section
33Dxx Basic hypergeometric functions
33D05 q-gamma functions, q-beta functions and integrals
33D10 Basic theta functions
33D15 Basic hypergeometric functions in one variable
33D20 Generalized basic hypergeometric series
33D45 Basic orthogonal polynomials and functions in one and several variables
33D55 Basic spherical functions, spherical harmonics (continuous and discrete)
33D60 Basic hypergeometric integrals and functions defined by them
33D65 Bibasic functions and multiple bases
33D70 Other basic hypergeometric functions and integrals in several variables
33D80 Connections with groups, algebras, and related topics
33D90 Applications
33D99 None of the above, but in this section
33Exx Other special functions
33E05 Elliptic functions and integrals
33E10 Lamé, Mathieu, and spheroidal wave functions
33E15 Other wave functions
33E20 Other functions defined by series and integrals
33E30 Other functions coming from differential, difference and integral equations
33E99 None of the above, but in this section

34–XX ORDINARY DIFFERENTIAL EQUATIONS
34–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
34–01 Instructional exposition (textbooks, tutorial papers, etc.)
34–02 Research exposition (monographs, survey articles)
34–03 Historical (must also be assigned at least one classification number from Section 01)
34–04 Explicit machine computation and programs (not the theory of computation or programming)
34–06 Proceedings, conferences, collections, etc.
34Axx General theory
34A05 Explicit solutions and reductions
34A09 Implicit equations
34A12 Initial value problems, existence, uniqueness, continuous dependence and continuation of solutions
34A20 Differential equations in the complex domain [See also 30D05, 32G34]
34A25 Analytical theory: series, transformations, transforms, operational calculus, etc. [See also 44–XX, 47E05]
34A26 Geometric methods in differential equations
34A30 Linear equations and systems
34A34 Nonlinear equations and systems, general
34A35 Differential equations of infinite order
34A37 Differential equations with impulses
34A40 Differential inequalities
34A45 Theoretical approximation of solutions
34A46 Theoretical solution methods other than approximations
34A47 Bifurcation
34A50 Numerical approximation of solutions {For numerical analysis, see 65Lxx}
34A55 Inverse problems
34A60 Equations with multivalued right-hand sides [See also 49J24, 49K24]
34A65 Stiff equations
34A99 None of the above, but in this section
34Bxx Boundary value problems {For ordinary differential operators, see 34Lxx}
34B05 Linear equations
34B10 Multipoint boundary value problems
34B15 Nonlinear boundary value problems
34B20 Weyl theory and its generalizations
34B24 Sturm-Liouville theory [See also 34Lxx]
34B27 Green functions
34B30 Special equations (Mathieu, Hill, Bessel, etc.)
34B99 None of the above, but in this section
34Cxx Qualitative theory [See also 58Fxx]
34C05 Location of integral curves, singular points, limit cycles
34C10 Oscillation theory, zeros, disconjugacy and comparison theory
34C11 Growth, boundedness, comparison of solutions
34C15 Nonlinear oscillations
34C20 Transformation and reduction of equations and systems, normal forms
34C23 Bifurcation [See mainly 58F14]
34C25 Periodic solutions
34C27 Almost-periodic solutions
34C28 Other types of "recurrent" solutions
34C29 Averaging method
34C30 Manifolds of solutions
34C35 Dynamical systems [See also 54H20, 58Fxx, 70–XX]
34C37 Homoclinic and heteroclinic solutions [See also 58F15]
34C40 Equations and systems on manifolds [See mainly 58Fxx, 58Gxx]
34C45 Method of integral manifolds
34C50 Method of accelerated convergence
34C99 None of the above, but in this section
34Dxx Stability theory [See also 58F10, 93Dxx]
34D05 Asymptotic properties
34D08 Lyapunov exponents
34D10 Perturbations
34D15 Singular perturbations

34D20 Lyapunov stability
34D25 Popov-type stability
34D30 Structural stability and analogous concepts [See also 58F10, 58F12]
34D35 Stability of manifolds of solutions
34D40 Ultimate boundedness
34D45 Attractors
34D99 None of the above, but in this section
34Exx Asymptotic theory
34E05 Asymptotic expansions
34E10 Perturbations, asymptotics
34E15 Singular perturbations, general theory
34E20 Singular perturbations, turning point theory, WKB methods
34E99 None of the above, but in this section
34F05 Equations and systems with randomness [See also 34K50, 60H10, 93E03]
34Gxx Differential equations in abstract spaces [See also 58D25]
34G10 Linear equations [See also 47Axx, 47Bxx, 47D06, 47D09]
34G20 Nonlinear equations [See also 47Hxx]
34G99 None of the above, but in this section
34H05 Control problems [See also 49J25, 49K25, 93C15]
34Kxx Functional-differential and differential-difference equations, with or without deviating arguments
34K05 General theory
34K10 Boundary value problems
34K15 Qualitative theory
34K20 Stability theory
34K25 Asymptotic theory
34K30 Equations in abstract spaces [See also 34Gxx]
34K35 Control problems [See also 49J25, 49K25, 93C15]
34K40 Neutral equations
34K50 Stochastic delay equations [See also 34F05, 60Hxx]
34K99 None of the above, but in this section
34Lxx Ordinary differential operators [See also 47E05]
34L05 General spectral theory
34L10 Eigenfunction expansions, completeness of eigenfunctions
34L15 Estimation of eigenvalues, upper and lower bounds
34L20 Asymptotic distribution of eigenvalues, asymptotic theory of eigenfunctions
34L25 Scattering theory
34L30 Nonlinear ordinary differential operators
34L40 Particular operators (Dirac, one-dimensional Schrödinger, etc.)
34L99 None of the above, but in this section

35–XX PARTIAL DIFFERENTIAL EQUATIONS
35–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
35–01 Instructional exposition (textbooks, tutorial papers, etc.)
35–02 Research exposition (monographs, survey articles)
35–03 Historical (must also be assigned at least one classification number from Section 01)
35–04 Explicit machine computation and programs (not the theory of computation or programming)
35–06 Proceedings, conferences, collections, etc.
35Axx General theory
35A05 General existence and uniqueness theorems
35A07 Local existence and uniqueness theorems [See also 35H05, 35Sxx]
35A08 Fundamental solutions
35A10 Cauchy-Kovalevskaya theorems
35A15 Variational methods
35A20 Analytic methods, singularities
35A22 Transform methods (e.g. integral transforms)
35A25 Other special methods
35A27 Microlocal methods; methods of sheaf theory and homological algebra in PDE [See also 32C38, 58G07]
35A30 Geometric theory, characteristics, transformations [See also 58G35, 58G37]
35A35 Theoretical approximation to solutions
35A40 Numerical approximation to solutions {For numerical analysis, see 65Mxx, 65Nxx, 65P05}
35A99 None of the above, but in this section
35Bxx Qualitative properties of solutions
35B05 General behavior of solutions of PDE (comparison theorems; oscillation, zeros and growth of solutions; mean value theorems)
35B10 Periodic solutions
35B15 Almost periodic solutions
35B20 Perturbations
35B25 Singular perturbations
35B27 Homogenization; partial differential equations in media with periodic structure [See also 73B27, 76D30]
35B30 Dependence of solutions of PDE on initial and boundary data, parameters [See also 58F14]
35B32 Bifurcation [See also 58F14]
35B35 Stability, boundedness
35B37 PDE in connection with control problems [See also 49J20, 49K20, 93C20]
35B40 Asymptotic behavior of solutions
35B45 A priori estimates
35B50 Maximum principles
35B60 Continuation and prolongation of solutions of PDE [See also 58A15, 58A17, 58Hxx]
35B65 Smoothness/regularity of solutions of PDE
35B99 None of the above, but in this section
35Cxx Representations of solutions
35C05 Solutions in closed form
35C10 Series solutions, expansion theorems
35C15 Integral representations of solutions of PDE
35C20 Asymptotic expansions
35C99 None of the above, but in this section
35Dxx Generalized solutions of partial differential equations
35D05 Existence of generalized solutions
35D10 Regularity of generalized solutions
35D99 None of the above, but in this section
35Exx Equations and systems with constant coefficients [See also 35N05]
35E05 Fundamental solutions
35E10 Convexity properties
35E15 Initial value problems
35E20 General theory
35E99 None of the above, but in this section
35Fxx General first-order equations and systems
35F05 General theory of linear first-order PDE
35F10 Initial value problems for linear first-order PDE, linear evolution equations
35F15 Boundary value problems for linear first-order PDE
35F20 General theory of nonlinear first-order PDE
35F25 Initial value problems for nonlinear first-order PDE, nonlinear evolution equations
35F30 Boundary value problems for nonlinear first-order PDE
35F99 None of the above, but in this section
35Gxx General higher-order equations and systems
35G05 General theory of linear higher-order PDE
35G10 Initial value problems for linear higher-order PDE, linear evolution equations
35G15 Boundary value problems for linear higher-order PDE
35G20 General theory of nonlinear higher-order PDE
35G25 Initial value problems for nonlinear higher-order PDE, nonlinear evolution equations
35G30 Boundary value problems for nonlinear higher-order PDE
35G99 None of the above, but in this section
35Hxx Hypoelliptic equations and systems [See also 58Gxx]
35Jxx Partial differential equations of elliptic type [See also 58G05, 58G10]
35J05 Laplace equation, reduced wave equation (Helmholtz), Poisson equation [See also 31Axx, 31Bxx]
35J10 Schrödinger operator [See also 35Pxx]
35J15 General theory of second-order elliptic equations
35J20 Variational methods for second-order elliptic equations
35J25 Boundary value problems for second-order elliptic equations
35J30 General theory of higher-order elliptic equations [See also 31A30, 31B30]
35J35 Variational methods for higher-order elliptic equations
35J40 Boundary value problems for higher-order elliptic equations
35J45 General theory of elliptic systems of PDE
35J50 Variational methods for elliptic systems
35J55 Boundary value problems for elliptic systems
35J60 Nonlinear PDE of elliptic type
35J65 Nonlinear boundary value problems for linear elliptic PDE; boundary value problems for nonlinear elliptic PDE
35J67 Boundary values of solutions to elliptic PDE
35J70 Elliptic partial differential equations of degenerate type
35J85 Unilateral problems and variational inequalities for elliptic PDE [See also 35R35, 49J40]
35J99 None of the above, but in this section
35Kxx Parabolic equations and systems [See also 35Bxx, 35Dxx, 35R30, 35R35, 58G11]
35K05 Heat equation
35K10 General theory of second-order parabolic equations
35K15 Initial value problems for second-order parabolic equations
35K20 Boundary value problems for second-order parabolic equations
35K22 Evolution equations (any order in the spatial derivatives) [See also 58D25]
35K25 General theory of higher-order parabolic equations
35K30 Initial value problems for higher-order parabolic equations
35K35 Boundary value problems for higher-order parabolic equations
35K40 General theory of parabolic systems of PDE
35K45 Initial value problems for parabolic systems
35K50 Boundary value problems for parabolic systems

35K55 Nonlinear PDE of parabolic type
35K57 Reaction-diffusion equations
35K60 Nonlinear boundary value problems for linear parabolic PDE; boundary value problems for nonlinear parabolic PDE
35K65 Parabolic partial differential equations of degenerate type
35K70 Ultraparabolic, pseudoparabolic PDE, etc.
35K85 Unilateral problems and variational inequalities for parabolic PDE [See also 35R35, 49J40]
35K99 None of the above, but in this section
35Lxx Partial differential equations of hyperbolic type [See also 58G16]
35L05 Wave equation
35L10 General theory of second-order hyperbolic equations
35L15 Initial value problems for second-order hyperbolic equations
35L20 Boundary value problems for second-order hyperbolic equations
35L25 General theory of higher-order hyperbolic equations
35L30 Initial value problems for higher-order hyperbolic equations
35L35 Boundary value problems for higher-order hyperbolic equations
35L40 General theory of hyperbolic systems of first-order PDE
35L45 Initial value problems for hyperbolic systems of first-order PDE
35L50 Boundary value problems for hyperbolic systems of first-order PDE
35L55 Hyperbolic systems of higher-order PDE
35L60 Nonlinear first-order PDE of hyperbolic type
35L65 Conservation laws
35L67 Shocks and singularities [See also 58C27, 76L05]
35L70 Nonlinear second-order PDE of hyperbolic type
35L75 Nonlinear hyperbolic PDE of higher (>2) order
35L80 Hyperbolic PDE of degenerate type
35L85 Unilateral problems; variational inequalities for hyperbolic PDE [See also 35R35, 49J40]
35L99 None of the above, but in this section
35Mxx Partial differential equations of special type (mixed, composite, etc.) {For degenerate types, see 35J70, 35K65, 35L80}
35M10 PDE of mixed type
35M20 PDE of composite type
35M99 None of the above, but in this section
35Nxx Overdetermined systems [See also 58G05, 58G07, 58Hxx]
35N05 Overdetermined systems with constant coefficients
35N10 Overdetermined systems with variable coefficients (general)
35N15 $\bar{\partial}$-Neumann problem and generalizations; formal complexes [See also 32F20 and 58G05]
35N99 None of the above, but in this section
35Pxx Spectral theory and eigenvalue problems for partial differential operators [See also 47Axx, 47Bxx, 47F05]
35P05 General spectral theory of PDE
35P10 Completeness of eigenfunctions, eigenfunction expansions for PDO
35P15 Estimation of eigenvalues, upper and lower bounds
35P20 Asymptotic distribution of eigenvalues and eigenfunctions for PDO
35P25 Scattering theory for PDE [See also 47A40]
35P30 Nonlinear eigenvalue problems, nonlinear spectral theory for PDO
35P99 None of the above, but in this section
35Qxx Equations of mathematical physics and other areas of application [See also 35J05, 35J10, 35K05, 35L05]
35Q05 Euler-Poisson-Darboux equation and generalizations
35Q15 Riemann-Hilbert problems [See also 30E25, 31A25, 31B20]
35Q30 Stokes and Navier-Stokes equations [See also 76D05, 76D07, 76N10]
35Q35 Other equations arising in fluid mechanics
35Q40 Equations from quantum mechanics
35Q51 Solitons [See also 58F07]
35Q53 KdV-like equations (Korteweg-de Vries, Burgers, sine-Gordon, sinh-Gordon, etc.) [See also 58F07]
35Q55 NLS-like (nonlinear Schrödinger) equations [See also 58F07]
35Q58 Other completely integrable equations [See also 58F07]
35Q60 Equations of electromagnetic theory and optics
35Q72 Other equations from mechanics
35Q75 PDE in relativity
35Q80 Applications of PDE in areas other than physics
35Q99 None of the above, but in this section
35Rxx Miscellaneous topics involving partial differential equations {For equations on manifolds, see 58Gxx; for manifolds of solutions, see 58Bxx; for stochastic PDE, see also 60H15}
35R05 PDE with discontinuous coefficients or data
35R10 Partial functional-differential or differential-difference equations, with or without deviating arguments
35R15 Partial differential equations on infinite-dimensional (e.g. function) spaces (= PDE in infinitely many variables) [See also 46Gxx, 58D25]
35R20 Partial operator-differential equations (i.e. PDE on finite-dimensional spaces for abstract space valued functions) [See also 34Gxx, 47A50, 47D03, 47D06, 47D09, 47H15, 47H20]
35R25 Improperly posed problems for PDE
35R30 Inverse problems (undetermined coefficients, etc.) for PDE
35R35 Free boundary problems for PDE
35R45 Partial differential inequalities
35R50 Partial differential equations of infinite order
35R60 Partial differential equations with randomness [See also 60H15]
35R70 PDE with multivalued right-hand sides
35R99 None of the above, but in this section
35Sxx Pseudodifferential operators and other generalizations of partial differential operators [See also 47G30, 58G15]
35S05 General theory of ΨDO
35S10 Initial value problems for ΨDO
35S15 Boundary value problems for ΨDO
35S30 Fourier integral operators
35S35 Topological aspects: intersection cohomology, stratified sets, etc. [See also 32C38, 32S40, 32S60, 58G07]
35S50 Paradifferential operators
35S99 None of the above, but in this section

39–XX FINITE DIFFERENCES AND FUNCTIONAL EQUATIONS
39–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
39–01 Instructional exposition (textbooks, tutorial papers, etc.)
39–02 Research exposition (monographs, survey articles)
39–03 Historical (must also be assigned at least one classification number from Section 01)
39–04 Explicit machine computation and programs (not the theory of computation or programming)
39–06 Proceedings, conferences, collections, etc.
39Axx Difference equations {For dynamical systems, see 58Fxx}
39A05 General
39A10 Difference equations [See also 33Dxx]
39A11 Stability of difference equations
39A12 Discrete version of topics in analysis
39A70 Difference operators [See also 47B39]
39A99 None of the above, but in this section
39Bxx Functional equations [See also 30D05]
39B05 General
39B12 Iteration theory, iterative and composite equations [See also 26A18, 30D05, 58F08]
39B22 Equations for real functions
39B32 Equations for complex functions [See also 30D05]
39B42 Matrix and operator equations
39B52 Equations for functions with more general domains and/or ranges
39B62 Systems of functional equations
39B72 Inequalities involving unknown functions [See also 26A51, 26Dxx]
39B99 None of the above, but in this section

40–XX SEQUENCES, SERIES, SUMMABILITY
40–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
40–01 Instructional exposition (textbooks, tutorial papers, etc.)
40–02 Research exposition (monographs, survey articles)
40–03 Historical (must also be assigned at least one classification number from Section 01)
40–04 Explicit machine computation and programs (not the theory of computation or programming)
40–06 Proceedings, conferences, collections, etc.
40Axx Convergence and divergence of infinite limiting processes
40A05 Convergence and divergence of series and sequences
40A10 Convergence and divergence of integrals
40A15 Convergence and divergence of continued fractions [See also 30B70]
40A20 Convergence and divergence of infinite products
40A25 Approximation to limiting values (summation of series, etc.) {For the Euler-Maclaurin summation formula, see 65B15}
40A30 Convergence and divergence of series and sequences of functions
40A99 None of the above, but in this section
40B05 Multiple sequences and series (should also be assigned at least one other classification number in this section)
40Cxx General summability methods
40C05 Matrix methods
40C10 Integral methods
40C15 Function-theoretic methods (including power series methods and semicontinuous methods)
40C99 None of the above, but in this section
40Dxx Direct theorems on summability
40D05 General theorems
40D09 Structure of summability fields
40D10 Tauberian constants and oscillation limits
40D15 Convergence factors and summability factors
40D20 Summability and bounded fields of methods
40D25 Inclusion and equivalence theorems
40D99 None of the above, but in this section
40Exx Inversion theorems
40E05 Tauberian theorems, general
40E10 Growth estimates
40E15 Lacunary inversion theorems
40E20 Tauberian constants
40E99 None of the above, but in this section

40F05 Absolute and strong summability
40Gxx Special methods of summability
40G05 Cesàro, Euler, Nörlund and Hausdorff methods
40G10 Abel, Borel and power series methods
40G99 None of the above, but in this section
40H05 Functional analytic methods in summability
40J05 Summability in abstract structures [See also 43A55, 46A35, 46B15]

41–XX APPROXIMATIONS AND EXPANSIONS {For all approximation theory in the complex domain, see 30E05 and 30E10; for all trigonometric approximation and interpolation, see 42A10 and 42A15; for numerical approximation, see 65Dxx}
41–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
41–01 Instructional exposition (textbooks, tutorial papers, etc.)
41–02 Research exposition (monographs, survey articles)
41–03 Historical (must also be assigned at least one classification number from Section 01)
41–04 Explicit machine computation and programs (not the theory of computation or programming)
41–06 Proceedings, conferences, collections, etc.
41A05 Interpolation [See also 42A15 and 65D05]
41A10 Approximation by polynomials {For approximation by trigonometric polynomials, see 42A10}
41A15 Spline approximation
41A17 Inequalities in approximation (Bernstein-, Jackson-, Nikol′skiĭ-type inequalities)
41A20 Approximation by rational functions
41A21 Padé approximation
41A25 Rate of convergence, degree of approximation
41A27 Inverse theorems
41A28 Simultaneous approximation
41A29 Approximation with constraints
41A30 Approximation by other special function classes
41A35 Approximation by operators (in particular, by integral operators)
41A36 Approximation by positive operators
41A40 Saturation
41A44 Best constants
41A45 Approximation by arbitrary linear expressions
41A46 Approximation by arbitrary nonlinear expressions; widths and entropy
41A50 Best approximation, Chebyshev systems
41A52 Uniqueness of best approximation
41A55 Approximate quadratures
41A58 Series expansions (e.g. Taylor, Lidstone series, but not Fourier series)
41A60 Asymptotic approximations, asymptotic expansions (steepest descent, etc.) [See also 30E15]
41A63 Multidimensional problems (should also be assigned at least one other classification number in this section)
41A65 Abstract approximation theory (approximation in normed linear spaces and other abstract spaces)
41A80 Remainders in approximation formulas
41A99 Miscellaneous topics

42–XX FOURIER ANALYSIS
42–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
42–01 Instructional exposition (textbooks, tutorial papers, etc.)
42–02 Research exposition (monographs, survey articles)
42–03 Historical (must also be assigned at least one classification number from Section 01)
42–04 Explicit machine computation and programs (not the theory of computation or programming)
42–06 Proceedings, conferences, collections, etc.
42Axx Fourier analysis in one variable
42A05 Trigonometric polynomials, inequalities, extremal problems
42A10 Trigonometric approximation
42A15 Trigonometric interpolation
42A16 Fourier coefficients, Fourier series of functions with special properties, special Fourier series {For automorphic theory, see mainly 11F30}
42A20 Convergence of Fourier and trigonometric series
42A24 Summability of Fourier and trigonometric series
42A28 Absolute convergence, absolute summability
42A32 Trigonometric series of special types (positive coefficients, monotonic coefficients, etc.)
42A38 Fourier and Fourier-Stieltjes transforms and other transforms of Fourier type
42A45 Multipliers
42A50 Conjugate functions, conjugate series, singular integrals
42A55 Lacunary series of trigonometric and other functions; Riesz products
42A61 Probabilistic methods
42A63 Uniqueness of trigonometric expansions, uniqueness of Fourier expansions, Riemann theory, localization
42A65 Completeness of sets of functions
42A70 Trigonometric moment problems
42A75 Classical almost periodic functions, mean periodic functions [See also 43A60]
42A82 Positive definite functions
42A85 Convolution, factorization
42A99 None of the above, but in this section
42Bxx Fourier analysis in several variables {For automorphic theory, see mainly 11F30}
42B05 Fourier series and coefficients
42B08 Summability
42B10 Fourier and Fourier-Stieltjes transforms and other transforms of Fourier type
42B15 Multipliers
42B20 Singular integrals (Calderón-Zygmund, etc.)
42B25 Maximal functions, Littlewood-Paley theory
42B30 H^p-spaces
42B99 None of the above, but in this section
42Cxx Nontrigonometric Fourier analysis
42C05 Orthogonal functions and polynomials, general theory [See also 33C45, 33C50, 33D45]
42C10 Fourier series in special orthogonal functions (Legendre polynomials, Walsh functions, etc.)
42C15 Series of general orthogonal functions, generalized Fourier expansions, nonorthogonal expansions
42C20 Rearrangements and other transformations of Fourier and other orthogonal series
42C25 Uniqueness and localization for orthogonal series
42C30 Completeness of sets of functions
42C99 None of the above, but in this section

43–XX ABSTRACT HARMONIC ANALYSIS {For other analysis on topological and Lie groups, see 22Exx}
43–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
43–01 Instructional exposition (textbooks, tutorial papers, etc.)
43–02 Research exposition (monographs, survey articles)
43–03 Historical (must also be assigned at least one classification number from Section 01)
43–04 Explicit machine computation and programs (not the theory of computation or programming)
43–06 Proceedings, conferences, collections, etc.
43A05 Measures on groups and semigroups, etc.
43A07 Means on groups, semigroups, etc.; amenable groups
43A10 Measure algebras on groups, semigroups, etc.
43A15 L^p-spaces and other function spaces on groups, semigroups, etc.
43A17 Analysis on ordered groups, H^p-theory
43A20 L^1-algebras on groups, semigroups, etc.
43A22 Homomorphisms and multipliers of function spaces on groups, semigroups, etc.
43A25 Fourier and Fourier-Stieltjes transforms on locally compact abelian groups
43A30 Fourier and Fourier-Stieltjes transforms on nonabelian groups and on semigroups, etc.
43A32 Other transforms and operators of Fourier type
43A35 Positive definite functions on groups, semigroups, etc.
43A40 Character groups and dual objects
43A45 Spectral synthesis on groups, semigroups, etc.
43A46 Special sets (thin sets, Kronecker sets, Helson sets, Ditkin sets, Sidon sets, etc.)
43A50 Convergence of Fourier series and of inverse transforms
43A55 Summability methods on groups, semigroups, etc. [See also 40J05]
43A60 Almost periodic functions on groups and semigroups and their generalizations (recurrent functions, distal functions, etc.); almost automorphic functions
43A62 Hypergroups
43A65 Representations of groups, semigroups, etc. [See also 22A10, 22A20, 22Dxx, 22E45]
43A70 Analysis on specific locally compact abelian groups [See also 11R56, 22B05]
43A75 Analysis on specific compact groups
43A77 Analysis on general compact groups
43A80 Analysis on other specific Lie groups [See also 22Exx]
43A85 Analysis on homogeneous spaces
43A90 Spherical functions [See also 22E45, 22E46, 33C65, 33D55]
43A95 Categorical methods [See also 46Mxx]
43A99 Miscellaneous topics

44–XX INTEGRAL TRANSFORMS, OPERATIONAL CALCULUS {For fractional derivatives and integrals, see 26A33. For Fourier transforms, see 42A38, 42B10. For integral transforms in distribution spaces, see 46F12. For numerical methods, see 65R10}
44–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
44–01 Instructional exposition (textbooks, tutorial papers, etc.)
44–02 Research exposition (monographs, survey articles)

44–03 Historical (must also be assigned at least one classification number from Section 01)
44–04 Explicit machine computation and programs (not the theory of computation or programming)
44–06 Proceedings, conferences, collections, etc.
44A05 General transforms [See also 42A38]
44A10 Laplace transform
44A12 Radon transform [See also 92C55]
44A15 Special transforms (Legendre, Hilbert, etc.)
44A20 Transforms of special functions
44A30 Multiple transforms
44A35 Convolution
44A40 Calculus of Mikusiński and other operational calculi
44A45 Classical operational calculus
44A55 Discrete operational calculus
44A60 Moment problems
44A99 Miscellaneous topics

45–XX INTEGRAL EQUATIONS
45–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
45–01 Instructional exposition (textbooks, tutorial papers, etc.)
45–02 Research exposition (monographs, survey articles)
45–03 Historical (must also be assigned at least one classification number from Section 01)
45–04 Explicit machine computation and programs (not the theory of computation or programming)
45–06 Proceedings, conferences, collections, etc.
45A05 Linear integral equations
45B05 Fredholm integral equations
45C05 Eigenvalue problems [See also 34Lxx, 35Pxx, 45P05, 47A75]
45D05 Volterra integral equations [See also 34A12]
45Exx Singular integral equations [See also 30E20, 30E25, 44A15, 44A35]
45E05 Integral equations with kernels of Cauchy type [See also 35J15]
45E10 Integral equations of the convolution type (Abel, Picard, Toeplitz and Wiener-Hopf type) [See also 47B35]
45E99 None of the above, but in this section
45Fxx Systems of linear integral equations
45F05 Systems of nonsingular linear integral equations
45F10 Dual, triple, etc., integral and series equations
45F15 Systems of singular linear integral equations
45F99 None of the above, but in this section
45Gxx Nonlinear integral equations [See also 47H15]
45G05 Singular nonlinear integral equations
45G10 Other nonlinear integral equations
45G15 Systems of nonlinear integral equations
45H05 Miscellaneous special kernels [See also 44A15]
45J05 Integro-ordinary differential equations
45K05 Integro-partial differential equations
45Lxx Approximation of solutions
45L05 Theoretical approximation of solutions
45L10 Numerical approximation of solutions {For numerical analysis, see 65R20}
45L99 None of the above, but in this section
45Mxx Qualitative behavior
45M05 Asymptotics
45M10 Stability theory
45M15 Periodic solutions
45M20 Positive solutions
45M99 None of the above, but in this section
45N05 Abstract integral equations, integral equations in abstract spaces
45P05 Integral operators [See also 47B38, 47G10]

46–XX FUNCTIONAL ANALYSIS {For manifolds modeled on topological linear spaces, see 57N20, 58Bxx}
46–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
46–01 Instructional exposition (textbooks, tutorial papers, etc.)
46–02 Research exposition (monographs, survey articles)
46–03 Historical (must also be assigned at least one classification number from Section 01)
46–04 Explicit machine computation and programs (not the theory of computation or programming)
46–06 Proceedings, conferences, collections, etc.
46Axx Topological linear spaces and related structures {For function spaces, see 46Exx}
46A03 General theory of locally convex spaces
46A04 Locally convex Fréchet spaces and (DF)-spaces
46A08 Barrelled spaces, bornological spaces
46A11 Spaces determined by compactness or summability properties (nuclear spaces, Schwartz spaces, Montel spaces, etc.)
46A13 Spaces defined by inductive or projective limits (LB, LF, etc.) [See also 46M40]
46A16 Not locally convex spaces (metrizable topological linear spaces, locally bounded spaces, quasi-Banach spaces, etc.)
46A17 Bornologies and related structures; Mackey convergence, etc.
46A19 Other "topological" linear spaces (convergence spaces, ranked spaces, spaces with a metric taking values in an ordered structure more general than R, etc.)
46A20 Duality theory
46A22 Theorems of Hahn-Banach type; extension and lifting of functionals and operators [See also 46M10]
46A25 Reflexivity and semi-reflexivity [See also 46B10]
46A30 Open mapping and closed graph theorems; completeness (including B-, B_r-completeness)
46A32 Spaces of linear operators; topological tensor products; approximation properties [See also 46B28, 46M05, 47D15, 47D50]
46A35 Summability and bases [See also 46B15]
46A40 Ordered topological linear spaces, vector lattices [See also 06F20, 46B40, 46B42]
46A45 Sequence spaces (including Köthe sequence spaces) [See also 46B45]
46A50 Compactness in topological linear spaces; angelic spaces, etc.
46A55 Convex sets in topological linear spaces; Choquet theory [See also 52A07]
46A70 Saks spaces and their duals (strict topologies, mixed topologies, two-norm spaces, co-Saks spaces, etc.)
46A80 Modular spaces
46A99 None of the above, but in this section
46Bxx Normed linear spaces and Banach spaces; Banach lattices {For function spaces, see 46Exx}
46B03 Isomorphic theory (including renorming) of Banach spaces
46B04 Isometric theory of Banach spaces
46B07 Local theory of Banach spaces
46B08 Ultraproduct techniques in Banach space theory [See also 46M07]
46B09 Probabilistic methods in Banach space theory [See also 60Bxx]
46B10 Duality and reflexivity [See also 46A25]
46B15 Summability and bases [See also 46A35]
46B20 Geometry and structure of normed linear spaces
46B22 Radon-Nikodým, Kreĭn-Mil′man and related properties [See also 46G10]
46B25 Classical Banach spaces in the general theory
46B26 Nonseparable Banach spaces
46B28 Spaces of operators; tensor products; approximation properties [See also 46A32, 46M05, 47D15, 47D50]
46B40 Ordered normed spaces [See also 46A40, 46B42]
46B42 Banach lattices [See also 46A40, 46B40]
46B45 Banach sequence spaces [See also 46A45]
46B70 Interpolation between normed linear spaces [See also 46M35]
46B99 None of the above, but in this section
46Cxx Inner product spaces and their generalizations, Hilbert spaces {For function spaces, see 46Exx}
46C05 Hilbert and pre-Hilbert spaces: geometry and topology (including spaces with semidefinite inner product)
46C15 Characterizations of Hilbert spaces
46C20 Spaces with indefinite inner product
46C50 Generalizations of inner products (semi-inner products, partial inner products, etc.)
46C99 None of the above, but in this section
46Exx Linear function spaces and their duals [See also 30H05, 32E25, 46F05; for function algebras, see 46J10]
46E05 Lattices of continuous, differentiable or analytic functions
46E10 Topological linear spaces of continuous, differentiable or analytic functions
46E15 Banach spaces of continuous, differentiable or analytic functions
46E20 Hilbert spaces of continuous, differentiable or analytic functions
46E22 Hilbert spaces with reproducing kernels (= [proper] functional Hilbert spaces)
46E25 Rings and algebras of continuous, differentiable or analytic functions {For Banach function algebras, see 46J10, 46J15}
46E27 Spaces of measures [See also 28A33, 46Gxx]
46E30 Spaces of measurable functions (L^p-spaces, Orlicz spaces, Köthe function spaces, Lorentz spaces, rearrangement invariant spaces, ideal spaces, etc.)
46E35 Sobolev spaces and other spaces of "smooth" functions, embedding theorems, trace theorems
46E39 Sobolev (and similar kinds of) spaces of functions of discrete variables
46E40 Spaces of vector- and operator-valued functions
46E50 Spaces of differentiable or holomorphic functions on infinite-dimensional spaces [See also 46G20]
46E99 None of the above, but in this section
46Fxx Distributions, generalized functions, distribution spaces {For distribution theory on nonlinear spaces, see 58Cxx}
46F05 Topological linear spaces of test functions, distributions and ultradistributions [See also 46E10, 46E35]
46F10 Operations with distributions
46F12 Integral transforms in distribution spaces [See also 42–XX, 44–XX]

46F15 Hyperfunctions, analytic functionals [See also 32A25, 32A45, 32C35, 58G07]
46F20 Distributions and ultradistributions as boundary values of analytic functions [See also 30D40, 30E25, 32A40]
46F25 Distributions on infinite-dimensional spaces [See also 58C35]
46F99 None of the above, but in this section
46Gxx Measure, integration, derivative, holomorphy (all involving infinite-dimensional spaces) [See also 28–XX]{For nonlinear functional analysis, see 47Hxx, 58–XX, especially 58Cxx}
46G05 Derivatives [See also 58C20, 58C25]
46G10 Vector-valued measures and integration [See also 28Bxx, 46B22]
46G12 Measure and integration on abstract linear spaces [See also 28C20]
46G15 Functional analytic lifting theory [See also 28A51]
46G20 Infinite-dimensional holomorphy [See also 32–XX, 46E50, 58B12, 58C10]
46G99 None of the above, but in this section
46Hxx Topological algebras, normed rings and algebras, Banach algebras {For group algebras, convolution algebras and measure algebras, see 43A10, 43A20}
46H05 General theory of topological algebras
46H10 Ideals and subalgebras
46H15 Representations of topological algebras
46H20 Structure, classification of topological algebras
46H25 Normed modules and Banach modules, topological modules (if not placed in 13–XX or 16–XX)
46H30 Functional calculus in topological algebras [See also 47A60]
46H35 Topological algebras of operators [See mainly 47D30, and also 47D25, 47D50]
46H40 Automatic continuity
46H70 Nonassociative topological algebras [See also 46K70, 46L70]
46H99 None of the above, but in this section
46Jxx Commutative Banach algebras and commutative topological algebras [See also 46E25]
46J05 General theory of commutative topological algebras
46J10 Banach algebras of continuous functions, function algebras [See also 46E25]
46J15 Banach algebras of differentiable or analytic functions, H^p-spaces [See also 30D55, 30H05, 32A35, 32A37, 32E25, 42B30]
46J20 Ideals, maximal ideals, boundaries
46J25 Representations of commutative topological algebras
46J30 Subalgebras
46J40 Structure, classification of commutative topological algebras
46J45 Radical Banach algebras
46J99 None of the above, but in this section
46Kxx Topological (rings and) algebras with an involution [See also 16W10]
46K05 General theory of topological algebras with involution
46K10 Representations of topological algebras with involution
46K15 Hilbert algebras
46K50 Nonselfadjoint (sub)algebras in algebras with involution
46K70 Nonassociative topological algebras with an involution [See also 46H70, 46L70]
46K99 None of the above, but in this section
46Lxx Selfadjoint operator algebras (C^*-algebras, von Neumann (W^*-) algebras, etc.) [See also 22D25]
46L05 General theory of C^*-algebras
46L10 General theory of von Neumann algebras
46L30 States
46L35 Classifications of C^*-algebras, factors
46L37 Subfactors and their classification
46L40 Automorphisms
46L45 Decomposition theory for C^*-algebras
46L50 Noncommutative measure, integration and probability
46L55 Noncommutative dynamical systems [See also 28Dxx, 54H20, 58Fxx]
46L57 Derivations, dissipations and positive semigroups in C^*-algebras
46L60 Applications of selfadjoint operator algebras to physics [See also 46N50, 46N55, 47D45, 81T05, 82B10, 82C10]
46L70 Nonassociative selfadjoint operator algebras [See also 46H70, 46K70]
46L80 K-theory and operator algebras (including cyclic theory) [See also 18F25, 19Kxx, 46M20, 55Rxx, 58G12]
46L85 Noncommutative topology [See also 58B30, 58G12]
46L87 Noncommutative differential geometry [See also 58B30, 58G12]
46L89 Other "noncommutative" mathematics based on C^*-algebra theory [See also 58B30, 58G12]
46L99 None of the above, but in this section
46Mxx Methods of category theory in functional analysis [See also 18–XX]
46M05 Tensor products [See also 46A32, 46B28, 47A80]
46M07 Ultraproducts [See also 46B08, 46S20]
46M10 Projective and injective objects [See also 46A22]
46M15 Functors {For K-theory and EXT, see 19K33, 46L80, 46M20}
46M20 Methods of algebraic topology (cohomology, sheaf and bundle theory, etc.) [See also 14F05, 18Fxx, 19Kxx, 32Cxx, 32Lxx, 46L80, 55Rxx]
46M35 Abstract interpolation of topological vector spaces [See also 46B70]
46M40 Inductive and projective limits [See also 46A13]
46M99 None of the above, but in this section
46Nxx Miscellaneous applications of functional analysis [See also 47Nxx]
46N10 Applications in optimization, convex analysis, mathematical programming, economics
46N20 Applications to differential and integral equations
46N30 Applications in probability theory and statistics
46N40 Applications in numerical analysis [See also 65Jxx]
46N50 Applications in quantum physics
46N55 Applications in statistical physics
46N60 Applications in biology and other sciences
46N99 None of the above, but in this section
46Sxx Other (nonclassical) types of functional analysis [See also 47Sxx]
46S10 Functional analysis over fields other than R or C or the quaternions; non-Archimedean functional analysis [See also 12J25, 32P05]
46S20 Nonstandard functional analysis [See also 03H05]
46S30 Constructive functional analysis [See also 03F65]
46S40 Fuzzy functional analysis [See also 04A72]
46S50 Functional analysis in probabilistic metric linear spaces
46S99 None of the above, but in this section

47–XX OPERATOR THEORY
47–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
47–01 Instructional exposition (textbooks, tutorial papers, etc.)
47–02 Research exposition (monographs, survey articles)
47–03 Historical (must also be assigned at least one classification number from Section 01)
47–04 Explicit machine computation and programs (not the theory of computation or programming)
47–06 Proceedings, conferences, collections, etc.
47Axx General theory of linear operators
47A05 General (adjoints, conjugates, products, inverses, domains, ranges, etc.)
47A10 Spectrum, resolvent
47A11 Local spectral properties
47A12 Numerical range
47A13 Several-variable spectral theory
47A15 Invariant subspaces
47A20 Dilations, extensions, compressions
47A25 Spectral sets
47A30 Norms (inequalities, more than one norm, etc.)
47A35 Ergodic theory [See also 28Dxx]
47A40 Scattering theory [See also 34L25, 35P25, 81Uxx]
47A45 Canonical models for contractions and nonselfadjoint operators
47A48 Operator colligations (= nodes)
47A50 Equations and inequalities involving linear operators, with vector unknowns
47A53 (Semi-) Fredholm operators; index theories [See also 58B10, 58G12]
47A55 Perturbation theory
47A56 Functions whose values are linear operators (operator and matrix pencils, etc.)
47A57 Operator methods in interpolation, moment and extension problems [See also 30E05, 42A70, 42A82]
47A58 Operator approximation theory
47A60 Functional calculus
47A62 Equations involving linear operators, with operator unknowns
47A63 Operator inequalities, operator means, shorted operators, etc.
47A65 Structure theory
47A66 (Non)quasitriangular, (non)quasidiagonal operators
47A67 Representation theory
47A68 Factorization theory (including Wiener-Hopf and spectral factorizations)
47A70 (Generalized) eigenfunction expansions; rigged Hilbert spaces
47A75 Eigenvalue problems [See also 49Rxx]
47A80 Tensor products of operators [See also 46M05]
47A99 None of the above, but in this section
47Bxx Special classes of linear operators
47B06 Riesz operators; eigenvalue distributions; approximation numbers, s-numbers, Kolmogorov numbers, entropy numbers, etc. of operators
47B07 Operators defined by compactness properties
47B10 Operators belonging to operator ideals (nuclear, p-summing, in the Schatten-von Neumann classes, etc.) [See also 47D50]
47B15 Hermitian and normal operators (spectral measures, functional calculus, etc.)
47B20 Subnormal operators, hyponormal operators, etc.
47B25 Symmetric and selfadjoint operators (unbounded)
47B35 Toeplitz operators, Hankel operators, Wiener-Hopf operators [See also 45P05, 47G10 for other integral operators; see also 32H10, 32M15]
47B37 Operators on special spaces (weighted shifts, operators on sequence spaces, etc.)

47B38 Operators on function spaces (including composition operators, kernel operators)
47B39 Difference operators [See also 39A70]
47B40 Spectral operators, decomposable operators, well-bounded operators, etc.
47B44 Accretive operators, dissipative operators, etc.
47B47 Commutators, derivations, elementary operators, etc.
47B48 Operators on Banach algebras
47B49 Transformers (= operators on spaces of operators)
47B50 Operators on spaces with an indefinite metric
47B60 Operators on ordered spaces
47B65 Positive operators and order-bounded operators
47B80 Random operators [See also 60H25]
47B99 None of the above, but in this section
47Cxx Individual linear operators as elements of algebraic systems
47C05 Operators in algebras
47C10 Operators in $*$-algebras
47C15 Operators in C^*- or von Neumann algebras
47C99 None of the above, but in this section
47Dxx Algebraic systems of linear operators [See also 46Lxx]
47D03 (Semi)groups of linear operators {For nonlinear operators, see 47H20; see also 20M20}
47D06 One-parameter semigroups and linear evolution equations
47D07 Markov semigroups {For Markov processes, see 60Jxx}
47D09 Operator cosine functions and higher-order Cauchy problems
47D15 Linear spaces of operators [See also 46A32, 46B28]
47D20 Convex sets and cones of operators [See also 90C25, 90C31]
47D25 Operator algebras on Hilbert space
47D27 Dual operator algebras
47D30 Operator algebras on Banach spaces and other linear topological spaces
47D35 Dual spaces of operator algebras and topological groups
47D40 Algebras of unbounded operators
47D45 Applications of operator algebras to physics [See also 46L60, 46N50, 46N55, 47N50, 47N55]
47D50 Operator ideals
47D99 None of the above, but in this section
47E05 Ordinary differential operators [See also 34Bxx, 34Lxx, 58F19]
47F05 Partial differential operators [See also 35Pxx, 58G05]
47Gxx Integral, integro-differential, and pseudodifferential operators
47G10 Integral operators [See also 45P05]
47G20 Integro-differential operators [See also 45J05, 45K05]
47G30 Pseudodifferential operators [See also 35Sxx, 58G15]
47G99 None of the above, but in this section
47Hxx Nonlinear operators {For global and geometric aspects, see 58–XX, especially 58Cxx}
47H04 Set-valued operators [See also 28B20, 54C60, 58C06]
47H05 Monotone operators (with respect to duality)
47H06 Accretive operators, dissipative operators, etc.
47H07 Monotone and positive operators on ordered Banach spaces or other ordered topological vector spaces
47H09 Nonexpansive mappings, and their generalizations (ultimately compact mappings, measures of noncompactness, A-proper mappings, K-set contractions, etc.)
47H10 Fixed-point theorems [See also 54H25, 55M20, 58C30]
47H11 Degree theory [See also 55M25, 58C30]
47H12 Spectral theory of nonlinear operators [See also 58C40]
47H15 Equations involving nonlinear operators [See also 58E07 for abstract bifurcation theory]
47H17 Methods for solving equations involving nonlinear operators [See also 58C15] {For numerical analysis, see 65J15}
47H19 Inequalities involving nonlinear operators [See also 49J27, 49J40, 49K27]
47H20 Semigroups of nonlinear operators and nonlinear evolution equations [See also 58D07]
47H30 Particular nonlinear operators (superposition, Hammerstein, Nemytskiĭ, Uryson, hysteresis operators, etc.) [See also 45P05]
47H40 Random operators [See also 60H25]
47H99 None of the above, but in this section
47Nxx Miscellaneous applications of operator theory [See also 46Nxx]
47N10 Applications in optimization, convex analysis, mathematical programming, economics
47N20 Applications to differential and integral equations
47N30 Applications in probability theory and statistics
47N40 Applications in numerical analysis [See also 65Jxx]
47N50 Applications in quantum physics
47N55 Applications in statistical physics
47N60 Applications in biology and other sciences
47N70 Applications in systems theory, circuits, etc.
47N99 None of the above, but in this section
47Sxx Other (nonclassical) types of operator theory [See also 46Sxx]
47S10 Operator theory over fields other than R, C or the quaternions; non-Archimedean operator theory
47S20 Nonstandard operator theory [See also 03H05]
47S30 Constructive operator theory [See also 03F65]
47S40 Fuzzy operator theory [See also 04A72]
47S50 Operator theory in probabilistic metric linear spaces
47S99 None of the above, but in this section

49–XX CALCULUS OF VARIATIONS AND OPTIMAL CONTROL; OPTIMIZATION [See also 34H05, 65Kxx, 90Cxx, 93–XX]
49–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
49–01 Instructional exposition (textbooks, tutorial papers, etc.)
49–02 Research exposition (monographs, survey articles)
49–03 Historical (must also be assigned at least one classification number from Section 01)
49–04 Explicit machine computation and programs (not the theory of computation or programming)
49–06 Proceedings, conferences, collections, etc.
49Jxx Existence theory for optimal solutions
49J05 Free problems in one independent variable
49J10 Free problems in two or more independent variables
49J15 Optimal control problems involving ordinary differential equations
49J20 Optimal control problems involving partial differential equations
49J22 Optimal control problems involving integral equations
49J24 Optimal control problems involving differential inclusions
49J25 Optimal control problems involving equations with retarded arguments [See also 34K35]
49J27 Problems in abstract spaces [See also 90C48]
49J30 Optimal solutions belonging to restricted classes (Lipschitz controls, bang-bang controls, etc.)
49J35 Minimax problems
49J40 Variational methods including variational inequalities
49J45 Problems involving semicontinuity and convergence
49J50 Fréchet and Gateaux differentiability [See also 46G05, 58C20]
49J52 Nonsmooth analysis (other weak concepts of optimality) [See also 58C20, 90C48]
49J55 Problems involving randomness [See also 93E20]
49J99 None of the above, but in this section
49Kxx Necessary conditions and sufficient conditions for optimality
49K05 Free problems in one independent variable
49K10 Free problems in two or more independent variables
49K15 Problems involving ordinary differential equations
49K20 Problems involving partial differential equations
49K22 Problems involving integral equations
49K24 Problems involving differential inclusions
49K25 Problems involving equations with retarded arguments [See also 34K35]
49K27 Problems in abstract spaces [See also 90C48, 93C25]
49K30 Optimal solutions belonging to restricted classes
49K35 Minimax problems
49K40 Sensitivity of optimal solutions in the presence of perturbations
49K45 Problems involving randomness [See also 93E20]
49K99 None of the above, but in this section
49Lxx Carathéodory, Hamilton-Jacobi theories, including dynamic programming
49L05 Free problems and problems involving ordinary differential equations
49L10 Free problems and problems involving partial differential equations
49L15 Problems in abstract spaces or problems involving functional relations other than differential equations
49L20 Dynamic programming method
49L25 Viscosity solutions
49L99 None of the above, but in this section
49Mxx Methods of successive approximations {For discrete problems, see 90Cxx; see also 65Kxx}
49M05 Methods based on necessary conditions
49M07 Gradient methods
49M10 Methods of steepest descent type
49M15 Methods of Newton-Raphson, Galerkin and Ritz types
49M20 Methods of relaxation type
49M25 Finite difference methods
49M27 Decomposition methods
49M29 Multiplier methods
49M30 Other methods, not based on necessary conditions (penalty function, etc.)
49M35 Methods of linear programming type [See also 90C05]
49M37 Nonlinear programming [See also 90C30]
49M39 Semi-infinite programming [See also 90C34]
49M40 Methods of quadratic programming type [See also 90C20]
49M45 Methods of convex programming type [See also 90C25]
49M49 Geometric programming [See also 90C28]
49M99 None of the above, but in this section

49Nxx Miscellaneous topics
49N05 Linear optimal control problems [See also 93C05]
49N10 Linear-quadratic problems
49N15 Duality theory
49N20 Periodic optimization
49N25 Impulsive optimal control problems [See also 93C57]
49N30 Problems with incomplete information [See also 93C41]
49N35 Closed-loop controls
49N40 Open-loop controls
49N45 Inverse problems in calculus of variations
49N50 Inverse problems in optimal control theory
49N55 Noneconomic applications of optimal control theory and differential games [See also 90D25]
49N60 Regularity of solutions in the calculus of variations
49N65 Applications of measurable selections to control theory [See also 28B20, 26E25]
49N99 None of the above, but in this section
49Qxx Manifolds [See also 58Fxx]
49Q05 Minimal surfaces [See also 53A10, 58E12]
49Q10 Optimization of the shape other than minimal surfaces [See also 73K40, 90C90]
49Q12 Sensitivity analysis
49Q15 Geometric measure and integration theory, integral and normal currents [See also 28A75, 32C30, 58A25, 58C35]
49Q20 Variational problems in a geometric measure-theoretic setting
49Q25 Surface area
49Q99 None of the above, but in this section
49Rxx Variational methods {For eigenvalues of operators, see 47A75}
49R05 Variational approach to eigenvalues
49R10 Rayleigh-Ritz methods
49R15 Weinstein and Aronszajn methods, intermediate problems
49R20 Linear operators in Hilbert spaces
49R99 None of the above, but in this section
49S05 Variational principles of physics

51–XX GEOMETRY {For algebraic geometry, see 14–XX}
51–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
51–01 Instructional exposition (textbooks, tutorial papers, etc.)
51–02 Research exposition (monographs, survey articles)
51–03 Historical (must also be assigned at least one classification number from Section 01)
51–04 Explicit machine computation and programs (not the theory of computation or programming)
51–06 Proceedings, conferences, collections, etc.
51Axx Linear incidence geometry
51A05 General theory and projective geometries
51A10 Homomorphism, automorphism and dualities
51A15 Structures with parallelism
51A20 Configuration theorems
51A25 Algebraization [See also 12Kxx, 20N05]
51A30 Desarguesian and Pappian geometries
51A35 Non-Desarguesian affine and projective planes
51A40 Translation planes and spreads
51A45 Incidence structures embeddable into projective geometries
51A50 Polar geometry, symplectic spaces, orthogonal spaces
51A99 None of the above, but in this section
51Bxx Nonlinear incidence geometry
51B05 General theory
51B10 Möbius geometries
51B15 Laguerre geometries
51B20 Minkowski geometries
51B25 Lie geometries
51B99 None of the above, but in this section
51C05 Ring geometry (Hjelmslev, Barbilian, etc.)
51Dxx Geometric closure systems
51D05 Abstract (Maeda) geometries
51D10 Abstract geometries with exchange axiom
51D15 Abstract geometries with parallelism
51D20 Combinatorial geometries [See also 05B25, 05B35]
51D25 Lattices of subspaces [See also 05B35]
51D30 Continuous geometries and related topics [See also 06Cxx]
51D99 None of the above, but in this section
51Exx Finite geometry and special incidence structures
51E05 General block designs [See also 05B05]
51E10 Steiner systems
51E12 Generalized quadrangles, generalized polygons
51E14 Finite partial geometries (general), nets, partial spreads
51E15 Affine and projective planes
51E20 Combinatorial structures in finite projective spaces [See also 05Bxx]
51E21 Blocking sets, ovals, k-arcs
51E22 Linear codes and caps in Galois spaces [See also 94B05]
51E23 Spreads and packing problems
51E24 Buildings and the geometry of diagrams
51E25 Other finite nonlinear geometries
51E26 Other finite linear geometries
51E30 Other finite incidence structures [See also 05B30]
51E99 None of the above, but in this section
51Fxx Metric geometry
51F05 Absolute planes
51F10 Absolute spaces
51F15 Reflection groups, reflection geometries [See also 20H10, 20H15; for Coxeter groups, see 20F55]
51F20 Congruence and orthogonality [See also 20H05]
51F25 Orthogonal and unitary groups [See also 20H05]
51F99 None of the above, but in this section
51G05 Ordered geometries (ordered incidence structures, etc.)
51Hxx Topological geometry
51H05 General theory
51H10 Topological linear incidence structures
51H15 Topological nonlinear incidence structures
51H20 Topological geometries on manifolds [See also 57–XX]
51H25 Geometries with differentiable structure [See also 53Cxx, 53C70]
51H30 Geometries with algebraic manifold structure [See also 14–XX]
51H99 None of the above, but in this section
51Jxx Incidence groups
51J05 General theory
51J10 Projective incidence groups
51J15 Kinematic spaces
51J20 Representation by near-fields and near-algebras [See also 12K05, 16Y30]
51J99 None of the above, but in this section
51Kxx Distance geometry
51K05 General theory
51K10 Synthetic differential geometry
51K99 None of the above, but in this section
51Lxx Geometric order structures [See also 53C75]
51L05 Geometry of orders of nondifferentiable curves
51L10 Directly differentiable curves
51L15 n-vertex theorems via direct methods
51L20 Geometry of orders of surfaces
51L99 None of the above, but in this section
51Mxx Real and complex geometry
51M04 Elementary problems in Euclidean geometries
51M05 Euclidean geometries (general) and generalizations
51M09 Elementary problems in hyperbolic and elliptic geometries
51M10 Hyperbolic and elliptic geometries (general) and generalizations
51M15 Geometric constructions
51M16 Inequalities and extremum problems {For convex problems, see 52A40}
51M20 Polyhedra and polytopes; regular figures, division of spaces [See also 51F15]
51M25 Length, area and volume [See also 26B15]
51M30 Line geometries and their generalizations [See also 53A25]
51M35 Synthetic treatment of fundamental manifolds in projective geometries (Grassmannians, Veronesians and their generalizations) [See also 14M15]
51M99 None of the above, but in this section
51Nxx Analytic and descriptive geometry
51N05 Descriptive geometry [See also 65D17, 68U07]
51N10 Affine analytic geometry
51N15 Projective analytic geometry
51N20 Euclidean analytic geometry
51N25 Analytic geometry with other transformation groups
51N30 Geometry of classical groups [See also 20Gxx, 14L35]
51N35 Questions of classical algebraic geometry [See also 14Nxx]
51N99 None of the above, but in this section
51P05 Geometry and physics (should also be assigned at least one other classification number from Sections 70–86)

52–XX CONVEX AND DISCRETE GEOMETRY
52–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
52–01 Instructional exposition (textbooks, tutorial papers, etc.)
52–02 Research exposition (monographs, survey articles)
52–03 Historical (must also be assigned at least one classification number from Section 01)
52–04 Explicit machine computation and programs (not the theory of computation or programming)
52–06 Proceedings, conferences, collections, etc.
52Axx General convexity
52A01 Axiomatic and generalized convexity
52A05 Convex sets without dimension restrictions
52A07 Convex sets in topological vector spaces [See also 46A55]
52A10 Convex sets in 2 dimensions (including convex curves) [See also 53A04]

52A15 Convex sets in 3 dimensions (including convex surfaces) [See also 53A05, 53C45]
52A20 Convex sets in n dimensions (including convex hypersurfaces) [See also 53A07, 53C45]
52A21 Finite-dimensional Banach spaces (including special norms, zonoids, etc.) [See also 46Bxx]
52A22 Random convex sets and integral geometry [See also 53C65, 60D05]
52A27 Approximation by convex sets
52A30 Variants of convex sets (star-shaped, (m, n)-convex, etc.)
52A35 Helly-type theorems
52A37 Other problems of combinatorial convexity
52A38 Length, area, volume [See also 26B15, 28A75, 49Q20]
52A39 Mixed volumes and related topics
52A40 Inequalities and extremum problems
52A41 Convex functions and convex programs [See also 26B25, 90C25]
52A55 Spherical and hyperbolic convexity
52A99 None of the above, but in this section
52Bxx Polytopes and polyhedra
52B05 Combinatorial properties (number of faces, shortest paths, etc.) [See also 05Cxx]
52B10 Three-dimensional polytopes
52B11 n-dimensional polytopes
52B12 Special polytopes (linear programming, centrally symmetric, etc.)
52B15 Symmetry properties of polytopes
52B20 Lattice polytopes (including relations with commutative algebra and algebraic geometry) [See also 06A08, 13F20, 13Hxx]
52B30 Arrangements of hyperplanes
52B35 Gale and other diagrams
52B40 Matroids (realizations in the context of convex polytopes, convexity in combinatorial structures, etc.) [See also 05B35]
52B45 Dissections and valuations (Hilbert's third problem, etc.)
52B55 Computational aspects related to convexity {For computational geometry and algorithms, see 68Q20, 68Q25, 68U05; for numerical algorithms, see 65Yxx}
52B60 Isoperimetric problems for polytopes
52B70 Polyhedral manifolds
52B99 None of the above, but in this section
52Cxx Discrete geometry
52C05 Lattices and convex bodies in 2 dimensions [See also 11H06, 11H31, 11P21]
52C07 Lattices and convex bodies in n dimensions [See also 11H06, 11H31, 11P21]
52C10 Erdős problems and related topics of discrete geometry [See also 11Hxx]
52C15 Packing and covering in 2 dimensions [See also 05B40, 11H31]
52C17 Packing and covering in n dimensions [See also 05B40, 11H31]
52C20 Tilings in 2 dimensions [See also 05B45, 51M20]
52C22 Tilings in n dimensions [See also 05B45, 51M20]
52C25 Rigidity and flexibility of structures [See also 70B15]
52C99 None of the above, but in this section

53–XX DIFFERENTIAL GEOMETRY {For differential topology, see 57Rxx. For foundational questions of differentiable manifolds, see 58Axx}
53–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
53–01 Instructional exposition (textbooks, tutorial papers, etc.)
53–02 Research exposition (monographs, survey articles)
53–03 Historical (must also be assigned at least one classification number from Section 01)
53–04 Explicit machine computation and programs (not the theory of computation or programming)
53–06 Proceedings, conferences, collections, etc.
53Axx Classical differential geometry
53A04 Curves in Euclidean space
53A05 Surfaces in Euclidean space
53A07 Higher-dimension and -codimension surfaces in Euclidean n-space
53A10 Minimal surfaces, surfaces with prescribed mean curvature [See also 49Q05, 49Q10, 53C42]
53A15 Affine differential geometry
53A17 Kinematics
53A20 Projective differential geometry
53A25 Differential line geometry
53A30 Conformal differential geometry
53A35 Non-Euclidean differential geometry
53A40 Other special differential geometries
53A45 Vector and tensor analysis
53A50 Spinor analysis
53A55 Differential invariants (local theory), geometric objects
53A60 Geometry of webs [See also 14C21, 20N05]
53A99 None of the above, but in this section
53Bxx Local differential geometry
53B05 Linear and affine connections
53B10 Projective connections
53B15 Other connections
53B20 Local Riemannian geometry
53B21 Methods of Riemannian geometry
53B25 Local submanifolds [See also 53C40]
53B30 Lorentz metrics, indefinite metrics
53B35 Hermitian and Kählerian structures [See also 32Cxx]
53B40 Finsler spaces and generalizations (areal metrics)
53B50 Applications to physics
53B99 None of the above, but in this section
53Cxx Global differential geometry [See also 51H25, 58–XX; for related bundle theory, see 55Rxx, 57Rxx]
53C05 Connections, general theory
53C07 Special connections and metrics on vector bundles (Hermite-Einstein-Yang-Mills) [See also 32L07]
53C10 G-structures
53C12 Foliations (differential geometric aspects) [See also 57R30, 57R32]
53C15 General geometric structures on manifolds (almost complex, contact, symplectic, almost product structures, etc.)
53C20 Global Riemannian geometry, including pinching [See also 31C12, 58B20]
53C21 Methods of Riemannian geometry, including PDE methods; curvature restrictions [See also 58G30]
53C22 Geodesics [See also 58E10]
53C23 Global topological methods (à la Gromov)
53C25 Special Riemannian manifolds (Einstein, Sasakian, etc.)
53C30 Homogeneous manifolds [See also 14M15, 14M17, 32M10, 57T15]
53C35 Symmetric spaces [See also 32M15, 57T15]
53C40 Global submanifolds [See also 53B25]
53C42 Immersions (minimal, prescribed curvature, tight, etc.) [See also 49Q05, 49Q10, 53A10, 57R40, 57R42]
53C45 Global surface theory (convex surfaces à la A. D. Aleksandrov)
53C50 Lorentz manifolds, manifolds with indefinite metrics
53C55 Hermitian and Kählerian manifolds [See also 32Cxx]
53C56 Other complex differential geometry [See also 32Cxx]
53C60 Finsler spaces and generalizations (areal metrics) [See also 58B20]
53C65 Integral geometry [See also 52A22, 60D05]; differential forms, currents, etc. [See mainly 58Axx]
53C70 Direct methods (G-spaces of Busemann, etc.)
53C75 Geometric orders, order geometry [See also 51Lxx]
53C80 Applications to physics
53C99 None of the above, but in this section
53Z05 Applications to physics

54–XX GENERAL TOPOLOGY {For the topology of manifolds of all dimensions, see 57Nxx}
54–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
54–01 Instructional exposition (textbooks, tutorial papers, etc.)
54–02 Research exposition (monographs, survey articles)
54–03 Historical (must also be assigned at least one classification number from Section 01)
54–04 Explicit machine computation and programs (not the theory of computation or programming)
54–06 Proceedings, conferences, collections, etc.
54Axx Generalities
54A05 Topological spaces and generalizations (closure spaces, etc.)
54A10 Several topologies on one set (change of topology, comparison of topologies, lattices of topologies)
54A15 Syntopogeneous structures
54A20 Convergence in general topology (sequences, filters, limits, convergence spaces, etc.)
54A25 Cardinality properties (cardinal functions and inequalities, discrete subsets) [See also 03Exx, 04A30] {For ultrafilters, see 54D80}
54A35 Consistency and independence results [See also 03E35]
54A40 Fuzzy topology [See also 04A72]
54A99 None of the above, but in this section
54Bxx Basic constructions
54B05 Subspaces
54B10 Product spaces
54B15 Quotient spaces, decompositions
54B17 Adjunction spaces and similar constructions
54B20 Hyperspaces
54B30 Categorical methods [See also 18B30]
54B35 Spectra
54B40 Presheaves and sheaves [See also 18F20]
54B99 None of the above, but in this section
54Cxx Maps and general types of spaces defined by maps
54C05 Continuous maps
54C08 Weak and generalized continuity
54C10 Special maps on topological spaces (open, closed, perfect, etc.)

54C15 Retraction
54C20 Extension of maps
54C25 Embedding
54C30 Real-valued functions [See also 26–XX]
54C35 Function spaces [See also 46Exx, 58D15]
54C40 Algebraic properties of function spaces [See also 46J10]
54C45 C- and C^*-embedding
54C50 Special sets defined by functions [See also 26A21]
54C55 Absolute neighborhood extensor, absolute extensor, absolute neighborhood retract (ANR), absolute retract spaces (general properties) [See also 55M15]
54C56 Shape theory [See also 55P55, 57N25]
54C60 Set-valued maps [See also 26E25, 28B20, 47H04, 58C06]
54C65 Selections [See also 28B20]
54C70 Entropy
54C99 None of the above, but in this section
54Dxx Fairly general properties
54D05 Connected and locally connected spaces (general aspects)
54D10 Lower separation axioms, (T_0–T_3, etc.)
54D15 Higher separation axioms (completely regular, normal, perfectly or collectionwise normal, etc.)
54D20 Noncompact covering properties (paracompact, Lindelöf, etc.)
54D25 "P-minimal" and "P-closed" spaces
54D30 Compactness
54D35 Extensions of spaces (compactifications, supercompactifications, completions, etc.)
54D40 Remainders
54D45 Local compactness, σ-compactness
54D50 k-spaces
54D55 Sequential spaces
54D60 Realcompactness and realcompactification
54D65 Separability
54D70 Base properties
54D80 Special constructions of spaces (spaces of ultrafilters, etc.)
54D99 None of the above, but in this section
54Exx Spaces with richer structures
54E05 Proximity structures and generalizations
54E15 Uniform structures and generalizations
54E17 Nearness spaces
54E18 p-spaces, M-spaces, σ-spaces, etc.
54E20 Stratifiable spaces, cosmic spaces, etc.
54E25 Semimetric spaces
54E30 Moore spaces
54E35 Metric spaces, metrizability
54E40 Special maps on metric spaces
54E45 Compact (locally compact) metric spaces
54E50 Complete metric spaces
54E52 Baire category, Baire spaces
54E55 Bitopologies
54E70 Probabilistic metric spaces
54E99 None of the above, but in this section
54Fxx Special properties
54F05 Ordered topological spaces, partially ordered spaces [See also 06B30, 06F30]
54F15 Continua and generalizations
54F35 Higher-dimensional local connectedness [See also 55Mxx, 55Nxx]
54F45 Dimension theory [See also 55M10]
54F50 Spaces of dimension ≤ 1; curves, dendrites [See also 26A03]
54F55 Unicoherence, multicoherence
54F65 Topological characterizations of particular spaces
54F99 None of the above, but in this section
54Gxx Peculiar spaces
54G05 Extremally disconnected spaces, F-spaces, etc.
54G10 P-spaces
54G12 Scattered spaces
54G15 Pathological spaces
54G20 Counterexamples
54G99 None of the above, but in this section
54Hxx Connections with other structures, applications
54H05 Descriptive set theory (topological aspects of Borel, analytic, projective, etc. sets) [See also 03E15, 04A15, 26A21, 28A05]
54H10 Topological representations of algebraic systems [See also 22–XX]
54H11 Topological groups [See also 22A05]
54H12 Topological lattices, etc. [See also 06B30, 06F30]
54H13 Topological fields, rings, etc. [See also 12Jxx] {For algebraic aspects, see 13Jxx, 16W80}
54H15 Transformation groups and semigroups [See also 20M20, 22–XX, 57Sxx]
54H20 Topological dynamics [See also 28Dxx, 34C35, 58Fxx]
54H25 Fixed-point and coincidence theorems [See also 47H10, 55M20]
54H99 None of the above, but in this section
54J05 Nonstandard topology [See also 03H05]

55–XX ALGEBRAIC TOPOLOGY
55–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
55–01 Instructional exposition (textbooks, tutorial papers, etc.)
55–02 Research exposition (monographs, survey articles)
55–03 Historical (must also be assigned at least one classification number from Section 01)
55–04 Explicit machine computation and programs (not the theory of computation or programming)
55–06 Proceedings, conferences, collections, etc.
55Mxx Classical topics {For the topology of Euclidean spaces and manifolds, see 57Nxx}
55M05 Duality
55M10 Dimension theory [See also 54F45]
55M15 Absolute neighborhood retracts [See also 54C55]
55M20 Fixed points and coincidences [See also 54H25]
55M25 Degree, winding number
55M30 Ljusternik-Schnirelman (Lyusternik-Shnirel′man) category of a space
55M35 Finite groups of transformations (including Smith theory) [See also 57S17]
55M99 None of the above, but in this section
55Nxx Homology and cohomology theories [See also 57Txx]
55N05 Čech types
55N07 Steenrod-Sitnikov homologies
55N10 Singular theory
55N15 K-theory [See also 19Lxx] {For algebraic K-theory, see 18F25, 19–XX}
55N20 Generalized (extraordinary) homology and cohomology theories
55N22 Bordism and cobordism theories, formal group laws [See also 14L05, 19L41, 57R75, 57R77, 57R85, 57R90]
55N25 Homology with local coefficients, equivariant cohomology
55N30 Sheaf cohomology [See also 18F20, 32C35, 32L10]
55N33 Intersection homology and cohomology
55N35 Other homology theories
55N40 Axioms for homology theory and uniqueness theorems
55N45 Products and intersections
55N91 Equivariant homology and cohomology [See also 19L47]
55N99 None of the above, but in this section
55Pxx Homotopy theory {For simple homotopy type, see 57Q10}
55P05 Homotopy extension properties, cofibrations
55P10 Homotopy equivalences
55P15 Classification of homotopy type
55P20 Eilenberg-Mac Lane spaces
55P25 Spanier-Whitehead duality
55P30 Eckmann-Hilton duality
55P35 Loop spaces
55P40 Suspensions
55P42 Stable homotopy theory, spectra
55P45 H-spaces and duals
55P47 Infinite loop spaces
55P50 Category and cocategory, etc.
55P55 Shape theory [See also 54C56, 55Q07]
55P60 Localization and completion
55P62 Rational homotopy theory
55P65 Homotopy functors
55P91 Equivariant homotopy theory [See also 19L47]
55P99 None of the above, but in this section
55Qxx Homotopy groups
55Q05 Homotopy groups, general; sets of homotopy classes
55Q07 Shape groups
55Q10 Stable homotopy groups
55Q15 Whitehead products and generalizations
55Q20 Homotopy groups of wedges, joins, and simple spaces
55Q25 Hopf invariants
55Q30 Homotopy groups of triads, n-ads
55Q35 Operations in homotopy groups
55Q40 Homotopy groups of spheres
55Q45 Stable homotopy of spheres
55Q50 J-morphism [See also 19L20]
55Q52 Homotopy groups of special spaces
55Q55 Cohomotopy groups
55Q70 Homotopy groups of special types [See also 55N05, 55N07]
55Q91 Equivariant homotopy groups [See also 19L47]
55Q99 None of the above, but in this section
55Rxx Fiber spaces and bundles [See also 18F15, 32Lxx, 46M20, 57R20, 57R22, 57R25]
55R05 Fiber spaces
55R10 Fiber bundles
55R12 Transfer
55R15 Classification
55R20 Spectral sequences and homology of fiber spaces [See also 55Txx]
55R25 Sphere bundles and vector space bundles
55R35 Classifying spaces of groups and H-spaces

55R40 Homology of classifying spaces, characteristic classes [See also 57Txx, 57R20]
55R45 Homology and homotopy of BO and BU; Bott periodicity
55R50 Stable classes of vector space bundles, K-theory [See also 19Lxx] {For algebraic K-theory, see 18F25, 19–XX}
55R55 Fiberings with singularities
55R60 Microbundles and block bundles [See also 57N55, 57Q50]
55R65 Generalizations of fiber spaces and bundles
55R91 Equivariant fiber spaces and bundles [See also 19L47]
55R99 None of the above, but in this section
55Sxx Operations and obstructions
55S05 Primary cohomology operations
55S10 Steenrod algebra
55S12 Dyer-Lashof operations
55S15 Symmetric products, cyclic products
55S20 Secondary and higher cohomology operations
55S25 K-theory operations and generalized cohomology operations [See also 19D55, 19Lxx]
55S30 Massey products
55S35 Obstruction theory
55S36 Extension and compression of mappings
55S37 Classification of mappings
55S40 Sectioning fiber spaces and bundles
55S45 Postnikov systems, k-invariants
55S91 Equivariant operations and obstructions [See also 19L47]
55S99 None of the above, but in this section
55Txx Spectral sequences [See also 18G40, 55R20]
55T05 General
55T10 Serre spectral sequences
55T15 Adams spectral sequences
55T20 Eilenberg-Moore spectral sequences [See also 57T35]
55T25 Generalized cohomology
55T99 None of the above, but in this section
55Uxx Applied homological algebra and category theory [See also 18Gxx]
55U05 Abstract complexes
55U10 Semisimplicial complexes
55U15 Chain complexes
55U20 Universal coefficient theorems, Bockstein operator
55U25 Homology of a product, Künneth formula
55U30 Duality
55U35 Abstract homotopy theory
55U40 Topological categories
55U99 None of the above, but in this section

57–XX MANIFOLDS AND CELL COMPLEXES {For complex manifolds, see 32C10}
57–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
57–01 Instructional exposition (textbooks, tutorial papers, etc.)
57–02 Research exposition (monographs, survey articles)
57–03 Historical (must also be assigned at least one classification number from Section 01)
57–04 Explicit machine computation and programs (not the theory of computation or programming)
57–06 Proceedings, conferences, collections, etc.
57Mxx Low-dimensional topology
57M05 Fundamental group, presentations, free differential calculus
57M07 Topological methods in group theory
57M10 Covering spaces
57M12 Special coverings, e.g. branched
57M15 Relations with graph theory [See also 05Cxx]
57M20 Two-dimensional complexes
57M25 Knots and links in S^3 {For higher dimensions, see 57Q45}
57M30 Wild knots and surfaces, etc.; wild embeddings
57M35 Dehn's lemma, sphere theorem, loop theorem, asphericity
57M40 Characterizations of E^3 and S^3 (Poincaré conjecture) [See also 57N12]
57M50 Geometric structures on low-dimensional manifolds
57M60 Group actions in low dimensions
57M99 None of the above, but in this section
57Nxx Topological manifolds
57N05 Topology of E^2, 2-manifolds
57N10 Topology of general 3-manifolds [See also 57Mxx]
57N12 Topology of E^3 and S^3 [See also 57M40]
57N13 Topology of E^4, 4-manifolds [See also 14Jxx, 32Jxx]
57N15 Topology of E^n, n-manifolds $(4 < n < \infty)$
57N17 Topology of topological vector spaces
57N20 Topology of infinite-dimensional manifolds [See also 58Bxx]
57N25 Shapes [See also 54C56, 55P55, 55Q07]
57N30 Engulfing
57N35 Embeddings and immersions
57N37 Isotopy and pseudo-isotopy
57N40 Neighborhoods of submanifolds
57N45 Flatness and tameness
57N50 $S^{n-1} \subset E^n$, Schoenflies problem
57N55 Microbundles and block bundles [See also 55R60, 57Q50]
57N60 Cellularity
57N65 Algebraic topology of manifolds
57N70 Cobordism and concordance
57N75 General position and transversality
57N80 Stratifications
57N99 None of the above, but in this section
57Pxx Generalized manifolds [See also 18F15]
57P05 Local properties of generalized manifolds
57P10 Poincaré duality spaces
57P99 None of the above, but in this section
57Qxx PL-topology
57Q05 General topology of complexes
57Q10 Simple homotopy type, Whitehead torsion, Reidemeister-Franz torsion, etc. [See also 19B28]
57Q12 Wall finiteness obstruction for CW-complexes
57Q15 Triangulating manifolds
57Q20 Cobordism
57Q25 Comparison of PL-structures: classification, Hauptvermutung
57Q30 Engulfing
57Q35 Embeddings and immersions
57Q37 Isotopy
57Q40 Regular neighborhoods
57Q45 Knots and links (in high dimensions) {For the low-dimensional case, see 57M25}
57Q50 Microbundles and block bundles [See also 55R60, 57N55]
57Q55 Approximations
57Q60 Cobordism and concordance
57Q65 General position and transversality
57Q91 Equivariant PL-topology
57Q99 None of the above, but in this section
57Rxx Differential topology {For foundational questions of differentiable manifolds, see 58Axx; for infinite-dimensional manifolds, see 58Bxx}
57R05 Triangulating
57R10 Smoothing
57R12 Smooth approximations
57R15 Specialized structures on manifolds (spin manifolds, framed manifolds, etc.)
57R19 Algebraic topology on manifolds
57R20 Characteristic classes and numbers
57R22 Topology of vector bundles and fiber bundles [See also 55Rxx]
57R25 Vector fields, frame fields
57R27 Controllability of vector fields on C^∞ and real-analytic manifolds [See also 49Qxx, 58F40, 93B05]
57R30 Foliations; geometric theory
57R32 Classifying spaces for foliations; Gel′fand-Fuks cohomology [See also 58H10]
57R35 Differentiable mappings
57R40 Embeddings
57R42 Immersions
57R45 Singularities of differentiable mappings
57R50 Diffeomorphisms
57R52 Isotopy
57R55 Differentiable structures
57R57 Applications of global analysis to structures on manifolds [See also 58–XX]
57R60 Homotopy spheres, Poincaré conjecture
57R65 Surgery and handlebodies
57R67 Surgery obstructions, Wall groups [See also 19J25]
57R70 Critical points and critical submanifolds
57R75 O- and SO-cobordism
57R77 Complex cobordism (U- and SU-cobordism) [See also 55N22]
57R80 h- and s-cobordism
57R85 Equivariant cobordism
57R90 Other types of cobordism [See also 55N22]
57R91 Equivariant algebraic topology of manifolds
57R95 Realizing cycles by submanifolds
57R99 None of the above, but in this section
57Sxx Topological transformation groups [See also 20F34, 22–XX, 54H15, 58D05]
57S05 Topological properties of groups of homeomorphisms or diffeomorphisms
57S10 Compact groups of homeomorphisms
57S15 Compact Lie groups of differentiable transformations
57S17 Finite transformation groups
57S20 Noncompact Lie groups of transformations
57S25 Groups acting on specific manifolds
57S30 Discontinuous groups of transformations
57S99 None of the above, but in this section

57Txx Homology and homotopy of topological groups and related structures
57T05 Hopf algebras [See also 16W30]
57T10 Homology and cohomology of Lie groups
57T15 Homology and cohomology of homogeneous spaces of Lie groups
57T20 Homotopy groups of topological groups and homogeneous spaces
57T25 Homology and cohomology of H-spaces
57T30 Bar and cobar constructions [See also 18G55, 55Uxx]
57T35 Applications of Eilenberg-Moore spectral sequences [See also 55R20, 55T20]
57T99 None of the above, but in this section

58–XX GLOBAL ANALYSIS, ANALYSIS ON MANIFOLDS [See also 32Cxx, 32Fxx, 46–XX, 47Hxx, 53Cxx; for geometric integration theory, see 49Q15]
58–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
58–01 Instructional exposition (textbooks, tutorial papers, etc.)
58–02 Research exposition (monographs, survey articles)
58–03 Historical (must also be assigned at least one classification number from Section 01)
58–04 Explicit machine computation and programs (not the theory of computation or programming)
58–06 Proceedings, conferences, collections, etc.
58Axx General theory of differentiable manifolds
58A03 Topos-theoretic approach to differentiable manifolds
58A05 Differentiable manifolds, foundations
58A07 Real-analytic and Nash manifolds [See also 14P20, 32C07]
58A10 Differential forms
58A12 de Rham theory [See also 14Fxx]
58A14 Hodge theory [See also 14C30, 14Fxx, 32J25, 32S35]
58A15 Exterior differential systems (Cartan theory)
58A17 Pfaffian systems
58A20 Jets
58A25 Currents [See also 32C30, 53C65]
58A30 Vector distributions (subbundles of the tangent bundles)
58A35 Stratified sets [See also 32S60, 58C27]
58A40 Differential spaces
58A50 Supermanifolds and graded manifolds [See also 14A22, 32C11]
58A99 None of the above, but in this section
58Bxx Infinite-dimensional manifolds
58B05 Homotopy and topological questions
58B10 Differentiability questions
58B12 Questions of holomorphy [See also 32–XX, 46G20]
58B15 Fredholm structures [See also 47A53]
58B20 Riemannian, Finsler and other geometric structures [See also 53C20, 53C60]
58B25 Group structures and generalizations on infinite-dimensional manifolds [See also 22E65, 58D05]
58B30 Noncommutative differential geometry and topology [See also 46L30, 46L87, 46L89]
58B99 None of the above, but in this section
58Cxx Calculus on manifolds; nonlinear operators [See also 47Hxx]
58C05 Real-valued functions
58C06 Set valued and function-space valued mappings [See also 47H04, 54C60]
58C07 Continuity properties of mappings
58C10 Holomorphic maps [See also 32–XX]
58C15 Implicit function theorems; global Newton methods
58C20 Differentiation theory (Gateaux, Fréchet, etc.) [See also 26Exx, 46G05]
58C25 Differentiable maps
58C27 Singularities of differentiable maps [See also 14B05, 14E15, 32Sxx]
58C28 Catastrophes [See also 57R70, 58Exx]
58C30 Fixed-point theorems on manifolds [See also 47H10]
58C35 Integration on manifolds; measures on manifolds [See also 28Cxx]
58C40 Spectral theory; eigenvalue problems [See also 47H12, 58E07]
58C50 Analysis on supermanifolds or graded manifolds
58C99 None of the above, but in this section
58Dxx Spaces and manifolds of mappings (including nonlinear versions of 46Exx)
58D05 Groups of diffeomorphisms and homeomorphisms as manifolds [See also 22E65, 57S05]
58D07 Groups and semigroups of nonlinear operators [See also 17B65, 47D03, 47D06, 47H20]
58D10 Spaces of embeddings and immersions
58D15 Manifolds of mappings [See also 54C35]
58D17 Manifolds of metrics (esp. Riemannian)
58D19 Group actions and symmetry properties
58D20 Measures (Gaussian, cylindrical, etc.) on manifolds of maps [See also 28Cxx]
58D25 Equations in function spaces; evolution equations [See also 34Gxx, 35K22, 35R15, 47H15]
58D27 Moduli problems for differential geometric structures
58D29 Moduli problems for topological structures
58D30 Applications (in quantum mechanics (Feynman path integrals), relativity, fluid dynamics, etc.)
58D99 None of the above, but in this section
58Exx Variational problems in infinite-dimensional spaces
58E05 Abstract critical point theory (Morse theory, Ljusternik-Schnirelman (Lyusternik-Shnirel′man) theory, etc.)
58E07 Abstract bifurcation theory
58E09 Group-invariant bifurcation theory
58E10 Applications to the theory of geodesics (problems in one independent variable)
58E11 Critical metrics
58E12 Applications to minimal surfaces (problems in two independent variables)
58E15 Application to extremal problems in several variables; Yang-Mills functionals [See also 81T13], etc.
58E17 Pareto optimality, etc., applications to economics
58E20 Harmonic maps
58E25 Applications to control theory (optimal and nonoptimal)
58E30 Variational principles
58E35 Variational inequalities (global problems)
58E40 Group actions
58E50 Applications
58E99 None of the above, but in this section
58Fxx Ordinary differential equations on manifolds; dynamical systems [See also 28D10, 34Cxx, 54H20]
58F03 One-dimensional dynamics, general symbolic dynamics [See also 26A18]
58F05 Hamiltonian and Lagrangian systems; symplectic geometry [See also 70Hxx, 81S10]
58F06 Geometric quantization (applications of representation theory) [See also 22E45, 81S10]
58F07 Completely integrable systems (including systems with an infinite number of degrees of freedom)
58F08 Point-mapping properties, iterations, completeness; dynamics of cellular automata [See also 26A18, 30D05]
58F09 Morse-Smale systems
58F10 Stability theory
58F11 Ergodic theory; invariant measures [See also 28Dxx]
58F12 Structure of attractors (and repellors)
58F13 Strange attractors; chaos and other pathologies [See also 70K50]
58F14 Bifurcation theory and singularities
58F15 Hyperbolic structures (expanding maps, Anosov systems, etc.)
58F17 Geodesic and horocycle flows
58F18 Relations with foliations
58F19 Eigenvalue and spectral problems
58F20 Periodic points and zeta functions
58F21 Limit cycles, singular points, etc.
58F22 Periodic solutions
58F23 Holomorphic dynamics [See also 30D05]
58F25 Flows
58F27 Quasiperiodic flows
58F30 Perturbations
58F32 Functional-differential equations on manifolds
58F35 Invariance properties
58F36 Normal forms
58F37 Correspondences and other transformation methods (e.g. Lie-Bäcklund)
58F39 Dynamical systems treatment of PDE (should be assigned another number from 58F) [See also 35B32, 35K57]
58F40 Applications
58F99 None of the above, but in this section
58Gxx Partial differential equations on manifolds; differential operators [See also 35–XX]
58G03 Elliptic equations on manifolds, general theory
58G05 Differential complexes [See also 35Nxx]; elliptic complexes
58G07 Relations with hyperfunctions
58G10 Index theory and related fixed-point theorems [See also 19K56, 46L80]
58G11 Heat and other parabolic equation methods
58G12 Exotic index theories [See also 19K56, 46L05, 46L10, 46L80, 46M20]
58G15 Pseudodifferential and Fourier integral operators on manifolds [See also 35Sxx]
58G16 Hyperbolic equations
58G17 Propagation of singularities; initial value problems
58G18 Perturbations; asymptotics
58G20 Boundary value problems on manifolds
58G25 Spectral problems; spectral geometry; scattering theory [See also 35Pxx]
58G26 Determinants and determinant bundles
58G28 Bifurcations [See also 35B32]
58G30 Relations with special manifold structures (Riemannian, Finsler, etc.)
58G32 Diffusion processes and stochastic analysis on manifolds

58G35 Invariance and symmetry properties [See also 35A30]
58G37 Correspondences and other transformation methods (e.g. Lie-Bäcklund) [See also 35A22]
58G40 Applications
58G99 None of the above, but in this section
58Hxx Pseudogroups, differentiable groupoids and general structures on manifolds
58H05 Pseudogroups and differentiable groupoids [See also 22A22, 22E65]
58H10 Cohomology of classifying spaces for pseudogroup structures (Spencer, Gel′fand-Fuks, etc.) [See also 57R32]
58H15 Deformations of structures [See also 32Gxx, 58G05]
58H99 None of the above, but in this section
58Z05 Applications to physics

60–XX PROBABILITY THEORY AND STOCHASTIC PROCESSES {For additional applications, see 11Kxx, 62–XX, 90–XX, 92–XX, 93–XX, 94–XX. For numerical results, see 65U05}
60–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
60–01 Instructional exposition (textbooks, tutorial papers, etc.)
60–02 Research exposition (monographs, survey articles)
60–03 Historical (must also be assigned at least one classification number from Section 01)
60–04 Explicit machine computation and programs (not the theory of computation or programming)
60–06 Proceedings, conferences, collections, etc.
60Axx Foundations of probability theory
60A05 Axioms; other general questions [See also 03B48]
60A10 Probabilistic measure theory {For ergodic theory, see 28Dxx and 60Fxx}
60A99 None of the above, but in this section
60Bxx Probability theory on algebraic and topological structures
60B05 Probability measures on topological spaces
60B10 Convergence of probability measures
60B11 Probability theory on linear topological spaces [See also 28C20]
60B12 Limit theorems for vector-valued random variables (infinite-dimensional case)
60B15 Probability measures on groups, Fourier transforms, factorization
60B99 None of the above, but in this section
60C05 Combinatorial probability
60D05 Geometric probability, stochastic geometry, random sets [See also 52A22, 53C65]
60Exx Distribution theory [See also 62Exx, 62Hxx]
60E05 Distributions: general theory
60E07 Infinitely divisible distributions; stable distributions
60E10 Characteristic functions; other transforms
60E15 Inequalities (Chebyshev, Kolmogorov, etc.)
60E99 None of the above, but in this section
60Fxx Limit theorems [See also 28Dxx, 60B12]
60F05 Central limit and other weak theorems
60F10 Large deviations
60F15 Strong theorems
60F17 Functional limit theorems; invariance principles
60F20 Zero-one laws
60F25 L^p-limit theorems
60F99 None of the above, but in this section
60Gxx Stochastic processes
60G05 Foundations of stochastic processes
60G07 General theory of processes
60G09 Exchangeability
60G10 Stationary processes
60G12 General second-order processes
60G15 Gaussian processes
60G17 Sample path properties
60G18 Self-similar processes
60G20 Generalized stochastic processes
60G25 Prediction theory [See also 62M20]
60G30 Continuity and singularity of induced measures
60G35 Applications (signal detection, filtering, etc.) [See also 62M20, 93E10, 93E11, 94Axx]
60G40 Stopping times; optimal stopping problems; gambling theory [See also 62L15, 90D60]
60G42 Martingales with discrete parameter
60G44 Martingales with continuous parameter
60G46 Martingales and classical analysis
60G48 Generalizations of martingales
60G50 Sums of independent random variables
60G55 Point processes
60G57 Random measures
60G60 Random fields
60G70 Extreme value theory; extremal processes
60G99 None of the above, but in this section
60Hxx Stochastic analysis [See also 58G32]
60H05 Stochastic integrals
60H07 Stochastic calculus of variations and the Malliavin calculus
60H10 Stochastic ordinary differential equations [See also 34F05]
60H15 Stochastic partial differential equations [See also 35R60]
60H20 Stochastic integral equations
60H25 Random operators and equations [See also 47B80]
60H30 Applications of stochastic analysis (to PDE, etc.)
60H99 None of the above, but in this section
60Jxx Markov processes
60J05 Markov processes with discrete parameter
60J10 Markov chains with discrete parameter
60J15 Random walks
60J20 Applications of discrete Markov processes (social mobility, learning theory, industrial processes, etc.) [See also 90B30, 92H10, 92H35, 92J40]
60J25 Markov processes with continuous parameter
60J27 Markov chains with continuous parameter
60J30 Processes with independent increments
60J35 Transition functions, generators and resolvents [See also 47D03, 47D07]
60J40 Right processes
60J45 Probabilistic potential theory [See also 31Cxx, 31D05]
60J50 Boundary theory
60J55 Local time and additive functionals
60J57 Multiplicative functionals
60J60 Diffusion processes [See also 58G32]
60J65 Brownian motion [See also 58G32]
60J70 Applications of diffusion theory (population genetics, absorption problems, etc.) [See also 92Dxx]
60J75 Jump processes
60J80 Branching processes (Galton-Watson, birth-and-death, etc.)
60J85 Applications of branching processes [See also 92Dxx]
60J99 None of the above, but in this section
60Kxx Special processes
60K05 Renewal theory
60K10 Applications (reliability, demand theory, etc.)
60K15 Markov renewal processes, semi-Markov processes
60K20 Applications of Markov renewal processes (reliability, queueing networks, etc.) [See also 90Bxx]
60K25 Queueing theory [See also 68M20, 90B22]
60K30 Applications (congestion, allocation, storage, traffic, etc.) [See also 90Bxx]
60K35 Interacting random processes; statistical mechanics type models; percolation theory [See also 82B43, 82C43]
60K40 Other physical applications of random processes
60K99 None of the above, but in this section

62–XX STATISTICS {For numerical methods, see 65U05}
62–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
62–01 Instructional exposition (textbooks, tutorial papers, etc.)
62–02 Research exposition (monographs, survey articles)
62–03 Historical (must also be assigned at least one classification number from Section 01)
62–04 Explicit machine computation and programs (not the theory of computation or programming)
62–06 Proceedings, conferences, collections, etc.
62–07 Data analysis
62–09 Graphical methods
62Axx Foundations
62A05 Invariance and group considerations
62A10 The likelihood approach
62A15 The Bayesian approach
62A20 The classical approach
62A25 The structural approach
62A30 The fiducial approach
62A99 None of the above, but in this section
62Bxx Sufficiency and information
62B05 Sufficient statistics and fields
62B10 Statistical information theory [See also 94A17]
62B15 Theory of statistical experiments
62B20 Measure-theoretic results, etc.
62B99 None of the above, but in this section
62Cxx Decision theory [See also 90A05, 90B50; for game theory, see 90D35]
62C05 General considerations
62C07 Complete class results
62C10 Bayesian problems; characterization of Bayes procedures
62C12 Empirical decision procedures; empirical Bayes procedures
62C15 Admissibility
62C20 Minimax procedures
62C25 Compound decision problems
62C99 None of the above, but in this section

62D05 Sampling theory, sample surveys
62Exx Distribution theory [See also 60Exx]
62E10 Characterization and structure theory
62E15 Exact distribution theory
62E17 Approximations to distributions (nonasymptotic)
62E20 Asymptotic distribution theory
62E25 Monte Carlo studies
62E30 Formal computational methods (polykays, etc.)
62E99 None of the above, but in this section
62Fxx Parametric inference
62F03 Hypothesis testing
62F04 Small-sample properties of tests
62F05 Asymptotic properties of tests
62F07 Ranking and selection
62F10 Point estimation
62F11 Small-sample properties of estimators
62F12 Asymptotic properties of estimators
62F15 Bayesian inference
62F25 Tolerance and confidence regions
62F30 Inference under constraints
62F35 Robustness and adaptive procedures
62F99 None of the above, but in this section
62Gxx Nonparametric inference
62G05 Estimation
62G07 Curve estimation (nonparametric regression, density estimation, etc.)
62G09 Resampling methods
62G10 Hypothesis testing
62G15 Tolerance and confidence regions
62G20 Asymptotic properties
62G30 Order statistics; empirical distribution functions
62G35 Robustness
62G99 None of the above, but in this section
62Hxx Multivariate analysis [See also 60Exx]
62H05 Characterization and structure theory
62H10 Distribution of statistics
62H11 Directional data; spatial statistics
62H12 Estimation
62H15 Hypothesis testing
62H17 Contingency
62H20 Measures of association (correlation, canonical correlation, etc.)
62H25 Factor analysis and principal components; correspondence analysis
62H30 Classification and discrimination; cluster analysis [See also 68T10]
62H40 Projection pursuit
62H99 None of the above, but in this section
62Jxx Linear inference, regression
62J02 General nonlinear regression
62J05 Linear regression
62J07 Ridge regression; James-Stein estimators
62J10 Analysis of variance and covariance
62J12 Generalized linear models
62J15 Paired and multiple comparisons
62J20 Diagnostics
62J99 None of the above, but in this section
62Kxx Experimental design [See also 05Bxx]
62K05 Optimal designs
62K10 Block designs
62K15 Factorial designs
62K99 None of the above, but in this section
62Lxx Sequential methods
62L05 Sequential design
62L10 Sequential analysis
62L12 Sequential estimation
62L15 Optimal stopping [See also 60G40, 90D60]
62L20 Stochastic approximation
62L99 None of the above, but in this section
62Mxx Inference from stochastic processes
62M02 Markov processes: hypothesis testing
62M05 Markov processes: estimation
62M07 Non-Markovian processes: hypothesis testing
62M09 Non-Markovian processes: estimation
62M10 Time series, auto-correlation, regression, etc. [See also 90A20]
62M15 Spectral analysis
62M20 Prediction [See also 60G25]; filtering [See also 60G35, 93E10, 93E11]
62M30 Spatial processes
62M40 Random fields
62M99 None of the above, but in this section
62Nxx Engineering statistics
62N05 Reliability and life testing [See also 90B25]
62N10 Quality control
62N99 None of the above, but in this section
62Pxx Applications [See also 90–XX, 92–XX]
62P05 Applications to actuarial sciences and financial mathematics
62P10 Applications to biology
62P15 Applications to psychology
62P20 Applications to economics [See also 90Axx]
62P25 Applications to social sciences
62P99 None of the above, but in this section
62Q05 Statistical tables

65–XX NUMERICAL ANALYSIS
65–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
65–01 Instructional exposition (textbooks, tutorial papers, etc.)
65–02 Research exposition (monographs, survey articles)
65–03 Historical (must also be assigned at least one classification number from Section 01)
65–04 Explicit machine computation and programs (not the theory of computation or programming)
65–05 Experimental papers
65–06 Proceedings, conferences, collections, etc.
65A05 Tables
65Bxx Acceleration of convergence
65B05 Extrapolation to the limit, deferred corrections
65B10 Summation of series
65B15 Euler-Maclaurin formula
65B99 None of the above, but in this section
65Cxx Numerical simulation {For theoretical aspects, see 68U20}
65C05 Monte Carlo methods
65C10 Random number generation
65C20 Models, numerical methods
65C99 None of the above, but in this section
65Dxx Numerical approximation {Primarily algorithms; for theory, see 41–XX}
65D05 Interpolation
65D07 Splines
65D10 Smoothing, curve fitting
65D15 Algorithms for functional approximation
65D17 Computer-aided design (modeling of curves and surfaces) [See also 68U05]
65D20 Computation of special functions, construction of tables
65D25 Numerical differentiation
65D30 Numerical integration
65D32 Quadrature and cubature formulas
65D99 None of the above, but in this section
65E05 Numerical methods in complex analysis (potential theory, etc.) {For numerical methods in conformal mapping, see 30C30}
65Fxx Numerical linear algebra
65F05 Direct methods for linear systems and matrix inversion
65F10 Iterative methods for linear systems [See also 65N22]
65F15 Eigenvalues, eigenvectors
65F20 Overdetermined systems, pseudoinverses
65F25 Orthogonalization
65F30 Other matrix algorithms
65F35 Matrix norms, conditioning, scaling [See also 15A12, 15A60]
65F40 Determinants
65F50 Sparse matrices
65F99 None of the above, but in this section
65Gxx Error analysis
65G05 Roundoff error
65G10 Interval and finite arithmetic
65G99 None of the above, but in this section
65Hxx Nonlinear algebraic or transcendental equations
65H05 Single equations
65H10 Systems of equations
65H17 Eigenvalues, eigenvectors and bifurcation problems [See also 58C40, 58E07, 58F14, 90C30]
65H20 Global methods, including homotopy approaches [See also 58C30, 90C30]
65H99 None of the above, but in this section
65Jxx Numerical analysis in abstract spaces
65J05 General theory
65J10 Equations with linear operators (do not use 65Fxx)
65J15 Equations with nonlinear operators (do not use 65Hxx)
65J20 Improperly posed problems
65J99 None of the above, but in this section
65Kxx Mathematical programming, optimization and variational techniques
65K05 Mathematical programming [See also 90Cxx]
65K10 Optimization and variational techniques [See also 49Mxx, 93B40]
65K99 None of the above, but in this section
65Lxx Ordinary differential equations
65L05 Initial value problems
65L06 Multistep, Runge-Kutta and extrapolation methods
65L07 Numerical investigation of stability of solutions

65L08 Improperly posed problems
65L10 Boundary value problems
65L12 Finite difference methods
65L15 Eigenvalue problems
65L20 Stability of numerical methods
65L50 Mesh generation and refinement
65L60 Finite elements, Rayleigh-Ritz, Galerkin and collocation methods
65L70 Error bounds
65L99 None of the above, but in this section
65Mxx Partial differential equations, initial value and time-dependent initial-boundary value problems
65M06 Finite difference methods
65M12 Stability and convergence of numerical methods
65M15 Error bounds
65M20 Method of lines
65M25 Method of characteristics
65M30 Improperly posed problems
65M50 Mesh generation and refinement
65M55 Multigrid methods; domain decomposition
65M60 Finite elements, Rayleigh-Ritz and Galerkin methods, finite methods
65M70 Spectral, collocation and related methods
65M99 None of the above, but in this section
65Nxx Partial differential equations, boundary value problems
65N06 Finite difference methods
65N12 Stability and convergence of numerical methods
65N15 Error bounds
65N22 Solution of discretized equations [See also 65Fxx, 65Hxx]
65N25 Eigenvalue problems
65N30 Finite elements, Rayleigh-Ritz and Galerkin methods, finite methods
65N35 Spectral, collocation and related methods
65N38 Boundary element methods
65N40 Method of lines
65N45 Method of contraction of the boundary
65N50 Mesh generation and refinement
65N55 Multigrid methods; domain decomposition
65N99 None of the above, but in this section
65P05 Partial differential equations, miscellaneous problems
65Q05 Difference and functional equations, recurrence relations
65Rxx Integral equations, integral transforms [See also 45Lxx]
65R10 Integral transforms
65R20 Integral equations
65R30 Improperly posed problems
65R99 None of the above, but in this section
65S05 Graphical methods
65Txx Numerical methods in Fourier analysis
65T10 Trigonometric approximation and interpolation
65T20 Discrete and fast Fourier transforms
65T99 None of the above, but in this section
65U05 Numerical methods in probability and statistics
65Yxx Computer aspects of numerical algorithms
65Y05 Parallel computation
65Y10 Algorithms for specific classes of architectures
65Y15 Packaged methods
65Y20 Complexity and performance of numerical algorithms [See also 68Q25]
65Y25 Computer graphics and computational geometry [See also 51N05, 68U05]
65Y99 None of the above, but in this section

68–XX COMPUTER SCIENCE {For papers involving machine computations and programs in a specific mathematical area, see Section –04 in that area}
68–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
68–01 Instructional exposition (textbooks, tutorial papers, etc.)
68–02 Research exposition (monographs, survey articles)
68–03 Historical (must also be assigned at least one classification number from Section 01)
68–04 Explicit machine computation and programs (not the theory of computation or programming)
68–06 Proceedings, conferences, collections, etc.
68Mxx Computer system organization
68M05 General
68M07 Mathematical problems of computer architecture
68M10 Computer networks [See also 90B12]
68M15 Reliability and testing
68M20 Performance evaluation; queueing; scheduling [See also 60K25, 90Bxx]
68M99 None of the above, but in this section
68Nxx Software
68N05 General theory of programming
68N15 Programming languages
68N17 Logic programming
68N20 Compilers and generators [See also 68Q52]
68N25 Monitors and operating systems
68N99 None of the above, but in this section
68Pxx Theory of data
68P05 Data structures
68P10 Searching and sorting
68P15 Database theory
68P20 Information storage and retrieval
68P25 Data encryption [See also 94A60]
68P99 None of the above, but in this section
68Qxx Theory of computing
68Q05 Models of computation (abstract processors, Turing machines, etc.) [See also 03D10]
68Q10 Modes of computation (concurrent, parallel, nondeterministic, etc.) [See also 68Q90]
68Q15 Complexity classes [See also 03D15]
68Q20 Nonnumerical algorithms {For numerical algorithms, see 65–XX; for combinatorics and graph theory, see 68Rxx}
68Q22 Parallel and distributed algorithms {For numerical algorithms, see 65Y05, 65Y10}
68Q25 Analysis of algorithms and problem complexity
68Q30 Algorithmic information theory (Kolmogorov complexity, etc.)
68Q35 VLSI algorithms
68Q40 Symbolic computation, algebraic computation [See also 11Yxx, 12Y05, 13Pxx, 14Qxx, 16–08, 17–08]
68Q42 Rewriting systems
68Q45 Formal languages [See also 03D05, 20M35, 94A45]
68Q50 Grammars [See also 03D05]
68Q52 Parsing [See also 68N20]
68Q55 Semantics [See also 03B70, 06B35]
68Q60 Specification and verification of programs [See also 03B70]
68Q65 Abstract data types; algebraic specification
68Q68 Automata theory, general [See also 03D05]
68Q70 Algebraic theory of automata [See also 18B20, 20M35]
68Q75 Stochastic and nondeterministic automata
68Q80 Tessellation automata, iterative arrays, cellular structures
68Q90 Transition nets
68Q99 None of the above, but in this section
68Rxx Discrete mathematics in relation to computer science
68R05 Combinatorics
68R10 Graph theory [See also 05Cxx, 90B10, 90B35, 90C35]
68R15 Combinatorics on words
68R99 None of the above, but in this section
68S05 Mathematical linguistics [See also 03B65, 92K20]
68Txx Artificial intelligence [See also 92J40]
68T01 General
68T05 Learning and adaptive systems
68T10 Pattern recognition, speech recognition {For cluster analysis, see 62H30}
68T15 Theorem proving [See also 03B35]
68T20 Problem solving
68T25 AI languages
68T27 AI logics
68T30 Knowledge representation
68T35 AI software systems (knowledge-based systems, expert systems, etc.)
68T99 None of the above, but in this section
68Uxx Computing methodologies
68U05 Computer graphics; computational geometry [See also 65Y25]
68U07 Computer-aided design
68U10 Image processing
68U15 Text processing; mathematical typography
68U20 Simulation [See also 65Cxx]
68U30 Other applications
68U99 None of the above, but in this section

70–XX MECHANICS OF PARTICLES AND SYSTEMS {For relativistic mechanics, see 83A05 and 83C10; for statistical mechanics, see 82–XX}
70–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
70–01 Instructional exposition (textbooks, tutorial papers, etc.)
70–02 Research exposition (monographs, survey articles)
70–03 Historical (must also be assigned at least one classification number from Section 01)
70–04 Explicit machine computation and programs (not the theory of computation or programming)
70–05 Experimental papers
70–06 Proceedings, conferences, collections, etc.
70–08 Computational methods
70A05 Axiomatics, foundations
70Bxx Kinematics [See also 53A17]
70B05 Kinematics of a particle
70B10 Kinematics of a rigid body
70B15 Mechanisms, robots [See also 73K05]
70B99 None of the above, but in this section

70C20 Statics
70Dxx Dynamics of a particle [See also 70Hxx]
70D05 Newtonian dynamics
70D10 Lagrangian dynamics
70D99 None of the above, but in this section
70Exx Dynamics of a rigid body
70E05 Motion of the gyroscope
70E10 Motion of projectiles and rockets
70E15 Motion of rigid bodies
70E20 Perturbation methods for Euler's equations
70E99 None of the above, but in this section
70Fxx Dynamics of a system of particles, including celestial mechanics
70F05 Two-body problem
70F07 Three-body problem
70F10 n-body problem
70F15 Celestial mechanics
70F20 Holonomic systems
70F25 Nonholonomic systems
70F30 Impulsive motion
70F35 Collisions
70F99 None of the above, but in this section
70Gxx General representations of dynamical systems [See also 58Fxx]
70G05 Riemannian geometry, tensorial methods [See also 53A45, 53A50, 53B20]
70G10 Generalized coordinates
70G15 Space of events
70G20 Impulse-energy space
70G25 Configuration space
70G30 State space
70G35 Phase space
70G50 Classical field theories (general)
70G99 None of the above, but in this section
70Hxx Hamiltonian and Lagrangian mechanics [See also 58F05]
70H05 Hamilton's equations
70H10 Liouville's theorem
70H15 Canonical transformations
70H20 Hamilton-Jacobi equations
70H25 Hamilton's principle
70H30 Other variational principles
70H33 Symmetries
70H35 Lagrange's equation of motion
70H40 Relativistic dynamics
70H99 None of the above, but in this section
70Jxx Linear vibration theory [See also 73D30]
70J05 Finite degree of freedom systems
70J10 Modal analysis
70J25 Stability
70J30 Free motions
70J35 Forced motions
70J40 Parametric resonances
70J99 None of the above, but in this section
70Kxx Nonlinear motions [See also 34Cxx, 58Fxx, 73D35, 73K12]
70K05 Phase plane analysis
70K10 Limit cycles
70K15 Lyapunov theorems
70K20 Stability
70K25 Free motions
70K28 Parametric resonances
70K30 Nonlinear resonances
70K40 Forced motions
70K50 Transition to stochasticity (chaotic behavior) [See also 58F13]
70K99 None of the above, but in this section
70L05 Random vibrations [See also 73K35, 93Exx]
70M20 Orbital mechanics
70P05 Variable mass, rockets
70Q05 Control of mechanical systems [See also 49–XX, 73K50, 93Cxx, 93Dxx]

73–XX MECHANICS OF SOLIDS
73–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
73–01 Instructional exposition (textbooks, tutorial papers, etc.)
73–02 Research exposition (monographs, survey articles)
73–03 Historical (must also be assigned at least one classification number from Section 01)
73–04 Explicit machine computation and programs (not the theory of computation or programming)
73–05 Experimental papers
73–06 Proceedings, conferences, collections, etc.
73A05 Axiomatics, foundations of solid mechanics
73Bxx Continuum mechanics of solids (constitutive description and properties)
73B05 Constitutive equations
73B10 Symmetry groups
73B18 Nonlocal theories
73B25 Polar theories
73B27 Nonhomogeneous materials; homogenization
73B30 Thermodynamics of solids {For gases and fluids, see 80–XX}
73B35 Random materials
73B40 Anisotropic materials
73B50 Stress concentrations
73B99 None of the above, but in this section
73Cxx Elasticity {For the biharmonic equation, see 31A30, 31B30}
73C02 Classical linear elasticity
73C05 Stress functions
73C10 Saint-Venant's principle
73C15 Uniqueness theorems
73C35 Mixed boundary value problems [See also 45F05]
73C50 Nonlinear elasticity
73C99 None of the above, but in this section
73Dxx Wave propagation in and vibrations of solids
73D05 Impact and explosion problems [See also 76L05]
73D10 Integral transforms
73D15 Body waves
73D20 Surface waves
73D25 Wave diffraction and dispersion
73D30 Linear vibrations [See also 70Jxx]
73D35 Nonlinear vibrations [See also 70Kxx]
73D40 Singular surfaces
73D50 Inverse problems [See also 35Lxx, 35R30]
73D70 Random waves
73D99 None of the above, but in this section
73Exx Plasticity
73E05 Constitutive specifications (yield criteria, flow rules, hardening, softening)
73E10 Method of successive approximations
73E20 Limit analysis
73E50 Time-dependent problems
73E60 Viscoplasticity
73E70 Plastic waves
73E99 None of the above, but in this section
73Fxx Viscoelasticity
73F05 Creep and relaxation functions
73F10 Correspondence principle
73F15 Time-dependent problems
73F20 Aging of materials
73F25 Environmental-dependent materials
73F99 None of the above, but in this section
73Gxx Finite deformations
73G05 Finite elasticity
73G20 Finite plasticity
73G25 Finite viscoelasticity
73G99 None of the above, but in this section
73Hxx Stability (linear and nonlinear)
73H05 Buckling
73H10 Dynamic stability
73H99 None of the above, but in this section
73Kxx Mechanics of structures
73K03 Strings
73K05 Beams, columns, rods
73K10 Plates, discs, membranes
73K12 Dynamics of structures
73K15 Shells
73K20 Composite structures and materials
73K35 Random vibrations
73K40 Optimization [See also 90C90]
73K50 Control of structures
73K70 Aero- or hydromechanic structure interactions
73K99 None of the above, but in this section
73M25 Fracture mechanics
73N20 Geophysical solid mechanics [See also 86A15, 86A17]
73P20 Biomechanics of solids [See also 92C10]
73Q05 Soil and rock mechanics [See also 86A60]
73R05 Electromagnetic elasticity
73S10 Micromechanics of solids
73T05 Contact and surface mechanics
73Vxx Basic methods in solid mechanics [See also 65–xx]
73V05 Finite element methods
73V10 Boundary element methods
73V15 Finite difference methods
73V20 Other numerical methods
73V25 Variational methods
73V30 Stochastic analysis

73V35 Complex variable techniques
73V99 None of the above, but in this section

76–XX FLUID MECHANICS {For general continuum mechanics, see 73Bxx, or other parts of 73–XX}
76–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
76–01 Instructional exposition (textbooks, tutorial papers, etc.)
76–02 Research exposition (monographs, survey articles)
76–03 Historical (must also be assigned at least one classification number from Section 01)
76–04 Explicit machine computation and programs (not the theory of computation or programming)
76–05 Experimental papers
76–06 Proceedings, conferences, collections, etc.
76Axx Foundations, constitutive equations, rheology
76A02 Foundations of fluid mechanics
76A05 Non-Newtonian fluids
76A10 Viscoelastic fluids
76A15 Liquid crystals [See also 82D30]
76A99 None of the above, but in this section
76Bxx Incompressible inviscid fluids, potential theory
76B05 Airfoil theory
76B10 Jets and cavities, cavitation, free-streamline theory, water-entry problems, hydrofoil theory, sloshing
76B15 Water waves, gravity waves; dispersion and diffraction, nonlinear interaction [See also 35Q53]
76B20 Ship waves
76B25 Solitary and cnoidal waves [See also 35Q51]
76B35 Random waves, inviscid fluids
76B40 Added mass computations
76B45 Capillarity
76B99 None of the above, but in this section
76Cxx Incompressible inviscid fluids, vorticity flows
76C05 Vorticity flows
76C10 Internal waves
76C15 Atmospheric waves
76C20 Rossby waves
76C99 None of the above, but in this section
76Dxx Incompressible viscous fluids
76D05 Navier-Stokes equations [See also 35Q30]
76D07 Stokes flows
76D08 Lubrication theory
76D10 Boundary-layer theory
76D15 Boundary-layer separation and reattachment
76D20 Higher-order effects in boundary layers
76D25 Wakes and jets
76D30 Singular perturbation problems
76D33 Waves
76D35 Random waves, viscous fluids
76D45 Capillarity [See also 76B45]
76D99 None of the above, but in this section
76Exx Hydrodynamic stability
76E05 Stability of parallel flows
76E10 Inertial instability
76E15 Convective instability
76E20 Instability of geophysical and astrophysical flows
76E25 Magnetohydrodynamic and electrohydrodynamic instabilities
76E30 Nonlinear effects
76E99 None of the above, but in this section
76Fxx Turbulence [See also 58F13, 58F27, 60Gxx, 60Jxx]
76F05 Homogeneous isotropic turbulence
76F10 Shear flows
76F20 Turbulence via chaos techniques
76F99 None of the above, but in this section
76G25 General aerodynamics and subsonic flows
76H05 Transonic flows
76J20 Supersonic flows
76K05 Hypersonic flows
76L05 Shock waves and blast waves [See also 35L67, 73D05]
76Mxx Basic methods in fluid mechanics [See also 65–XX]
76M10 Finite element methods
76M15 Boundary element methods
76M20 Finite difference methods
76M25 Other numerical methods
76M30 Variational methods
76M35 Stochastic analysis
76M99 None of the above, but in this section
76Nxx Compressible fluids and gas dynamics, general
76N10 Compressible fluids, general [See also 35Q30]
76N15 Gas dynamics, general
76N20 Boundary-layer theory
76N99 None of the above, but in this section
76P05 Rarefied gas flows, Boltzmann equation [See also 82B40, 82C40, 82D05]
76Q05 Hydrodynamic sound, acoustics
76Rxx Diffusion and convection
76R05 Forced convection
76R10 Free convection
76R50 Diffusion [See also 60J60]
76R99 None of the above, but in this section
76S05 Flows in porous media; filtration; seepage
76T05 Two-phase and multiphase flows
76U05 Rotating fluids
76V05 Stratified and reacting fluids
76W05 Magnetohydrodynamics and electrohydrodynamics
76X05 Ionized gas flow in electromagnetic fields; plasmic flow
76Y05 Quantum hydrodynamics and relativistic hydrodynamics [See also 83C55, 85A30]
76Zxx Biological fluid mechanics [See also 92Cxx]
76Z05 Physiological flows [See also 92C35]
76Z10 Biopropulsion in water and in air
76Z99 None of the above, but in this section

78–XX OPTICS, ELECTROMAGNETIC THEORY {For quantum optics, see 81V80}
78–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
78–01 Instructional exposition (textbooks, tutorial papers, etc.)
78–02 Research exposition (monographs, survey articles)
78–03 Historical (must also be assigned at least one classification number from Section 01)
78–04 Explicit machine computation and programs (not the theory of computation or programming)
78–05 Experimental papers
78–06 Proceedings, conferences, collections, etc.
78–08 Computational methods
78A02 Foundations
78A05 Geometric optics
78A10 Physical optics
78A15 Electron optics
78A20 Space charge waves
78A25 Electromagnetic theory, general
78A30 Electro- and magnetostatics
78A35 Motion of charged particles
78A40 Waves and radiation
78A45 Diffraction, scattering [See also 34E20 for WKB methods]
78A50 Antennas, wave-guides
78A55 Technical applications
78A60 Lasers, masers, optical bistability, nonlinear optics [See also 81V80]
78A70 Biological applications [See also 92C30, 92J30]
78A97 Mathematically heuristic optics and electromagnetic theory (must also be assigned at least one other classification number in this section)
78A99 Miscellaneous topics

80–XX CLASSICAL THERMODYNAMICS, HEAT TRANSFER {For thermodynamics of solids, see 73B30}
80–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
80–01 Instructional exposition (textbooks, tutorial papers, etc.)
80–02 Research exposition (monographs, survey articles)
80–03 Historical (must also be assigned at least one classification number from Section 01)
80–04 Explicit machine computation and programs (not the theory of computation or programming)
80–05 Experimental papers
80–06 Proceedings, conferences, collections, etc.
80–08 Computational methods
80A05 Foundations
80A10 Classical thermodynamics
80A15 Thermodynamics of mixtures
80A20 Heat and mass transfer, heat flow
80A22 Stefan problems, phase changes, etc.
80A23 Inverse problems
80A25 Combustion, interior ballistics
80A30 Chemical kinetics [See also 92C45, 92E20]
80A32 Chemically reacting flows [See also 92C45, 92E20]
80A50 Chemistry (general) [See mainly 92Exx]
80A97 Mathematically heuristic classical thermodynamics (must also be assigned at least one other classification number in this section)
80A99 Miscellaneous topics

81–XX QUANTUM THEORY
81–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
81–01 Instructional exposition (textbooks, tutorial papers, etc.)
81–02 Research exposition (monographs, survey articles)
81–03 Historical (must also be assigned at least one classification number from Section 01)

81–04 Explicit machine computation and programs (not the theory of computation or programming)
81–05 Experimental papers
81–06 Proceedings, conferences, collections, etc.
81–08 Computational methods
81Pxx Axiomatics, foundations, philosophy
81P05 General and philosophical
81P10 Logical foundations of quantum mechanics
81P15 Quantum measurement theory
81P20 Stochastic mechanics (including stochastic electrodynamics)
81P99 None of the above, but in this section
81Qxx General mathematical topics and methods in quantum theory
81Q05 Closed and approximate solutions to the Schrödinger, Dirac, Klein-Gordon and other quantum mechanical equations
81Q10 Selfadjoint operator theory in quantum theory, including spectral analysis
81Q15 Perturbation theories for operators and differential equations
81Q20 Semiclassical techniques including WKB and Maslov methods
81Q30 Feynman integrals and graphs; applications of algebraic topology and algebraic geometry [See also 14D05, 32S40]
81Q40 Bethe-Salpeter and other integral equations
81Q50 Quantum chaos [See also 58F13]
81Q60 Supersymmetric quantum mechanics
81Q99 None of the above, but in this section
81Rxx Groups and algebras in quantum theory
81R05 Representations of finite-dimensional groups and algebras motivated by physics [See also 20C35, 22E70]
81R10 Representations of infinite-dimensional groups and algebras motivated by physics, including Virasoro, Kac-Moody and other current algebras [See also 17B65, 17B67, 22E65, 22E67, 22E70]
81R20 Covariant wave equations
81R25 Spinor and twistor methods [See also 32L25]
81R30 Coherent states [See also 22E45]
81R40 Symmetry breaking
81R50 Quantum groups and related algebraic methods [See also 16W30, 17B37]
81R99 None of the above, but in this section
81Sxx General quantum mechanics and problems of quantization
81S05 Commutation relations
81S10 Geometric quantization, symplectic methods [See also 58F06]
81S20 Stochastic quantization
81S25 Quantum stochastic calculus
81S30 Phase space methods including Wigner distributions, etc.
81S40 Path integrals [See also 58D30]
81S99 None of the above, but in this section
81Txx Quantum field theory; related classical field theories
81T05 Axiomatic quantum field theory; operator algebras
81T08 Constructive quantum field theory
81T10 Model quantum field theories
81T13 Yang-Mills and other gauge theories [See also 53C07, 58E15]
81T15 Perturbative methods of renormalization
81T16 Nonperturbative methods of renormalization
81T17 Renormalization group methods
81T18 Feynman diagrams
81T20 Quantum field theory on curved space backgrounds
81T25 Quantum field theory on lattices
81T27 Continuum limits
81T30 String and superstring theories; other extended objects [See also 83E30]
81T40 Two-dimensional field theories, conformal field theories, etc.
81T50 Anomalies
81T60 Supersymmetric field theories
81T70 Quantization in field theory; cohomological methods [See also 58F06]
81T80 Simulation and numerical modeling
81T99 None of the above, but in this section
81Uxx Scattering theory [See also 47A40]
81U05 2-body potential scattering theory [See also 34E20 for WKB methods]
81U10 n-body potential scattering theory
81U20 S-matrix theory, etc.
81U30 Dispersion theory, dispersion relations
81U40 Inverse scattering problems [See also 58F07, 58F19]
81U99 None of the above, but in this section
81Vxx Applications to specific physical systems
81V05 Strong interaction, including quantum chromodynamics
81V10 Electromagnetic interaction; quantum electrodynamics
81V15 Weak interaction
81V17 Gravitational interaction
81V19 Other fundamental interactions
81V22 Unified theories
81V25 Other elementary particle theory
81V35 Nuclear physics
81V45 Atomic physics
81V55 Molecular physics [See also 92E10]
81V70 Many-body theory
81V80 Quantum optics
81V99 None of the above, but in this section

82–XX STATISTICAL MECHANICS, STRUCTURE OF MATTER
82–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
82–01 Instructional exposition (textbooks, tutorial papers, etc.)
82–02 Research exposition (monographs, survey articles)
82–03 Historical (must also be assigned at least one classification number from Section 01)
82–04 Explicit machine computation and programs (not the theory of computation or programming)
82–05 Experimental papers
82–06 Proceedings, conferences, collections, etc.
82–08 Computational methods
82Bxx Equilibrium statistical mechanics
82B03 Foundations
82B05 Classical equilibrium statistical mechanics (general)
82B10 Quantum equilibrium statistical mechanics (general)
82B20 Lattice systems (Ising, dimer, Potts, etc.)
82B21 Continuum models (systems of particles, etc.)
82B23 Exactly solvable models
82B24 Interface problems
82B26 Phase transitions (general)
82B27 Critical phenomena
82B28 Renormalization group methods [See also 81T17]
82B30 Statistical thermodynamics [See also 80–XX]
82B31 Stochastic methods
82B35 Irreversible thermodynamics, including Onsager-Machlup theory [See also 92E20]
82B40 Kinetic theory of gases
82B41 Random walks, random surfaces, lattice animals, etc. [See also 60J15, 82C41]
82B43 Percolation [See also 60K35]
82B44 Disordered systems (random Ising models, random Schrödinger operators, etc.)
82B80 Numerical methods (Monte Carlo, series resummation, etc.) [See also 65–XX, 81T80]
82B99 Miscellaneous topics
82Cxx Time-dependent statistical mechanics (dynamic and nonequilibrium)
82C03 Foundations
82C05 Classical dynamic and nonequilibrium statistical mechanics (general)
82C10 Quantum dynamics and nonequilibrium statistical mechanics (general)
82C20 Dynamic lattice systems (kinetic Ising, etc.)
82C21 Dynamic continuum models (systems of particles, etc.)
82C22 Interacting particle systems [See also 60K35]
82C23 Exactly solvable dynamic models [See also 58F07]
82C24 Interface problems
82C26 Dynamic and nonequilibrium phase transitions (general)
82C27 Dynamic critical phenomena
82C28 Dynamic renormalization group methods [See also 81T17]
82C31 Stochastic methods (Fokker-Planck, Langevin, etc.) [See also 60H10]
82C32 Neural nets [See also 68T05, 92B20, 92J40]
82C35 Irreversible thermodynamics, including Onsager-Machlup theory
82C40 Kinetic theory of gases
82C41 Dynamics of random walks, random surfaces, lattice animals, etc. [See also 60J15]
82C43 Time-dependent percolation [See also 60K35]
82C44 Dynamics of disordered systems (random Ising systems, etc.)
82C70 Transport processes
82C80 Numerical methods (Monte Carlo, series resummation, etc.)
82C99 None of the above, but in this section
82Dxx Applications to specific types of physical systems
82D05 Gases
82D10 Plasmas
82D15 Liquids
82D20 Solids
82D25 Crystals {For crystallographic group theory, see 20H15}
82D30 Random media, disordered materials (including liquid crystals and spin glasses)
82D35 Metals
82D40 Magnetic materials
82D45 Ferroelectrics
82D50 Superfluids
82D55 Superconductors
82D60 Polymers
82D75 Nuclear reactor theory
82D99 None of the above, but in this section

83–XX RELATIVITY AND GRAVITATIONAL THEORY
83–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
83–01 Instructional exposition (textbooks, tutorial papers, etc.)
83–02 Research exposition (monographs, survey articles)
83–03 Historical (must also be assigned at least one classification number from Section 01)
83–04 Explicit machine computation and programs (not the theory of computation or programming)
83–05 Experimental papers
83–06 Proceedings, conferences, collections, etc.
83–08 Computational methods
83A05 Special relativity
83B05 Observational and experimental questions
83Cxx General relativity
83C05 Einstein's equations (general structure, canonical formalism, Cauchy problems)
83C10 Equations of motion
83C15 Exact solutions
83C20 Classes of solutions; algebraically special solutions, metrics with symmetries
83C22 Electromagnetic fields, Einstein-Maxwell equations
83C25 Approximation procedures, weak fields
83C27 Lattice gravity, Regge calculus and other discrete methods
83C30 Asymptotic procedures (radiation, news functions, $\mathscr{H}$-spaces, etc.)
83C35 Gravitational waves
83C40 Gravitational energy and conservation laws; groups of motions
83C45 Quantization of the gravitational field
83C47 Quantum field theory aspects [See also 81T20]
83C50 Electromagnetic fields
83C55 Macroscopic interaction of the gravitational field with matter (hydrodynamics, etc.)
83C57 Black holes
83C60 Spinor and twistor methods
83C75 Space-time singularities, cosmic censorship, etc.
83C99 None of the above, but in this section
83D05 Relativistic gravitational theories other than Einstein's, including asymmetric field theories
83Exx Unified, higher-dimensional and super field theories
83E05 Geometrodynamics
83E15 Kaluza-Klein and other higher-dimensional theories
83E30 String and superstring theories [See also 81T30]
83E50 Supergravity
83E99 None of the above, but in this section
83F05 Cosmology

85–XX ASTRONOMY AND ASTROPHYSICS {For celestial mechanics, see 70F15}
85–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
85–01 Instructional exposition (textbooks, tutorial papers, etc.)
85–02 Research exposition (monographs, survey articles)
85–03 Historical (must also be assigned at least one classification number from Section 01)
85–04 Explicit machine computation and programs (not the theory of computation or programming)
85–05 Experimental papers
85–06 Proceedings, conferences, collections, etc.
85–08 Computational methods
85A04 General
85A05 Galactic and stellar dynamics
85A15 Galactic and stellar structure
85A20 Stellar atmospheres
85A25 Radiative transfer
85A30 Hydrodynamic and hydromagnetic problems [See also 76Y05]
85A35 Statistical astronomy
85A40 Cosmology {For relativistic cosmology, see 83F05}
85A45 Radio astronomy
85A99 Miscellaneous topics

86–XX GEOPHYSICS [See also 73N20, 76U05, 76V05]
86–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
86–01 Instructional exposition (textbooks, tutorial papers, etc.)
86–02 Research exposition (monographs, survey articles)
86–03 Historical (must also be assigned at least one classification number from Section 01)
86–04 Explicit machine computation and programs (not the theory of computation or programming)
86–05 Experimental papers
86–06 Proceedings, conferences, collections, etc.
86–08 Computational methods
86A04 General
86A05 Hydrology, hydrography, oceanography [See also 76B15, 76B20, 76B25, 76C15, 76E20, 76Q05, 76Rxx, 76U05]
86A10 Meteorology and atmospheric physics [See also 76Bxx, 76C15, 76C20, 76E20, 76N15, 76Q05, 76Rxx, 76U05, 76V05]
86A15 Seismology [See also 73Dxx, 73Fxx, 73M25, 73N20, 73Q05]
86A17 Global dynamics, earthquake problems
86A20 Potentials, prospecting [See also 76S05, 76W05]
86A22 Inverse problems [See also 35R30]
86A25 Geo-electricity and geomagnetism [See also 78A25]
86A30 Geodesy, mapping problems
86A32 Geostatistics
86A40 Glaciology
86A60 Geological problems
86A99 Miscellaneous topics

90–XX ECONOMICS, OPERATIONS RESEARCH, PROGRAMMING, GAMES
90–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
90–01 Instructional exposition (textbooks, tutorial papers, etc.)
90–02 Research exposition (monographs, survey articles)
90–03 Historical (must also be assigned at least one classification number from Section 01)
90–04 Explicit machine computation and programs (not the theory of computation or programming)
90–06 Proceedings, conferences, collections, etc.
90–08 Computational methods
90Axx Mathematical economics {For econometrics, see 62P20}
90A05 Decision theory [See also 62Cxx, 90B50, 90D35]
90A06 Individual preferences
90A07 Group preferences
90A08 Social choice
90A09 Finance, portfolios, investment
90A10 Utility theory
90A11 Production theory, theory of the firm
90A12 Price theory and market structure
90A14 Equilibrium: general theory
90A15 General economic models, trade models
90A16 Dynamic economic models, growth models
90A17 Multisectoral models
90A19 Statistical models; economic indexes and measures
90A20 Economic time series analysis [See also 62M10]
90A25 Spatial models
90A27 Public goods
90A28 Voting theory
90A30 Environmental economics (natural resource models, harvesting, pollution, etc.)
90A35 Informational economics
90A36 Incentives theory
90A40 Consumer behavior, demand theory
90A43 Expected utility; risk-averse utility
90A46 Risk theory
90A50 Labor market
90A53 Special types of economies
90A56 Special types of equilibria
90A58 Models of real-world systems; general macro-economic models, etc.
90A60 Market models (auctions, bargaining, bidding, selling, etc.)
90A70 Macro-economic policy-making, taxation
90A80 Resource allocation
90A99 None of the above, but in this section
90Bxx Operations research and management science
90B05 Inventory, storage, reservoirs
90B06 Transportation, logistics
90B10 Flows in networks, deterministic
90B12 Communication networks [See also 68M10, 94A05]
90B15 Flows in networks, probabilistic
90B20 Highway traffic
90B22 Queues and service [See also 60K25, 68M20]
90B25 Reliability, availability, maintenance, inspection [See also 60K10, 62N05]
90B30 Production models
90B35 Scheduling theory [See also 68M20]
90B40 Search theory
90B50 Management decision-making, including multiple objectives [See also 90A05, 90C31, 90D35]
90B60 Marketing, advertising [See also 90A60]
90B70 Theory of organizations, industrial and manpower planning [See also 92H35]
90B80 Discrete location and assignment [See also 90C10]
90B85 Continuous location
90B90 Case-oriented studies
90B99 None of the above, but in this section

90Cxx Mathematical programming [See also 49Mxx, 65Kxx]
90C05 Linear programming
90C06 Large-scale problems
90C08 Special problems of linear programming (transportation, multi-index, etc.)
90C09 Boolean programming
90C10 Integer programming
90C11 Mixed integer programming
90C15 Stochastic programming
90C20 Quadratic programming
90C25 Convex programming
90C26 Nonconvex programming, quasiconvex programming
90C27 Combinatorial optimization
90C28 Geometric programming
90C29 Multi-objective and goal programming; vector optimization
90C30 Nonlinear programming
90C31 Sensitivity, stability, parametric optimization
90C32 Fractional programming
90C33 Complementarity problems
90C34 Semi-infinite programming
90C35 Programming involving graphs or networks
90C39 Dynamic programming [See also 49L20]
90C40 Markov and semi-Markov decision processes
90C42 Markov programming and Markov renewal programming
90C45 Continuous programming
90C48 Programming in abstract spaces
90C60 Abstract computational complexity for mathematical programming problems [See also 68Q25]
90C70 Fuzzy programming
90C90 Applications of mathematical programming
90C99 None of the above, but in this section
90Dxx Game theory
90D05 2-person games
90D06 n-person games, $n > 2$
90D10 Noncooperative games
90D12 Cooperative games
90D13 Games with infinitely many players
90D15 Stochastic games [See also 93E05]
90D20 Multistage and repeated games
90D25 Differential games [See also 49N55]
90D26 Pursuit and evasion games
90D35 Decision theory for games [See also 62Cxx, 90A05, 90B50]
90D40 Game-theoretic models [See also 65Cxx]
90D42 Positional games
90D43 Games involving graphs
90D44 Games involving topology or set theory
90D46 Combinatorial games
90D50 Discrete-time games
90D55 Games of timing
90D60 Probabilistic games; gambling
90D65 Hierarchical games
90D70 Spaces of games
90D80 Applications of game theory
90D99 None of the above, but in this section

92–XX BIOLOGY AND OTHER NATURAL SCIENCES, BEHAVIORAL SCIENCES
92–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
92–01 Instructional exposition (textbooks, tutorial papers, etc.)
92–02 Research exposition (monographs, survey articles)
92–03 Historical (must also be assigned at least one classification number from Section 01)
92–04 Explicit machine computation and programs (not the theory of computation or programming)
92–06 Proceedings, conferences, collections, etc.
92–08 Computational methods
92Bxx Mathematical biology in general
92B05 General biology and biomathematics
92B10 Taxonomy, statistics
92B15 General biostatistics [See also 62P10]
92B20 Neural networks [See also 68T05, 82C32, 94Cxx]
92B99 None of the above, but in this section
92Cxx Physiological, cellular and medical topics
92C05 Biophysics
92C10 Biomechanics [See also 73P20]
92C15 Developmental biology, pattern formation
92C20 Neural biology
92C30 Physiology (general)
92C35 Physiological flow [See also 76Z05]
92C40 Biochemistry, molecular biology
92C45 Kinetics in biochemical problems (pharmacokinetics, enzyme kinetics, etc.) [See also 80A30]
92C50 Medical applications (general)
92C55 Tomography [See also 44A12, 65R10]
92C60 Medical epidemiology
92C99 None of the above, but in this section
92Dxx Genetics and population dynamics
92D10 Genetics {For genetic algebras, see 17D92}
92D15 Problems related to evolution
92D20 Protein sequences, DNA sequences
92D25 Population dynamics (general)
92D30 Epidemiology
92D40 Ecology
92D50 Animal behavior
92D99 None of the above, but in this section
92Exx Chemistry {For biochemistry, see 92C40}
92E10 Molecular structure (graph-theoretic methods, methods of differential topology, etc.)
92E20 Classical flows, reactions, etc. [See also 80A30, 80A32]
92E99 None of the above, but in this section
92F05 Other natural sciences
92Gxx Social and behavioral sciences: methodology {For statistics, see 62–XX}
92G05 Measurement theory
92G15 One- and multidimensional scaling
92G20 Test theory
92G25 Questionnaire analysis
92G30 Clustering [See also 62H30]
92G40 Q-analysis
92G99 None of the above, but in this section
92Hxx Mathematical sociology (including anthropology)
92H10 Models of societies, social and urban evolution
92H20 Mathematical geography and demography
92H25 Spatial models [See also 90A25]
92H30 Social networks
92H35 Manpower systems [See also 90A50, 90B70]
92H99 None of the above, but in this section
92Jxx Mathematical psychology
92J10 Cognitive psychology
92J30 Psychophysics and psychophysiology; perception
92J40 Memory and learning [See also 68T05]
92J45 Measurement and performance
92J99 None of the above, but in this section
92Kxx Other social and behavioral sciences (mathematical treatment)
92K10 History, political science
92K20 Linguistics [See also 03B65, 68S05]
92K99 None of the above, but in this section

93–XX SYSTEMS THEORY; CONTROL {For optimal control, see 49–XX}
93–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
93–01 Instructional exposition (textbooks, tutorial papers, etc.)
93–02 Research exposition (monographs, survey articles)
93–03 Historical (must also be assigned at least one classification number from Section 01)
93–04 Explicit machine computation and programs (not the theory of computation or programming)
93–06 Proceedings, conferences, collections, etc.
93Axx General
93A05 Axiomatic system theory
93A10 General systems
93A13 Hierarchical systems
93A14 Decentralized systems
93A15 Large-scale systems
93A20 Cascaded systems
93A25 Input-output systems
93A30 Mathematical modeling (models of systems, model-matching, etc.)
93A99 None of the above, but in this section
93Bxx Controllability, observability, and system structure
93B03 Attainable sets
93B05 Controllability
93B06 Relations between controllability and optimal solutions
93B07 Observability
93B10 Canonical structure
93B11 System structure simplification
93B12 Variable structure systems
93B15 Realizability of systems from input-output data
93B17 Transformation
93B18 Linearizability
93B20 Minimal systems representations
93B25 Algebraic methods
93B27 Geometric methods (including algebro-geometric)
93B28 Operator-theoretic methods [See also 47A57, 47N70]
93B29 Differential-geometric methods
93B30 System identification
93B35 Sensitivity (robustness)

93B36 H^∞-control
93B40 Computational methods
93B50 Synthesis problems
93B51 Design techniques (robust design, computer-aided design, etc.)
93B52 Feedback control
93B55 Pole and zero placement problems
93B60 Eigenvalue problems
93B99 None of the above, but in this section
93Cxx Control systems, guided systems
93C05 Linear
93C10 Nonlinear
93C15 Systems governed by ordinary differential equations
93C20 Systems governed by partial differential equations
93C22 Systems governed by integral equations
93C25 Systems in abstract spaces
93C30 Systems governed by functional relations other than differential or integral equations
93C35 Multivariable, multidimensional systems
93C40 Adaptive control systems
93C41 Problems with incomplete information
93C42 Fuzzy control
93C45 Time-invariant
93C50 Time-dependent
93C55 Discrete-time
93C57 Sampled-data
93C60 Continuous-time
93C62 Digital systems
93C70 Time-scale analysis and related topics
93C73 Perturbations in control systems
93C80 Frequency-response methods
93C83 Control problems involving computers (process control, etc.)
93C85 Automated systems (robots, etc.)
93C90 Random disturbances in control systems
93C95 Applications of control theory
93C99 None of the above, but in this section
93Dxx Stability
93D05 Lyapunov and other classical stabilities (Lagrange, Poisson, L^p, l^p, etc.)
93D09 Robust stability
93D10 Popov-type stability of feedback systems
93D15 Stabilization of systems by feedback
93D20 Asymptotic stability
93D21 Adaptive and robust stabilization
93D22 Interrelations between stability problems and optimization problems
93D25 Input-output approaches
93D30 Scalar and vector Lyapunov functions
93D99 None of the above, but in this section
93Exx Stochastic systems and control
93E03 Stochastic systems, general
93E05 Stochastic games, stochastic differential games [See also 90D15]
93E10 Estimation and detection [See also 60G35]
93E11 Filtering [See also 60G35]
93E12 System identification
93E14 Data smoothing
93E15 Stochastic stability
93E20 Optimal stochastic control
93E23 Stochastic gradient methods
93E24 Least squares and related methods
93E25 Other computational methods
93E30 Computer simulations of stochastic systems
93E35 Stochastic learning and adaptive control
93E99 None of the above, but in this section

94–XX INFORMATION AND COMMUNICATION, CIRCUITS
94–00 General reference works (handbooks, dictionaries, bibliographies, etc.)
94–01 Instructional exposition (textbooks, tutorial papers, etc.)
94–02 Research exposition (monographs, survey articles)
94–03 Historical (must also be assigned at least one classification number from Section 01)
94–04 Explicit machine computation and programs (not the theory of computation or programming)
94–06 Proceedings, conferences, collections, etc.
94Axx Communication, information
94A05 Communication theory [See also 60G35, 90B12]
94A11 Application of orthogonal functions in communication
94A12 Signal theory (characterization, reconstruction, etc.)
94A13 Detection theory
94A14 Modulation and demodulation
94A15 Information theory, general [See also 62B10]
94A17 Measures of information, entropy
94A24 Coding theorems (Shannon theory)
94A29 Source coding
94A34 Rate-distortion theory
94A40 Channel models
94A45 Prefix, length-variable, comma-free codes [See also 20M35, 68Q45]
94A50 Theory of questionnaires
94A55 Shift register sequences
94A60 Cryptography [See also 11T71, 68P25]
94A99 None of the above, but in this section
94Bxx Theory of error-correcting codes
94B05 Linear codes, general
94B10 Convolutional codes
94B12 Combined modulation schemes (including trellis codes)
94B15 Cyclic codes
94B20 Burst-correcting codes
94B25 Combinatorial codes
94B27 Geometric methods (including applications of algebraic geometry) [See also 11T71]
94B30 Majority codes
94B35 Decoding
94B40 Arithmetic codes [See also 11T71]
94B50 Synchronization error-correcting codes
94B60 Other types of codes
94B65 Bounds on codes
94B70 Error probability
94B75 Applications of the theory of convex sets and geometry of numbers (covering radius, etc.) [See also 11H31]
94B99 None of the above, but in this section
94Cxx Circuits, networks
94C05 Analytic circuit theory
94C10 Switching theory, application of Boolean algebra; Boolean functions [See also 06E30]
94C12 Fault detection; testing
94C15 Applications of graph theory [See also 05Cxx, 68R10]
94C30 Applications of design theory [See also 05Bxx]
94C99 None of the above, but in this section
94D05 Fuzzy sets and logic (in connection with questions of Section 94) [See also 03B52, 03E72, 04A72, 28E10]