MSC2010

MSC2010

This document is a printed form of MSC2010, an MSC revision produced jointly by the editorial staffs of Mathematical Reviews (MR) and Zentralblatt für Mathematik (Zbl) in consultation with the mathematical community. The goals of this revision of the Mathematics Subject Classification (MSC) were set out in the announcement of it and call for comments by the Executive Editor of MR and the Chief Editor of Zbl in August 2006. This document results from the MSC revision process that has been going on since then. MSC2010 will be fully deployed from July 2010.

The editors of MR and Zbl deploying this revision therefore ask for feedback on remaining errors to help in this work, which should be given, preferably, on the Web site at `http://msc2010.org` or, if the internet is not available, through e-mail to `feedback@msc2010.org`. They are grateful for the many suggestions that were received previously which have much influenced what we have.

How to use the Mathematics Subject Classification [MSC]

The main purpose of the classification of items in the mathematical literature using the Mathematics Subject Classification scheme is to help users find the items of present or potential interest to them as readily as possible—in products derived from the Mathematical Reviews Database (MRDB) such as MathSciNet, in Zentralblatt MATH (ZMATH), or anywhere else where this classification scheme is used. An item in the mathematical literature should be classified so as to attract the attention of all those possibly interested in it. The item may be something which falls squarely within one clear area of the MSC, or it may involve several areas. Ideally, the MSC codes attached to an item should represent the subjects to which the item contains a contribution. The classification should serve both those closely concerned with specific subject areas, and those familiar enough with subjects to apply their results and methods elsewhere, inside or outside of mathematics. It will be extremely useful for both users 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 item in the MRDB or ZMATH receives precisely one *primary* classification, which is simply the MSC code that describes its principal contribution. When an item contains several principal contributions to different areas, the primary classification should cover the most important among them. A paper or book may be assigned one or several secondary classification numbers to cover any remaining principal contributions, ancillary results, motivation or origin of the matters discussed, intended or potential field of application, or other significant aspects worthy of notice.

The principal contribution is meant to be the one including the most important part of the work actually done in the item. 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, would have a primary classification in 05C (Graph Theory) with one or more secondary classifications in 68 (Computer Science); 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.

There are two types of cross-references given at the end of many of the entries in the MSC. The first type is in braces: "{For A, see X}"; if this appears in section Y, it means that contributions described by A should usually be assigned the classification code X, not Y. The other type of cross-reference merely points out related classifications; it is in brackets: "[See also …]", "[See mainly …]", etc., and the classification codes listed in the brackets may, but need not, be included in the classification codes of a paper, or they may be used in place of the classification where the cross-reference is given. The classifier must 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 [See also 97A20]
00A09 Popularization of mathematics
00A15 Bibliographies
00A17 External book reviews
00A20 Dictionaries and other general reference works
00A22 Formularies
00A30 Philosophy of mathematics [See also 03A05]
00A35 Methodology of mathematics, didactics [See also 97Cxx, 97Dxx]
00A65 Mathematics and music
00A66 Mathematics and visual arts, visualization
00A67 Mathematics and architecture
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]
00B99 None of the above, but in this section
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
01A61 Twenty-first 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
01A85 Historiography
01A90 Bibliographic studies
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.
03Axx   **Philosophical aspects of logic and foundations**
03A05   Philosophical and critical {For philosophy of mathematics, see also 00A30}
03A10   Logic in the philosophy of science
03A99   None of the above, but in this section
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 of classical theories (including reverse mathematics) [See also 03F35]
03B35   Mechanization of proofs and logical operations [See also 68T15]
03B40   Combinatory logic and lambda-calculus [See also 68N18]
03B42   Logics of knowledge and belief (including belief change)
03B44   Temporal logic
03B45   Modal logic (including the logic of norms) {For knowledge and belief, see 03B42; for temporal logic, see 03B44; for provability logic, see also 03F45}
03B47   Substructural logics (including relevance, entailment, linear logic, Lambek calculus, BCK and BCI logics) {For proof-theoretic aspects see 03F52}
03B48   Probability and inductive logic [See also 60A05]
03B50   Many-valued logic
03B52   Fuzzy logic; logic of vagueness [See also 68T27, 68T37, 94D05]
03B53   Paraconsistent logics
03B55   Intermediate logics
03B60   Other nonclassical logic
03B62   Combined logics
03B65   Logic of natural languages [See also 68T50, 91F20]
03B70   Logic in computer science [See also 68–XX]
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, 08Bxx, 18C05]
03C07   Basic properties of first-order languages and structures
03C10   Quantifier elimination, model completeness and related topics
03C13   Finite structures [See also 68Q15, 68Q19]
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   Classification theory, stability and related concepts [See also 03C48]
03C48   Abstract elementary classes and related topics [See also 03C45]
03C50   Models with special properties (saturated, rigid, etc.)
03C52   Properties of classes of models
03C55   Set-theoretic model theory
03C57   Effective and 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]
03C64   Model theory of ordered structures; o-minimality
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 03B42, 03B44, 03B45, 03B48]
03C85   Second- and higher-order model theory
03C90   Nonclassical models (Boolean-valued, sheaf, etc.)
03C95   Abstract model theory
03C98   Applications of model theory [See also 03C60]
03C99   None of the above, but in this section
03Dxx   **Computability and recursion theory**
03D03   Thue and Post systems, etc.
03D05   Automata and formal grammars in connection with logical questions [See also 68Q45, 68Q70, 68R15]
03D10   Turing machines and related notions [See also 68Q05]
03D15   Complexity of computation (including implicit computational complexity) [See also 68Q15, 68Q17]
03D20   Recursive functions and relations, subrecursive hierarchies
03D25   Recursively (computably) enumerable sets and degrees
03D28   Other Turing degree structures

03D30   Other degrees and reducibilities
03D32   Algorithmic randomness and dimension [See also 68Q30]
03D35   Undecidability and degrees of sets of sentences
03D40   Word problems, etc. [See also 06B25, 08A50, 20F10, 68R15]
03D45   Theory of numerations, effectively presented structures [See also 03C57; for intuitionistic and similar approaches see 03F55]
03D50   Recursive equivalence types of sets and structures, isols
03D55   Hierarchies
03D60   Computability and recursion theory on ordinals, admissible sets, etc.
03D65   Higher-type and set recursion theory
03D70   Inductive definability
03D75   Abstract and axiomatic computability and recursion theory
03D78   Computation over the reals {For constructive aspects, see 03F60}
03D80   Applications of computability and recursion theory
03D99   None of the above, but in this section
03Exx   **Set theory**
03E02   Partition relations
03E04   Ordered sets and their cofinalities; pcf theory
03E05   Other combinatorial set theory
03E10   Ordinal and cardinal numbers
03E15   Descriptive set theory [See also 28A05, 54H05]
03E17   Cardinal characteristics of the continuum
03E20   Other classical set theory (including functions, relations, and set algebra)
03E25   Axiom of choice and related propositions
03E30   Axiomatics of classical set theory and its fragments
03E35   Consistency and independence results
03E40   Other aspects of forcing and Boolean-valued models
03E45   Inner models, including constructibility, ordinal definability, and core models
03E47   Other notions of set-theoretic definability
03E50   Continuum hypothesis and Martin's axiom [See also 03E57]
03E55   Large cardinals
03E57   Generic absoluteness and forcing axioms [See also 03E50]
03E60   Determinacy principles
03E65   Other hypotheses and axioms
03E70   Nonclassical and second-order set theories
03E72   Fuzzy set theory
03E75   Applications of set theory
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 03B30]
03F40   Gödel numberings and issues of incompleteness
03F45   Provability logics and related algebras (e.g., diagonalizable algebras) [See also 03B45, 03G25, 06E25]
03F50   Metamathematics of constructive systems
03F52   Linear logic and other substructural logics [See also 03B47]
03F55   Intuitionistic mathematics
03F60   Constructive and recursive analysis [See also 03B30, 03D45, 03D78, 26E40, 46S30, 47S30]
03F65   Other constructive mathematics [See also 03D45]
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 06C15, 81P10]
03G15   Cylindric and polyadic algebras; relation algebras
03G20   Lukasiewicz and Post algebras [See also 06D25, 06D30]
03G25   Other algebras related to logic [See also 03F45, 06D20, 06E25, 06F35]
03G27   Abstract algebraic logic
03G30   Categorical logic, topoi [See also 18B25, 18C05, 18C10]
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

[MSC Source Date: Monday 21 December 2009 09:49]

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   **Enumerative combinatorics** {**For enumeration in graph theory, see 05C30**}
05A05   Permutations, words, matrices
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, bijective combinatorics
05A20   Combinatorial inequalities
05A30 q-calculus and related topics [See also 33Dxx]
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 68R10, 81Q30, 81T15, 82B20, 82C20, 90C35, 92E10, 94C15**}
05C05   Trees
05C07   Vertex degrees [See also 05E30]
05C10   Planar graphs; geometric and topological aspects of graph theory [See also 57M15, 57M25]
05C12   Distance in graphs
05C15   Coloring of graphs and hypergraphs
05C17   Perfect graphs
05C20   Directed graphs (digraphs), tournaments
05C21   Flows in graphs
05C22   Signed and weighted graphs
05C25   Graphs and abstract algebra (groups, rings, fields, etc.) [See also 20F65]
05C30   Enumeration in graph theory
05C31   Graph polynomials
05C35   Extremal problems [See also 90C35]
05C38   Paths and cycles [See also 90B10]
05C40   Connectivity
05C42   Density (toughness, etc.)
05C45   Eulerian and Hamiltonian graphs
05C50   Graphs and linear algebra (matrices, eigenvalues, etc.)
05C51   Graph designs and isomomorphic decomposition [See also 05B30]
05C55   Generalized Ramsey theory [See also 05D10]
05C57   Games on graphs [See also 91A43, 91A46]
05C60   Isomorphism problems (reconstruction conjecture, etc.) and homomorphisms (subgraph embedding, etc.)
05C62   Graph representations (geometric and intersection representations, etc.) For graph drawing, see also 68R10
05C63   Infinite graphs
05C65   Hypergraphs
05C69   Dominating sets, independent sets, cliques
05C70   Factorization, matching, partitioning, covering and packing
05C72   Fractional graph theory, fuzzy graph theory
05C75   Structural characterization of families of graphs
05C76   Graph operations (line graphs, products, etc.)
05C78   Graph labelling (graceful graphs, bandwidth, etc.)
05C80   Random graphs [See also 60B20]
05C81   Random walks on graphs
05C82   Small world graphs, complex networks [See also 90Bxx, 91D30]

05C83   Graph minors
05C85   Graph algorithms [See also 68R10, 68W05]
05C90   Applications [See also 68R10, 81Q30, 81T15, 82B20, 82C20, 90C35, 92E10, 94C15]
05C99   None of the above, but in this section
05Dxx   **Extremal combinatorics**
05D05   Extremal set theory
05D10   Ramsey theory [See also 05C55]
05D15   Transversal (matching) theory
05D40   Probabilistic methods
05D99   None of the above, but in this section
05Exx   **Algebraic combinatorics**
05E05   Symmetric functions and generalizations
05E10   Combinatorial aspects of representation theory [See also 20C30]
05E15   Combinatorial aspects of groups and algebras [See also 14Nxx, 22E45, 33C80]
05E18   Group actions on combinatorial structures
05E30   Association schemes, strongly regular graphs
05E40   Combinatorial aspects of commutative algebra
05E45   Combinatorial aspects of simplicial complexes
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
06A11   Algebraic aspects of posets
06A12   Semilattices [See also 20M10; for topological semilattices see 22A26]
06A15   Galois correspondences, closure operators
06A75   Generalizations of ordered sets
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
06B23   Complete lattices, completions
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 and posets, applications [See also 06B30, 06D10, 06F30, 18B35, 22A26, 68Q55]
06B75   Generalizations of lattices
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 and posets [See also 03G12, 81P10]
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 03G25]
06D22   Frames, locales {For topological questions see 54–XX}
06D25   Post algebras [See also 03G20]
06D30   De Morgan algebras, Lukasiewicz algebras [See also 03G20]
06D35   MV-algebras
06D50   Lattices and duality
06D72   Fuzzy lattices (soft algebras) and related topics
06D75   Other generalizations of distributive lattices
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 spaces (Boolean spaces) and related structures
06E20   Ring-theoretic properties [See also 16E50, 16G30]

06E25   Boolean algebras with additional operations (diagonalizable algebras, etc.) [See also 03G25, 03F45]
06E30   Boolean functions [See also 94C10]
06E75   Generalizations of Boolean algebras
06E99   None of the above, but in this section
06Fxx   **Ordered structures**
06F05   Ordered semigroups and monoids [See also 20Mxx]
06F07   Quantales
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
08A68   Heterogeneous algebras
08A70   Applications of universal algebra in computer science
08A72   Fuzzy algebraic structures
08A99   None of the above, but in this section
08Bxx   **Varieties** [See also 03C05]
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
08C20   Natural dualities for classes of algebras [See also 06E15, 18A40, 22A30]
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, including sumsets [See also 05B10]
11B25   Arithmetic progressions [See also 11N13]
11B30   Arithmetic combinatorics; higher degree uniformity
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 15B36]
11C99   None of the above, but in this section
11Dxx   **Diophantine equations** [See also 11Gxx, 14Gxx]
11D04   Linear equations
11D07   The Frobenius problem
11D09   Quadratic and bilinear equations
11D25   Cubic and quartic equations
11D41   Higher degree equations; Fermat's equation
11D45   Counting solutions of Diophantine equations
11D57   Multiplicative and norm form equations
11D59   Thue-Mahler 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   Holomorphic modular forms of integral weight
11F12   Automorphic forms, one variable
11F20   Dedekind eta function, Dedekind sums
11F22   Relationship to Lie algebras and finite simple groups
11F23   Relations with algebraic geometry and topology

11F25	Hecke-Petersson operators, differential operators (one variable)
11F27	Theta series; Weil representation; theta correspondences
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	Automorphic forms on GL(2); Hilbert and Hilbert-Siegel modular groups and their modular and automorphic forms; Hilbert modular surfaces [See also 14J20]
11F46	Siegel modular groups; Siegel and Hilbert-Siegel modular and automorphic forms
11F50	Jacobi forms
11F52	Modular forms associated to Drinfel′d modules
11F55	Other groups and their modular and automorphic forms (several variables)
11F60	Hecke-Petersson operators, differential operators (several variables)
11F66	Langlands L-functions; one variable Dirichlet series and functional equations
11F67	Special values of automorphic L-series, periods of modular forms, cohomology, modular symbols
11F68	Dirichlet series in several complex variables associated to automorphic forms; Weyl group multiple Dirichlet series
11F70	Representation-theoretic methods; automorphic representations over local and global fields
11F72	Spectral theory; Selberg trace formula
11F75	Cohomology of arithmetic groups
11F80	Galois representations
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]
11G32	Dessins d'enfants, Belyĭ theory
11G35	Varieties over global fields [See also 14G25]
11G40	L-functions of varieties over global fields; Birch-Swinnerton-Dyer conjecture [See also 14G10]
11G42	Arithmetic mirror symmetry [See also 14J33]
11G45	Geometric class field theory [See also 11R37, 14C35, 19F05]
11G50	Heights [See also 14G40, 37P30]
11G55	Polylogarithms and relations with K-theory
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
11H71	Relations with coding theory
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
11J87	Schmidt Subspace Theorem and applications
11J89	Transcendence theory of elliptic and abelian functions
11J91	Transcendence theory of other special functions
11J93	Transcendence theory of Drinfel′d and t-modules
11J95	Results involving abelian varieties
11J97	Analogues of methods in Nevanlinna theory (work of Vojta et al.)
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, Pisot numbers, Salem numbers, good lattice points, 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
11M32	Multiple Dirichlet series and zeta functions and multizeta values
11M35	Hurwitz and Lerch zeta functions
11M36	Selberg zeta functions and regularized determinants; applications to spectral theory, Dirichlet series, Eisenstein series, etc. Explicit formulas
11M38	Zeta and L-functions in characteristic p
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]
11M50	Relations with random matrices
11M55	Relations with noncommutative geometry
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]
11P70 Inverse problems of additive number theory, including sumsets
11P81 Elementary theory of partitions [See also 05A17]
11P82 Analytic theory of partitions
11P83 Partitions; congruences and congruential restrictions
11P84 Partition identities; identities of Rogers-Ramanujan type
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; Mahler measure
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, 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, 16Hxx, 16Kxx]
11R56 Adèle rings and groups
11R58 Arithmetic theory of algebraic function fields [See also 14–XX]
11R60 Cyclotomic function fields (class groups, Bernoulli objects, etc.)
11R65 Class groups and Picard groups of orders
11R70 K-theory of global fields [See also 19Fxx]
11R80 Totally real 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, 16Hxx, 16Kxx]
11S70 K-theory of local fields [See also 19Fxx]
11S80 Other analytic theory (analogues of beta and gamma functions, p-adic integration, etc.)
11S82 Non-Archimedean dynamical systems [See mainly 37Pxx]
11S85 Other nonanalytic theory
11S90 Prehomogeneous vector spaces
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
11T60 Finite upper half-planes
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
11Zxx **Miscellaneous applications of number theory**
11Z05 Miscellaneous applications of number theory
11Z99 None of the above, but in this section

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
12E30 Field arithmetic
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 (field theory)**
12G05 Galois cohomology [See also 14F22, 16Hxx, 16K50]
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 34Mxx]
12H25 p-adic differential equations [See also 11S80, 14G20]
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 [See also 13A18]
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

[MSC Source Date: Monday 21 December 2009 09:49]

12Yxx **Computational aspects of field theory and polynomials**
12Y05 Computational aspects of field theory and polynomials
12Y99 None of the above, but in this section

13-XX **COMMUTATIVE ALGEBRA**
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; factorizations [See also 13F15]
13A15 Ideals; multiplicative ideal theory
13A18 Valuations and their generalizations [See also 12J20]
13A30 Associated graded rings of ideals (Rees ring, form ring), analytic spread and related topics
13A35 Characteristic p methods (Frobenius endomorphism) and reduction to characteristic p; tight closure [See also 13B22]
13A50 Actions of groups on commutative rings; invariant theory [See also 14L24]
13A99 None of the above, but in this section
13Bxx **Ring extensions and related topics**
13B02 Extension theory
13B05 Galois theory
13B10 Morphisms
13B21 Integral dependence; going up, going down
13B22 Integral closure of rings and ideals [See also 13A35]; integrally closed rings, related rings (Japanese, etc.)
13B25 Polynomials over commutative rings [See also 11C08, 11T06, 13F20, 13M10]
13B30 Rings of fractions and localization [See also 16S85]
13B35 Completion [See also 13J10]
13B40 Étale and flat extensions; Henselization; Artin approximation [See also 13J15, 14B12, 14B25]
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 19A13]
13C11 Injective and flat modules and ideals
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 [See also 11R29]
13C40 Linkage, complete intersections and determinantal ideals [See also 14M06, 14M10, 14M12]
13C60 Module categories
13C99 None of the above, but in this section
13Dxx **Homological methods {For noncommutative rings, see 16Exx; for general categories, see 18Gxx}**
13D02 Syzygies, resolutions, complexes
13D03 (Co)homology of commutative rings and algebras (e.g., Hochschild, André-Quillen, cyclic, dihedral, etc.)
13D05 Homological dimension
13D07 Homological functors on modules (Tor, Ext, etc.)
13D09 Derived categories
13D10 Deformations and infinitesimal methods [See also 14B10, 14B12, 14D15, 32Gxx]
13D15 Grothendieck groups, K-theory [See also 14C35, 18F30, 19Axx, 19D50]
13D22 Homological conjectures (intersection theorems)
13D30 Torsion theory [See also 13C12, 18E40]
13D40 Hilbert-Samuel and Hilbert-Kunz functions; 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; number of generators
13E99 None of the above, but in this section
13Fxx **Arithmetic rings and other special rings**
13F05 Dedekind, Prüfer, Krull and Mori rings and their generalizations
13F07 Euclidean rings and generalizations
13F10 Principal ideal rings

13F15 Rings defined by factorization properties (e.g., atomic, factorial, half-factorial) [See also 13A05, 14M05]
13F20 Polynomial rings and ideals; rings of integer-valued polynomials [See also 11C08, 13B25]
13F25 Formal power series rings [See also 13J05]
13F30 Valuation rings [See also 13A18]
13F35 Witt vectors and related rings
13F40 Excellent rings
13F45 Seminormal rings
13F50 Rings with straightening laws, Hodge algebras
13F55 Stanley-Reisner face rings; simplicial complexes [See also 55U10]
13F60 Cluster algebras
13F99 None of the above, but in this section
13Gxx **Integral domains**
13G05 Integral domains
13G99 None of the above, but in this section
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 [See also 14C17]
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]
13J30 Real algebra [See also 12D15, 14Pxx]
13J99 None of the above, but in this section
13Lxx **Applications of logic to commutative algebra [See also 03Cxx, 03Hxx]**
13L05 Applications of logic to commutative algebra [See also 03Cxx, 03Hxx]
13L99 None of the above, but in this section
13Mxx **Finite commutative rings {For number-theoretic aspects, see 11Txx}**
13M05 Structure
13M10 Polynomials
13M99 None of the above, but in this section
13Nxx **Differential algebra [See also 12H05, 14F10]**
13N05 Modules of differentials
13N10 Rings of differential operators and their modules [See also 16S32, 32C38]
13N15 Derivations
13N99 None of the above, but in this section
13Pxx **Computational aspects and applications [See also 14Qxx, 68W30]**
13P05 Polynomials, factorization [See also 12Y05]
13P10 Gröbner bases; other bases for ideals and modules (e.g., Janet and border bases)
13P15 Solving polynomial systems; resultants
13P20 Computational homological algebra [See also 13Dxx]
13P25 Applications of commutative algebra (e.g., to statistics, control theory, optimization, etc.)
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 and morphisms
14A15 Schemes and morphisms
14A20 Generalizations (algebraic spaces, stacks)
14A22 Noncommutative algebraic geometry [See also 16S38]
14A25 Elementary questions
14A99 None of the above, but in this section
14Bxx **Local theory**
14B05 Singularities [See also 14E15, 14H20, 14J17, 32Sxx, 58Kxx]
14B07 Deformations of singularities [See also 14D15, 32S30]
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
14B25 Local structure of morphisms: étale, flat, etc. [See also 13B40]

14B99 None of the above, but in this section
14Cxx **Cycles and subschemes**
14C05 Parametrization (Chow and Hilbert schemes)
14C15 (Equivariant) Chow groups and rings; motives
14C17 Intersection theory, characteristic classes, intersection multiplicities [See also 13H15]
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 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, monodromy, etc.)
14D06 Fibrations, degenerations
14D07 Variation of Hodge structures [See also 32G20]
14D10 Arithmetic ground fields (finite, local, global)
14D15 Formal methods; deformations [See also 13D10, 14B07, 32Gxx]
14D20 Algebraic moduli problems, moduli of vector bundles {For analytic moduli problems, see 32G13}
14D21 Applications of vector bundles and moduli spaces in mathematical physics (twistor theory, instantons, quantum field theory) [See also 32L25, 81Txx]
14D22 Fine and coarse moduli spaces
14D23 Stacks and moduli problems
14D24 Geometric Langlands program: algebro-geometric aspects [See also 22E57]
14D99 None of the above, but in this section
14Exx **Birational geometry**
14E05 Rational and birational maps
14E07 Birational automorphisms, Cremona group and generalizations
14E08 Rationality questions [See also 14M20]
14E15 Global theory and resolution of singularities [See also 14B05, 32S20, 32S45]
14E16 McKay correspondence
14E18 Arcs and motivic integration
14E20 Coverings [See also 14H30]
14E22 Ramification problems [See also 11S15]
14E25 Embeddings
14E30 Minimal model program (Mori theory, extremal rays)
14E99 None of the above, but in this section
14Fxx **(Co)homology theory [See also 13Dxx]**
14F05 Sheaves, derived categories of sheaves and related constructions [See also 14H60, 14J60, 18F20, 32Lxx, 46M20]
14F10 Differentials and other special sheaves; D-modules; Bernstein-Sato ideals and polynomials [See also 13Nxx, 32C38]
14F17 Vanishing theorems [See also 32L20]
14F18 Multiplier ideals
14F20 Étale and other Grothendieck topologies and (co)homologies
14F22 Brauer groups of schemes [See also 12G05, 16K50]
14F25 Classical real and complex (co)homology
14F30 p-adic cohomology, crystalline cohomology
14F35 Homotopy theory; fundamental groups [See also 14H30]
14F40 de Rham cohomology [See also 14C30, 32C35, 32L10]
14F42 Motivic cohomology; motivic homotopy theory [See also 19E15]
14F43 Other algebro-geometric (co)homologies (e.g., intersection, equivariant, Lawson, Deligne (co)homologies)
14F45 Topological properties
14F99 None of the above, but in this section
14Gxx **Arithmetic problems. Diophantine geometry [See also 11Dxx, 11Gxx]**
14G05 Rational points
14G10 Zeta-functions and related questions [See also 11G40] (Birch-Swinnerton-Dyer conjecture)
14G15 Finite ground fields
14G17 Positive characteristic ground fields
14G20 Local ground fields
14G22 Rigid analytic geometry
14G25 Global ground fields
14G27 Other nonalgebraically closed ground fields
14G32 Universal profinite groups (relationship to moduli spaces, projective and moduli towers, Galois theory)
14G35 Modular and Shimura varieties [See also 11F41, 11F46, 11G18]
14G40 Arithmetic varieties and schemes; Arakelov theory; heights [See also 11G50, 37P30]
14G50 Applications to coding theory and cryptography [See also 94A60, 94B27, 94B40]

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, 32G15]
14H20 Singularities, local rings [See also 13Hxx, 14B05]
14H25 Arithmetic ground fields [See also 11Dxx, 11G05, 14Gxx]
14H30 Coverings, fundamental group [See also 14E20, 14F35]
14H37 Automorphisms
14H40 Jacobians, Prym varieties [See also 32G20]
14H42 Theta functions; Schottky problem [See also 14K25, 32G20]
14H45 Special curves and curves of low genus
14H50 Plane and space curves
14H51 Special divisors (gonality, Brill-Noether theory)
14H52 Elliptic curves [See also 11G05, 11G07, 14Kxx]
14H55 Riemann surfaces; Weierstrass points; gap sequences [See also 30Fxx]
14H57 Dessins d'enfants theory {For arithmetic aspects, see 11G32}
14H60 Vector bundles on curves and their moduli [See also 14D20, 14F05]
14H70 Relationships with integrable systems
14H81 Relationships with physics
14H99 None of the above, but in this section
14Jxx **Surfaces and higher-dimensional varieties {For analytic theory, see 32Jxx}**
14J10 Families, moduli, classification: algebraic theory
14J15 Moduli, classification: analytic theory; relations with modular forms [See also 32G13]
14J17 Singularities [See also 14B05, 14E15]
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 3-folds [See also 32Q25]
14J32 Calabi-Yau manifolds
14J33 Mirror symmetry [See also 11G42, 53D37]
14J35 4-folds
14J40 n-folds ($n > 4$)
14J45 Fano varieties
14J50 Automorphisms of surfaces and higher-dimensional varieties
14J60 Vector bundles on surfaces and higher-dimensional varieties, and their moduli [See also 14D20, 14F05, 32Lxx]
14J70 Hypersurfaces
14J80 Topology of surfaces (Donaldson polynomials, Seiberg-Witten invariants)
14J81 Relationships with physics
14J99 None of the above, but in this section
14Kxx **Abelian varieties and schemes**
14K02 Isogeny
14K05 Algebraic theory
14K10 Algebraic moduli, classification [See also 11G15]
14K12 Subvarieties
14K15 Arithmetic ground fields [See also 11Dxx, 11Fxx, 11G10, 14Gxx]
14K20 Analytic theory; abelian integrals and differentials
14K22 Complex multiplication [See also 11G15]
14K25 Theta functions [See also 14H42]
14K30 Picard schemes, higher Jacobians [See also 14H40, 32G20]
14K99 None of the above, but in this section
14Lxx **Algebraic groups {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]
14L24 Geometric invariant theory [See also 13A50]
14L30 Group actions on varieties or schemes (quotients) [See also 13A50, 14L24, 14M17]
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 13F15, 13F45, 13H10]
14M06 Linkage [See also 13C40]
14M07 Low codimension problems
14M10 Complete intersections [See also 13C40]
14M12 Determinantal varieties [See also 13C40]
14M15 Grassmannians, Schubert varieties, flag manifolds [See also 32M10, 51M35]

[MSC Source Date: Monday 21 December 2009 09:49]

14M17 Homogeneous spaces and generalizations [See also 32M10, 53C30, 57T15]
14M20 Rational and unirational varieties [See also 14E08]
14M22 Rationally connected varieties
14M25 Toric varieties, Newton polyhedra [See also 52B20]
14M27 Compactifications; symmetric and spherical varieties
14M30 Supervarieties [See also 32C11, 58A50]
14M99 None of the above, but in this section
14Nxx **Projective and enumerative geometry [See also 51–XX]**
14N05 Projective techniques [See also 51N35]
14N10 Enumerative problems (combinatorial problems)
14N15 Classical problems, Schubert calculus
14N20 Configurations and arrangements of linear subspaces
14N25 Varieties of low degree
14N30 Adjunction problems
14N35 Gromov-Witten invariants, quantum cohomology, Gopakumar-Vafa invariants, Donaldson-Thomas invariants [See also 53D45]
14N99 None of the above, but in this section
14Pxx **Real algebraic and real analytic geometry**
14P05 Real algebraic sets [See also 12D15, 13J30]
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 12Y05, 13Pxx, 68W30]**
14Q05 Curves
14Q10 Surfaces, hypersurfaces
14Q15 Higher-dimensional varieties
14Q20 Effectivity, complexity
14Q99 None of the above, but in this section
14Rxx **Affine geometry**
14R05 Classification of affine varieties
14R10 Affine spaces (automorphisms, embeddings, exotic structures, cancellation problem)
14R15 Jacobian problem [See also 13F20]
14R20 Group actions on affine varieties [See also 13A50, 14L30]
14R25 Affine fibrations [See also 14D06]
14R99 None of the above, but in this section
14Txx **Tropical geometry [See also 12K10, 14M25, 14N10, 52B20]**
14T05 Tropical geometry [See also 12K10, 14M25, 14N10, 52B20]
14T99 None of the above, but in this section

15–XX **LINEAR AND MULTILINEAR ALGEBRA; MATRIX THEORY**
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.
15Axx **Basic linear algebra**
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]
15A16 Matrix exponential and similar functions of matrices
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
15A29 Inverse problems
15A30 Algebraic systems of matrices [See also 16S50, 20Gxx, 20Hxx]
15A39 Linear inequalities
15A42 Inequalities involving eigenvalues and eigenvectors
15A45 Miscellaneous inequalities involving matrices
15A54 Matrices over function rings in one or more variables
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, 14L24]
15A75 Exterior algebra, Grassmann algebras
15A78 Other algebras built from modules
15A80 Max-plus and related algebras
15A83 Matrix completion problems
15A86 Linear preserver problems
15A99 Miscellaneous topics
15Bxx **Special matrices**
15B05 Toeplitz, Cauchy, and related matrices
15B10 Orthogonal matrices
15B15 Fuzzy matrices
15B33 Matrices over special rings (quaternions, finite fields, etc.)
15B34 Boolean and Hadamard matrices
15B35 Sign pattern matrices
15B36 Matrices of integers [See also 11C20]
15B48 Positive matrices and their generalizations; cones of matrices
15B51 Stochastic matrices
15B52 Random matrices
15B57 Hermitian, skew-Hermitian, and related matrices
15B99 None of the above, but in this section

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) [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
16D20 Bimodules
16D25 Ideals
16D30 Infinite-dimensional simple rings (except as in 16Kxx)
16D40 Free, projective, and flat modules and ideals [See also 19A13]
16D50 Injective modules, self-injective rings [See also 16L60]
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 16G50]
16D90 Module categories [See also 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 {For commutative rings, see 13Dxx; for general categories, see 18Gxx}**
16E05 Syzygies, resolutions, complexes
16E10 Homological dimension
16E20 Grothendieck groups, K-theory, etc. [See also 18F30, 19Axx, 19D50]
16E30 Homological functors on modules (Tor, Ext, etc.)
16E35 Derived categories
16E40 (Co)homology of rings and algebras (e.g. Hochschild, cyclic, dihedral, etc.)
16E45 Differential graded algebras and applications
16E50 von Neumann regular rings and generalizations
16E60 Semihereditary and hereditary rings, free ideal rings, Sylvester rings, etc.
16E65 Homological conditions on rings (generalizations of regular, Gorenstein, Cohen-Macaulay rings, etc.)
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 16Hxx]
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

16Hxx	**Algebras and orders** {**For arithmetic aspects, see 11R52, 11R54, 11S45; for representation theory, see 16G30**}
16H05	Separable algebras (e.g., quaternion algebras, Azumaya algebras, etc.)
16H10	Orders in separable algebras
16H15	Commutative orders
16H20	Lattices over orders
16H99	None of the above, but in this section
16Kxx	**Division rings and semisimple Artin rings** [See also 12E15, 15A30]
16K20	Finite-dimensional {For crossed products, see 16S35}
16K40	Infinite-dimensional and general
16K50	Brauer groups [See also 12G05, 14F22]
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 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, Gelfand-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)
16R60	Functional identities
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]
16S37	Quadratic and Koszul algebras
16S38	Rings arising from non-commutative algebraic geometry [See also 14A22]
16S40	Smash products of general Hopf actions [See also 16T05]
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 13D10, 14D15]
16S85	Rings of fractions and localizations [See also 13B30]
16S90	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
16Txx	**Hopf algebras, quantum groups and related topics**
16T05	Hopf algebras and their applications [See also 16S40, 57T05]
16T10	Bialgebras
16T15	Coalgebras and comodules; corings
16T20	Ring-theoretic aspects of quantum groups [See also 17B37, 20G42, 81R50]
16T25	Yang-Baxter equations
16T30	Connections with combinatorics
16T99	None of the above, but in this section

16Uxx	**Conditions on elements**
16U10	Integral domains
16U20	Ore rings, multiplicative sets, Ore localization
16U30	Divisibility, noncommutative UFDs
16U60	Units, groups of units
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
16W22	Actions of groups and semigroups; invariant theory
16W25	Derivations, actions of Lie algebras
16W50	Graded rings and modules
16W55	"Super" (or "skew") structure [See also 17A70, 17Bxx, 17C70] {For exterior algebras, see 15A75; for Clifford algebras, see 11E88, 15A66}
16W60	Valuations, completions, formal power series and related constructions [See also 13Jxx]
16W70	Filtered rings; filtrational and graded techniques
16W80	Topological and ordered rings and modules [See also 06F25, 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
16Zxx	**Computational aspects of associative rings**
16Z05	Computational aspects of associative rings [See also 68W30]
16Z99	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 rings
17A15	Noncommutative Jordan algebras
17A20	Flexible algebras
17A30	Algebras satisfying other identities
17A32	Leibniz algebras
17A35	Division algebras
17A36	Automorphisms, derivations, other operators
17A40	Ternary compositions
17A42	Other n-ary compositions ($n \geq 3$)
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 (super)algebras
17B05	Structure theory
17B08	Coadjoint orbits; nilpotent varieties
17B10	Representations, algebraic theory (weights)
17B15	Representations, analytic theory
17B20	Simple, semisimple, reductive (super)algebras
17B22	Root systems
17B25	Exceptional (super)algebras
17B30	Solvable, nilpotent (super)algebras
17B35	Universal enveloping (super)algebras [See also 16S30]
17B37	Quantum groups (quantized enveloping algebras) and related deformations [See also 16T20, 20G42, 81R50, 82B23]
17B40	Automorphisms, derivations, other operators
17B45	Lie algebras of linear algebraic groups [See also 14Lxx and 20Gxx]
17B50	Modular Lie (super)algebras
17B55	Homological methods in Lie (super)algebras
17B56	Cohomology of Lie (super)algebras
17B60	Lie (super)algebras associated with other structures (associative, Jordan, etc.) [See also 16W10, 17C40, 17C50]
17B62	Lie bialgebras; Lie coalgebras

[MSC Source Date: Monday 21 December 2009 09:49]

17B63   Poisson algebras
17B65   Infinite-dimensional Lie (super)algebras [See also 22E65]
17B66   Lie algebras of vector fields and related (super) algebras
17B67   Kac-Moody (super)algebras; extended affine Lie algebras; toroidal Lie algebras
17B68   Virasoro and related algebras
17B69   Vertex operators; vertex operator algebras and related structures
17B70   Graded Lie (super)algebras
17B75   Color Lie (super)algebras
17B80   Applications to integrable systems
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 {For commutative rings see 13Dxx, for associative rings 16Exx, for groups 20Jxx, for topological groups and related structures 57Txx; see also 55Nxx and 55Uxx for algebraic topology}**
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 [See especially 20L05]
18A15   Foundations, relations to logic and deductive systems [See also 03–XX]
18A20   Epimorphisms, monomorphisms, special classes of morphisms, null morphisms
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, substructures, quotient structures, congruences, amalgams
18A35   Categories admitting limits (complete categories), functors preserving limits, completions
18A40   Adjoint functors (universal constructions, reflective subcategories, 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, 20L05, 20Mxx]
18B99   None of the above, but in this section
18Cxx   **Categories and 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
18C30   Sketches and generalizations
18C35   Accessible and locally presentable categories
18C50   Categorical semantics of formal languages [See also 68Q55, 68Q65]
18C99   None of the above, but in this section
18Dxx   **Categories with structure**
18D05   Double categories, 2-categories, bicategories and generalizations
18D10   Monoidal categories (= multiplicative categories), symmetric monoidal categories, braided 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.)
18D50   Operads [See also 55P48]
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, 20Jxx, 55Nxx, 55Uxx, 57Txx]**
18G05   Projectives and injectives [See also 13C10, 13C11, 16D40, 16D50]
18G10   Resolutions; derived functors [See also 13D02, 16E05, 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   Homotopical algebra
18G60   Other (co)homology theories [See also 19D55, 46L80, 58J20, 58J22]
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

[MSC Source Date: Monday 21 December 2009 09:49]

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 and motivic cohomology [See also 14C25, 14C35, 14F42]
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 58J22]
19K56 Index theory [See also 58J20, 58J22]
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]
19L50 Twisted K-theory; differential K-theory
19L64 Computations, geometric applications
19L99 None of the above, but in this section
19Mxx **Miscellaneous applications of K-theory**
19M05 Miscellaneous applications of K-theory
19M99 None of the above, but in this section

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]
20C08 Hecke algebras and their representations
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 Finite simple groups and their classification
20D06 Simple groups: alternating groups and groups of Lie type [See also 20Gxx]
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
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; subgroup growth
20E08 Groups acting on trees [See also 20F65]
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; residually finite groups
20E28 Maximal subgroups
20E32 Simple groups [See also 20D05]
20E34 General structure theorems
20E36 Automorphisms of infinite groups [For automorphisms of finite groups, see 20D45]
20E42 Groups with a BN-pair; buildings [See also 51E24]
20E45 Conjugacy classes
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, 20M05, 68Q70]
20F11 Groups of finite Morley rank [See also 03C45, 03C60]
20F12 Commutator calculus
20F14 Derived series, central series, and generalizations
20F16 Solvable groups, supersolvable groups [See also 20D10]

20F17	Formations of groups, Fitting classes [See also 20D10]
20F18	Nilpotent groups [See also 20D15]
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
20F34	Fundamental groups and their automorphisms [See also 57M05, 57Sxx]
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	Reflection and Coxeter groups [See also 22E40, 51F15]
20F60	Ordered groups [See mainly 06F15]
20F65	Geometric group theory [See also 05C25, 20E08, 57Mxx]
20F67	Hyperbolic groups and nonpositively curved groups
20F69	Asymptotic properties of groups
20F70	Algebraic geometry over groups; equations over groups
20F99	None of the above, but in this section
20Gxx	**Linear algebraic groups and related topics {For arithmetic theory, see 11E57, 11H56; for geometric theory, see 14Lxx, 22Exx; for other methods in representation theory, see 15A30, 22E45, 22E46, 22E47, 22E50, 22E55}**
20G05	Representation theory
20G07	Structure 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
20G41	Exceptional groups
20G42	Quantum groups (quantized function algebras) and their representations [See also 16T20, 17B37, 81R50]
20G43	Schur and q-Schur algebras
20G44	Kac-Moody groups
20G45	Applications to physics
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 groups
20J15	Category of groups
20J99	None of the above, but in this section
20Kxx	**Abelian groups**
20K01	Finite abelian groups [For sumsets, see 11B13 and 11P70]
20K10	Torsion groups, primary groups and generalized primary groups
20K15	Torsion-free groups, finite rank
20K20	Torsion-free groups, infinite rank
20K21	Mixed groups
20K25	Direct sums, direct products, etc.
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	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}
20L99	None of the above, but in this section

20Mxx	**Semigroups**
20M05	Free semigroups, generators and relations, word problems [See also 03D40, 08A50, 20F10]
20M07	Varieties and pseudovarieties of semigroups
20M10	General structure theory
20M11	Radical theory
20M12	Ideal theory
20M13	Arithmetic theory of monoids
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; actions of semigroups on sets
20M32	Algebraic monoids
20M35	Semigroups in automata theory, linguistics, etc. [See also 03D05, 68Q70, 68T50]
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]
20N10	Ternary systems (heaps, semiheaps, heapoids, etc.)
20N15	n-ary systems ($n \geq 3$)
20N20	Hypergroups
20N25	Fuzzy groups [See also 03E72]
20N99	None of the above, but in this section
20Pxx	**Probabilistic methods in group theory [See also 60Bxx]**
20P05	Probabilistic methods in group theory [See also 60Bxx]
20P99	None of the above, but in this section
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}**
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) [See also 58H05]
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
22Cxx	**Compact groups**
22C05	Compact groups
22C99	None of the above, but in this section
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 in relation to group representations [See also 46Lxx]
22D30	Induced representations
22D35	Duality theorems
22D40	Ergodic theory on groups [See also 28Dxx]
22D45	Automorphism groups of locally compact groups
22D99	None of the above, but in this section

[MSC Source Date: Monday 21 December 2009 09:49]

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
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 17B10]
22E50 Representations of Lie and linear algebraic groups over local fields [See also 20G05]
22E55 Representations of Lie and linear algebraic groups over global fields and adèle rings [See also 20G05]
22E57 Geometric Langlands program: representation-theoretic aspects [See also 14D24]
22E60 Lie algebras of Lie groups {For the algebraic theory of Lie algebras, see 17Bxx}
22E65 Infinite-dimensional Lie groups and their Lie algebras: general properties [See also 17B65, 58B25, 58H05]
22E66 Analysis on and representations of infinite-dimensional Lie groups
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
22Fxx Noncompact transformation groups
22F05 General theory of group and pseudogroup actions {For topological properties of spaces with an action, see 57S20}
22F10 Measurable group actions [See also 22D40, 28Dxx, 37Axx]
22F30 Homogeneous spaces {For general actions on manifolds or preserving geometrical structures, see 57M60, 57Sxx; for discrete subgroups of Lie groups, see especially 22E40}
22F50 Groups as automorphisms of other structures
22F99 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 37Bxx, 37Cxx, 37Exx, 39B12, 47H10, 54H25]
26A21 Classification of real functions; Baire classification of sets and functions [See also 03E15, 28A05, 54C50, 54H05]
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, 49J53, 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]
26E50 Fuzzy real analysis [See also 03E72, 28E10]
26E60 Means [See also 47A64]
26E70 Real analysis on time scales or measure chains {For dynamic equations on time scales or measure chains see 34N05}
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, 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 and packing measures
28A80 Fractals [See also 37Fxx]

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, 91B14]
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 or semigroups, 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, 37Axx, 47A35, 54H20, 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 03E72, 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 $\mathbf{R}^n$, 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 34Mxx, 37Fxx, 39–XX]
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
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 (pseudoanalytic, 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
30Hxx	**Spaces and algebras of analytic functions**
30H05	Bounded analytic functions
30H10	Hardy spaces
30H15	Nevanlinna class and Smirnov class
30H20	Bergman spaces, Fock spaces
30H25	Besov spaces and Q_p-spaces
30H30	Bloch spaces
30H35	BMO-spaces
30H50	Algebras of analytic functions
30H80	Corona theorems
30H99	None of the above, but in this section
30Jxx	**Function theory on the disc**
30J05	Inner functions
30J10	Blaschke products
30J15	Singular inner functions
30J99	None of the above, but in this section
30Kxx	**Universal holomorphic functions**
30K05	Universal Taylor series
30K10	Universal Dirichlet series
30K15	Bounded universal functions
30K20	Compositional universality
30K99	None of the above, but in this section
30Lxx	**Analysis on metric spaces**
30L05	Geometric embeddings of metric spaces
30L10	Quasiconformal mappings in metric spaces
30L99	None of the above, but in this section

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 32U05]

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

31Dxx **Axiomatic potential theory**

31D05 Axiomatic potential theory

31D99 None of the above, but in this section

31Exx **Potential theory on metric spaces**

31E05 Potential theory on metric spaces

31E99 None of the above, but in this section

32–XX **SEVERAL COMPLEX VARIABLES AND ANALYTIC SPACES** {**For infinite-dimensional holomorphy, see 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, circular, tube)

32A10 Holomorphic functions

32A12 Multifunctions

32A15 Entire functions

32A17 Special families of functions

32A18 Bloch functions, normal functions

32A19 Normal families of functions, mappings

32A20 Meromorphic functions

32A22 Nevanlinna theory (local); growth estimates; other inequalities {For geometric theory, see 32H25, 32H30}

32A25 Integral representations; canonical kernels (Szegő, Bergman, etc.)

32A26 Integral representations, constructed kernels (e.g. Cauchy, Fantappiè-type kernels)

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, Nevanlinna spaces [See also 32M15, 42B30, 43A85, 46J15]

32A36 Bergman spaces

32A37 Other spaces of holomorphic functions (e.g. bounded mean oscillation (BMOA), vanishing mean oscillation (VMOA)) [See also 46Exx]

32A38 Algebras of holomorphic functions [See also 30H05, 46J10, 46J15]

32A40 Boundary behavior of holomorphic functions

32A45 Hyperfunctions [See also 46F15]

32A50 Harmonic analysis of several complex variables [See mainly 43–XX]

32A55 Singular integrals

32A60 Zero sets of holomorphic functions

32A65 Banach algebra techniques [See mainly 46Jxx]

32A70 Functional analysis techniques [See mainly 46Exx]

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, local parametrization

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 **Analytic spaces**

32C05 Real-analytic manifolds, real-analytic spaces [See also 14Pxx, 58A07]

32C07 Real-analytic sets, complex Nash functions [See also 14P15, 14P20]

32C09 Embedding of real analytic manifolds

32C11 Complex supergeometry [See also 14A22, 14M30, 58A50]

32C15 Complex spaces

32C18 Topology of analytic spaces

32C20 Normal analytic spaces

32C22 Embedding of 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, D-modules [See also 14F10, 16S32, 35A27, 58J15]

32C55 The Levi problem in complex spaces; generalizations

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

32D26 Riemann domains

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

32E30 Holomorphic and polynomial approximation, Runge pairs, interpolation

32E35 Global boundary behavior of holomorphic functions

32E40 The Levi problem

32E99 None of the above, but in this section

32Fxx **Geometric convexity**

32F10 q-convexity, q-concavity

32F17 Other notions of convexity

32F18 Finite-type conditions

32F27 Topological consequences of geometric convexity

32F32 Analytical consequences of geometric convexity (vanishing theorems, etc.)

32F45 Invariant metrics and pseudodistances

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 (e.g. Knizhnik-Zamolodchikov equation) [See also 34Mxx]

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

32H12   Boundary uniqueness of mappings

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 mappings

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

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 from Section 32 describing the type of problem)**

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 bundles and generalizations

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 [See also 53C28]

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 acting on 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, Jordan algebras [See also 22E10, 22E40, 53C35, 57T15]

32M17   Automorphism groups of $\mathbf{C}^n$ and affine manifolds

32M25   Complex vector fields

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

32Pxx   **Non-Archimedean analysis (should also be assigned at least one other classification number from Section 32 describing the type of problem)**

32P05   Non-Archimedean analysis (should also be assigned at least one other classification number from Section 32 describing the type of problem)

32P99   None of the above, but in this section

32Qxx   **Complex manifolds**

32Q05   Negative curvature manifolds

32Q10   Positive curvature manifolds

32Q15   Kähler manifolds

32Q20   Kähler-Einstein manifolds [See also 53Cxx]

32Q25   Calabi-Yau theory [See also 14J30]

32Q26   Notions of stability

32Q28   Stein manifolds

32Q30   Uniformization

32Q35   Complex manifolds as subdomains of Euclidean space

32Q40   Embedding theorems

32Q45   Hyperbolic and Kobayashi hyperbolic manifolds

32Q55   Topological aspects of complex manifolds

32Q57   Classification theorems

32Q60   Almost complex manifolds

32Q65   Pseudoholomorphic curves

32Q99   None of the above, but in this section

32Sxx   **Singularities [See also 58Kxx]**

32S05   Local singularities [See also 14J17]

32S10   Invariants of analytic local rings

32S15   Equisingularity (topological and analytic) [See also 14E15]

32S20   Global theory of singularities; cohomological properties [See also 14E15]

32S22   Relations with arrangements of hyperplanes [See also 52C35]

32S25   Surface and hypersurface 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 58Kxx]

32S65   Singularities of holomorphic vector fields and foliations

32S70   Other operations on singularities

32S99   None of the above, but in this section

32Txx   **Pseudoconvex domains**

32T05   Domains of holomorphy

32T15   Strongly pseudoconvex domains

32T20   Worm domains

32T25   Finite type domains

32T27   Geometric and analytic invariants on weakly pseudoconvex boundaries

32T35   Exhaustion functions

32T40   Peak functions

32T99   None of the above, but in this section

32Uxx   **Pluripotential theory**

32U05   Plurisubharmonic functions and generalizations [See also 31C10]

32U10   Plurisubharmonic exhaustion functions

32U15   General pluripotential theory

32U20   Capacity theory and generalizations

32U25   Lelong numbers

32U30   Removable sets

32U35   Pluricomplex Green functions

32U40   Currents

32U99   None of the above, but in this section

32Vxx   **CR manifolds**

32V05   CR structures, CR operators, and generalizations

32V10   CR functions

32V15   CR manifolds as boundaries of domains

32V20   Analysis on CR manifolds

32V25   Extension of functions and other analytic objects from CR manifolds

32V30   Embeddings of CR manifolds

32V35   Finite type conditions on CR manifolds

32V40   Real submanifolds in complex manifolds

32V99   None of the above, but in this section

32Wxx   **Differential operators in several variables**

32W05 $\overline{\partial}$ and $\overline{\partial}$-Neumann operators

32W10 $\overline{\partial}_b$ and $\overline{\partial}_b$-Neumann operators

32W20   Complex Monge-Ampère operators

32W25   Pseudodifferential operators in several complex variables

32W30   Heat kernels in several complex variables

32W50   Other partial differential equations of complex analysis

32W99   None of the above, but in this section

33-XX   **SPECIAL FUNCTIONS (33-XX DEALS WITH THE PROPERTIES OF FUNCTIONS AS FUNCTIONS) {For orthogonal functions, see 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.

[MSC Source Date: Monday 21 December 2009 09:49]

33Bxx **Elementary classical functions**
33B10 Exponential and trigonometric functions
33B15 Gamma, beta and polygamma functions
33B20 Incomplete beta and gamma functions (error functions, probability integral, Fresnel integrals)
33B30 Higher logarithm functions
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 of hypergeometric type (Jacobi, Laguerre, Hermite, Askey scheme, etc.) [See also 42C05 for general orthogonal polynomials and functions]
33C47 Other special orthogonal polynomials and functions
33C50 Orthogonal polynomials and functions in several variables expressible in terms of special functions in one variable
33C52 Orthogonal polynomials and functions associated with root systems
33C55 Spherical harmonics
33C60 Hypergeometric integrals and functions defined by them (E, G, H and I functions)
33C65 Appell, Horn and Lauricella functions
33C67 Hypergeometric functions associated with root systems
33C70 Other hypergeometric functions and integrals in several variables
33C75 Elliptic integrals as hypergeometric functions
33C80 Connections with groups and algebras, 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
33D15 Basic hypergeometric functions in one variable, $_r\varphi_s$
33D45 Basic orthogonal polynomials and functions (Askey-Wilson polynomials, etc.)
33D50 Orthogonal polynomials and functions in several variables expressible in terms of basic hypergeometric functions in one variable
33D52 Basic orthogonal polynomials and functions associated with root systems (Macdonald polynomials, etc.)
33D60 Basic hypergeometric integrals and functions defined by them
33D65 Bibasic functions and multiple bases
33D67 Basic hypergeometric functions associated with root systems
33D70 Other basic hypergeometric functions and integrals in several variables
33D80 Connections with quantum groups, Chevalley groups, p-adic groups, Hecke 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
33E12 Mittag-Leffler functions and generalizations
33E15 Other wave functions
33E17 Painlevé-type functions
33E20 Other functions defined by series and integrals
33E30 Other functions coming from differential, difference and integral equations
33E50 Special functions in characteristic p (gamma functions, etc.)
33E99 None of the above, but in this section
33Fxx **Computational aspects**
33F05 Numerical approximation and evaluation [See also 65D20]
33F10 Symbolic computation (Gosper and Zeilberger algorithms, etc.) [See also 68W30]
33F99 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
34A07 Fuzzy differential equations
34A08 Fractional differential equations
34A09 Implicit equations, differential-algebraic equations [See also 65L80]
34A12 Initial value problems, existence, uniqueness, continuous dependence and continuation of solutions

34A25 Analytical theory: series, transformations, transforms, operational calculus, etc. [See also 44–XX]
34A26 Geometric methods in differential equations
34A30 Linear equations and systems, general
34A33 Lattice differential equations
34A34 Nonlinear equations and systems, general
34A35 Differential equations of infinite order
34A36 Discontinuous equations
34A37 Differential equations with impulses
34A38 Hybrid systems
34A40 Differential inequalities [See also 26D20]
34A45 Theoretical approximation of solutions {For numerical analysis, see 65Lxx}
34A55 Inverse problems
34A60 Differential inclusions [See also 49J21, 49K21]
34A99 None of the above, but in this section
34Bxx **Boundary value problems {For ordinary differential operators, see 34Lxx}**
34B05 Linear boundary value problems
34B07 Linear boundary value problems with nonlinear dependence on the spectral parameter
34B08 Parameter dependent boundary value problems
34B09 Boundary eigenvalue problems
34B10 Nonlocal and multipoint boundary value problems
34B15 Nonlinear boundary value problems
34B16 Singular nonlinear boundary value problems
34B18 Positive solutions of 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.)
34B37 Boundary value problems with impulses
34B40 Boundary value problems on infinite intervals
34B45 Boundary value problems on graphs and networks
34B60 Applications
34B99 None of the above, but in this section
34Cxx **Qualitative theory [See also 37–XX]**
34C05 Location of integral curves, singular points, limit cycles
34C07 Theory of limit cycles of polynomial and analytic vector fields (existence, uniqueness, bounds, Hilbert's 16th problem and ramifications)
34C08 Connections with real algebraic geometry (fewnomials, desingularization, zeros of Abelian integrals, etc.)
34C10 Oscillation theory, zeros, disconjugacy and comparison theory
34C11 Growth, boundedness
34C12 Monotone systems
34C14 Symmetries, invariants
34C15 Nonlinear oscillations, coupled oscillators
34C20 Transformation and reduction of equations and systems, normal forms
34C23 Bifurcation [See also 37Gxx]
34C25 Periodic solutions
34C26 Relaxation oscillations
34C27 Almost and pseudo-almost periodic solutions
34C28 Complex behavior, chaotic systems [See also 37Dxx]
34C29 Averaging method
34C37 Homoclinic and heteroclinic solutions
34C40 Equations and systems on manifolds
34C41 Equivalence, asymptotic equivalence
34C45 Invariant manifolds
34C46 Multifrequency systems
34C55 Hysteresis
34C60 Qualitative investigation and simulation of models
34C99 None of the above, but in this section
34Dxx **Stability theory [See also 37C75, 93Dxx]**
34D05 Asymptotic properties
34D06 Synchronization
34D08 Characteristic and Lyapunov exponents
34D09 Dichotomy, trichotomy
34D10 Perturbations
34D15 Singular perturbations
34D20 Stability
34D23 Global stability
34D30 Structural stability and analogous concepts [See also 37C20]
34D35 Stability of manifolds of solutions
34D45 Attractors [See also 37C70, 37D45]
34D99 None of the above, but in this section

[MSC Source Date: Monday 21 December 2009 09:49]

34Exx	**Asymptotic theory**
34E05	Asymptotic expansions
34E10	Perturbations, asymptotics
34E13	Multiple scale methods
34E15	Singular perturbations, general theory
34E17	Canard solutions
34E18	Methods of nonstandard analysis
34E20	Singular perturbations, turning point theory, WKB methods
34E99	None of the above, but in this section
34Fxx	**Equations and systems with randomness [See also 34K50, 60H10, 93E03]**
34F05	Equations and systems with randomness [See also 34K50, 60H10, 93E03]
34F10	Bifurcation
34F15	Resonance phenomena
34F99	None of the above, but in this section
34Gxx	**Differential equations in abstract spaces [See also 34Lxx, 37Kxx, 47Dxx, 47Hxx, 47Jxx, 58D25]**
34G10	Linear equations [See also 47D06, 47D09]
34G20	Nonlinear equations [See also 47Hxx, 47Jxx]
34G25	Evolution inclusions
34G99	None of the above, but in this section
34Hxx	**Control problems [See also 49J15, 49K15, 93C15]**
34H05	Control problems [See also 49J15, 49K15, 93C15]
34H10	Chaos control
34H15	Stabilization
34H20	Bifurcation control
34H99	None of the above, but in this section
34Kxx	**Functional-differential and differential-difference equations [See also 37–XX]**
34K05	General theory
34K06	Linear functional-differential equations
34K07	Theoretical approximation of solutions
34K08	Spectral theory of functional-differential operators
34K09	Functional-differential inclusions
34K10	Boundary value problems
34K11	Oscillation theory
34K12	Growth, boundedness, comparison of solutions
34K13	Periodic solutions
34K14	Almost and pseudo-periodic solutions
34K17	Transformation and reduction of equations and systems, normal forms
34K18	Bifurcation theory
34K19	Invariant manifolds
34K20	Stability theory
34K21	Stationary solutions
34K23	Complex (chaotic) behavior of solutions
34K25	Asymptotic theory
34K26	Singular perturbations
34K27	Perturbations
34K28	Numerical approximation of solutions
34K29	Inverse problems
34K30	Equations in abstract spaces [See also 34Gxx, 35R09, 35R10, 47Jxx]
34K31	Lattice functional-differential equations
34K32	Implicit equations
34K33	Averaging
34K34	Hybrid systems
34K35	Control problems [See also 49J21, 49K21, 93C23]
34K36	Fuzzy functional-differential equations
34K37	Functional-differential equations with fractional derivatives
34K38	Functional-differential inequalities
34K40	Neutral equations
34K45	Equations with impulses
34K50	Stochastic functional-differential equations [See also 60Hxx]
34K60	Qualitative investigation and simulation of models
34K99	None of the above, but in this section
34Lxx	**Ordinary differential operators [See also 47E05]**
34L05	General spectral theory
34L10	Eigenfunctions, eigenfunction expansions, completeness of eigenfunctions
34L15	Eigenvalues, estimation of eigenvalues, upper and lower bounds
34L16	Numerical approximation of eigenvalues and of other parts of the spectrum
34L20	Asymptotic distribution of eigenvalues, asymptotic theory of eigenfunctions
34L25	Scattering theory, inverse scattering
34L30	Nonlinear ordinary differential operators
34L40	Particular operators (Dirac, one-dimensional Schrödinger, etc.)
34L99	None of the above, but in this section

34Mxx	**Differential equations in the complex domain [See also 30Dxx, 32G34]**
34M03	Linear equations and systems
34M05	Entire and meromorphic solutions
34M10	Oscillation, growth of solutions
34M15	Algebraic aspects (differential-algebraic, hypertranscendence, group-theoretical)
34M25	Formal solutions, transform techniques
34M30	Asymptotics, summation methods
34M35	Singularities, monodromy, local behavior of solutions, normal forms
34M40	Stokes phenomena and connection problems (linear and nonlinear)
34M45	Differential equations on complex manifolds
34M50	Inverse problems (Riemann-Hilbert, inverse differential Galois, etc.)
34M55	Painlevé and other special equations; classification, hierarchies;
34M56	Isomonodromic deformations
34M60	Singular perturbation problems in the complex domain (complex WKB, turning points, steepest descent) [See also 34E20]
34M99	None of the above, but in this section
34Nxx	**Dynamic equations on time scales or measure chains {For real analysis on time scales see 26E70}**
34N05	Dynamic equations on time scales or measure chains {For real analysis on time scales or measure chains, see 26E70}
34N99	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 topics**
35A01	Existence problems: global existence, local existence, non-existence
35A02	Uniqueness problems: global uniqueness, local uniqueness, non-uniqueness
35A08	Fundamental solutions
35A09	Classical solutions
35A10	Cauchy-Kovalevskaya theorems
35A15	Variational methods
35A16	Topological and monotonicity methods
35A17	Parametrices
35A18	Wave front sets
35A20	Analytic methods, singularities
35A21	Propagation of singularities
35A22	Transform methods (e.g. integral transforms)
35A23	Inequalities involving derivatives and differential and integral operators, inequalities for integrals
35A24	Methods of ordinary differential equations
35A25	Other special methods
35A27	Microlocal methods; methods of sheaf theory and homological algebra in PDE [See also 32C38, 58J15]
35A30	Geometric theory, characteristics, transformations [See also 58J70, 58J72]
35A35	Theoretical approximation to solutions {For numerical analysis, see 65Mxx, 65Nxx}
35A99	None of the above, but in this section
35Bxx	**Qualitative properties of solutions**
35B05	Oscillation, zeros of solutions, mean value theorems, etc.
35B06	Symmetries, invariants, etc.
35B07	Axially symmetric solutions
35B08	Entire solutions
35B09	Positive solutions
35B10	Periodic solutions
35B15	Almost and pseudo-almost periodic solutions
35B20	Perturbations
35B25	Singular perturbations
35B27	Homogenization; equations in media with periodic structure [See also 74Qxx, 76M50]
35B30	Dependence of solutions on initial and boundary data, parameters [See also 37Cxx]
35B32	Bifurcation [See also 37Gxx, 37K50]
35B33	Critical exponents
35B34	Resonances
35B35	Stability
35B36	Pattern formation
35B38	Critical points
35B40	Asymptotic behavior of solutions
35B41	Attractors

35B42	Inertial manifolds
35B44	Blow-up
35B45	A priori estimates
35B50	Maximum principles
35B51	Comparison principles
35B53	Liouville theorems, Phragmén-Lindelöf theorems
35B60	Continuation and prolongation of solutions [See also 58A15, 58A17, 58Hxx]
35B65	Smoothness and regularity of solutions
35B99	None of the above, but in this section
35Cxx	**Representations of solutions**
35C05	Solutions in closed form
35C06	Self-similar solutions
35C07	Traveling wave solutions
35C08	Soliton solutions
35C09	Trigonometric solutions
35C10	Series solutions
35C11	Polynomial solutions
35C15	Integral representations of solutions
35C20	Asymptotic expansions
35C99	None of the above, but in this section
35Dxx	**Generalized solutions**
35D30	Weak solutions
35D35	Strong solutions
35D40	Viscosity 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	Linear first-order equations
35F10	Initial value problems for linear first-order equations
35F15	Boundary value problems for linear first-order equations
35F16	Initial-boundary value problems for linear first-order equations
35F20	Nonlinear first-order equations
35F21	Hamilton-Jacobi equations
35F25	Initial value problems for nonlinear first-order equations
35F30	Boundary value problems for nonlinear first-order equations
35F31	Initial-boundary value problems for nonlinear first-order equations
35F35	Linear first-order systems
35F40	Initial value problems for linear first-order systems
35F45	Boundary value problems for linear first-order systems
35F46	Initial-boundary value problems for linear first-order systems
35F50	Nonlinear first-order systems
35F55	Initial value problems for nonlinear first-order systems
35F60	Boundary value problems for nonlinear first-order systems
35F61	Initial-boundary value problems for nonlinear first-order systems
35F99	None of the above, but in this section
35Gxx	**General higher-order equations and systems**
35G05	Linear higher-order equations
35G10	Initial value problems for linear higher-order equations
35G15	Boundary value problems for linear higher-order equations
35G16	Initial-boundary value problems for linear higher-order equations
35G20	Nonlinear higher-order equations
35G25	Initial value problems for nonlinear higher-order equations
35G30	Boundary value problems for nonlinear higher-order equations
35G31	Initial-boundary value problems for nonlinear higher-order equations
35G35	Linear higher-order systems
35G40	Initial value problems for linear higher-order systems
35G45	Boundary value problems for linear higher-order systems
35G46	Initial-boundary value problems for linear higher-order systems
35G50	Nonlinear higher-order systems
35G55	Initial value problems for nonlinear higher-order systems
35G60	Boundary value problems for nonlinear higher-order systems
35G61	Initial-boundary value problems for nonlinear higher-order systems
35G99	None of the above, but in this section
35Hxx	**Close-to-elliptic equations and systems**
35H10	Hypoelliptic equations
35H20	Subelliptic equations
35H30	Quasi-elliptic equations
35H99	None of the above, but in this section
35Jxx	**Elliptic equations and systems [See also 58J10, 58J20]**
35J05	Laplacian operator, reduced wave equation (Helmholtz equation), Poisson equation [See also 31Axx, 31Bxx]
35J08	Green's functions
35J10	Schrödinger operator [See also 35Pxx]
35J15	Second-order elliptic equations

35J20	Variational methods for second-order elliptic equations
35J25	Boundary value problems for second-order elliptic equations
35J30	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
35J46	First-order elliptic systems
35J47	Second-order elliptic systems
35J48	Higher-order elliptic systems
35J50	Variational methods for elliptic systems
35J56	Boundary value problems for first-order elliptic systems
35J57	Boundary value problems for second-order elliptic systems
35J58	Boundary value problems for higher-order elliptic systems
35J60	Nonlinear elliptic equations
35J61	Semilinear elliptic equations
35J62	Quasilinear elliptic equations
35J65	Nonlinear boundary value problems for linear elliptic equations
35J66	Nonlinear boundary value problems for nonlinear elliptic equations
35J67	Boundary values of solutions to elliptic equations
35J70	Degenerate elliptic equations
35J75	Singular elliptic equations
35J86	Linear elliptic unilateral problems and linear elliptic variational inequalities [See also 35R35, 49J40]
35J87	Nonlinear elliptic unilateral problems and nonlinear elliptic variational inequalities [See also 35R35, 49J40]
35J88	Systems of elliptic variational inequalities [See also 35R35, 49J40]
35J91	Semilinear elliptic equations with Laplacian, bi-Laplacian or poly-Laplacian
35J92	Quasilinear elliptic equations with p-Laplacian
35J93	Quasilinear elliptic equations with mean curvature operator
35J96	Elliptic Monge-Ampère equations
35J99	None of the above, but in this section
35Kxx	**Parabolic equations and systems [See also 35Bxx, 35Dxx, 35R30, 35R35, 58J35]**
35K05	Heat equation
35K08	Heat kernel
35K10	Second-order parabolic equations
35K15	Initial value problems for second-order parabolic equations
35K20	Initial-boundary value problems for second-order parabolic equations
35K25	Higher-order parabolic equations
35K30	Initial value problems for higher-order parabolic equations
35K35	Initial-boundary value problems for higher-order parabolic equations
35K40	Second-order parabolic systems
35K41	Higher-order parabolic systems
35K45	Initial value problems for second-order parabolic systems
35K46	Initial value problems for higher-order parabolic systems
35K51	Initial-boundary value problems for second-order parabolic systems
35K52	Initial-boundary value problems for higher-order parabolic systems
35K55	Nonlinear parabolic equations
35K57	Reaction-diffusion equations
35K58	Semilinear parabolic equations
35K59	Quasilinear parabolic equations
35K60	Nonlinear initial value problems for linear parabolic equations
35K61	Nonlinear initial-boundary value problems for nonlinear parabolic equations
35K65	Degenerate parabolic equations
35K67	Singular parabolic equations
35K70	Ultraparabolic equations, pseudoparabolic equations, etc.
35K85	Linear parabolic unilateral problems and linear parabolic variational inequalities [See also 35R35, 49J40]
35K86	Nonlinear parabolic unilateral problems and nonlinear parabolic variational inequalities [See also 35R35, 49J40]
35K87	Systems of parabolic variational inequalities [See also 35R35, 49J40]
35K90	Abstract parabolic equations
35K91	Semilinear parabolic equations with Laplacian, bi-Laplacian or poly-Laplacian
35K92	Quasilinear parabolic equations with p-Laplacian
35K93	Quasilinear parabolic equations with mean curvature operator
35K96	Parabolic Monge-Ampère equations
35K99	None of the above, but in this section
35Lxx	**Hyperbolic equations and systems [See also 58J45]**
35L02	First-order hyperbolic equations
35L03	Initial value problems for first-order hyperbolic equations
35L04	Initial-boundary value problems for first-order hyperbolic equations
35L05	Wave equation
35L10	Second-order hyperbolic equations
35L15	Initial value problems for second-order hyperbolic equations
35L20	Initial-boundary value problems for second-order hyperbolic equations
35L25	Higher-order hyperbolic equations
35L30	Initial value problems for higher-order hyperbolic equations

35L35	Initial-boundary value problems for higher-order hyperbolic equations
35L40	First-order hyperbolic systems
35L45	Initial value problems for first-order hyperbolic systems
35L50	Initial-boundary value problems for first-order hyperbolic systems
35L51	Second-order hyperbolic systems
35L52	Initial value problems for second-order hyperbolic systems
35L53	Initial-boundary value problems for second-order hyperbolic systems
35L55	Higher-order hyperbolic systems
35L56	Initial value problems for higher-order hyperbolic systems
35L57	Initial-boundary value problems for higher-order hyperbolic systems
35L60	Nonlinear first-order hyperbolic equations
35L65	Conservation laws
35L67	Shocks and singularities [See also 58Kxx, 76L05]
35L70	Nonlinear second-order hyperbolic equations
35L71	Semilinear second-order hyperbolic equations
35L72	Quasilinear second-order hyperbolic equations
35L75	Nonlinear higher-order hyperbolic equations
35L76	Semilinear higher-order hyperbolic equations
35L77	Quasilinear higher-order hyperbolic equations
35L80	Degenerate hyperbolic equations
35L81	Singular hyperbolic equations
35L82	Pseudohyperbolic equations
35L85	Linear hyperbolic unilateral problems and linear hyperbolic variational inequalities [See also 35R35, 49J40]
35L86	Nonlinear hyperbolic unilateral problems and nonlinear hyperbolic variational inequalities [See also 35R35, 49J40]
35L87	Unilateral problems and variational inequalities for hyperbolic systems [See also 35R35, 49J40]
35L90	Abstract hyperbolic equations
35L99	None of the above, but in this section
35Mxx	**Equations and systems of special type (mixed, composite, etc.)**
35M10	Equations of mixed type
35M11	Initial value problems for equations of mixed type
35M12	Boundary value problems for equations of mixed type
35M13	Initial-boundary value problems for equations of mixed type
35M30	Systems of mixed type
35M31	Initial value problems for systems of mixed type
35M32	Boundary value problems for systems of mixed type
35M33	Initial-boundary value problems for systems of mixed type
35M85	Linear unilateral problems and variational inequalities of mixed type [See also 35R35, 49J40]
35M86	Nonlinear unilateral problems and nonlinear variational inequalities of mixed type [See also 35R35, 49J40]
35M87	Systems of variational inequalities of mixed type [See also 35R35, 49J40]
35M99	None of the above, but in this section
35Nxx	**Overdetermined systems [See also 58Hxx, 58J10, 58J15]**
35N05	Overdetermined systems with constant coefficients
35N10	Overdetermined systems with variable coefficients
35N15	$\bar{\partial}$-Neumann problem and generalizations; formal complexes [See also 32W05, 32W10, 58J10]
35N20	Overdetermined initial value problems
35N25	Overdetermined boundary value problems
35N30	Overdetermined initial-boundary value problems
35N99	None of the above, but in this section
35Pxx	**Spectral theory and eigenvalue problems [See also 47Axx, 47Bxx, 47F05]**
35P05	General topics in linear spectral theory
35P10	Completeness of eigenfunctions, eigenfunction expansions
35P15	Estimation of eigenvalues, upper and lower bounds
35P20	Asymptotic distribution of eigenvalues and eigenfunctions
35P25	Scattering theory [See also 47A40]
35P30	Nonlinear eigenvalue problems, nonlinear spectral theory
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 equations
35Q15	Riemann-Hilbert problems [See also 30E25, 31A25, 31B20]
35Q20	Boltzmann equations
35Q30	Navier-Stokes equations [See also 76D05, 76D07, 76N10]
35Q31	Euler equations [See also 76D05, 76D07, 76N10]
35Q35	PDEs in connection with fluid mechanics
35Q40	PDEs in connection with quantum mechanics
35Q41	Time-dependent Schrödinger equations, Dirac equations
35Q51	Soliton-like equations [See also 37K40]
35Q53	KdV-like equations (Korteweg-de Vries) [See also 37K10]
35Q55	NLS-like equations (nonlinear Schrödinger) [See also 37K10]
35Q56	Ginzburg-Landau equations
35Q60	PDEs in connection with optics and electromagnetic theory
35Q61	Maxwell equations

35Q62	PDEs in connection with statistics
35Q68	PDEs in connection with computer science
35Q70	PDEs in connection with mechanics of particles and systems
35Q74	PDEs in connection with mechanics of deformable solids
35Q75	PDEs in connection with relativity and gravitational theory
35Q76	Einstein equations
35Q79	PDEs in connection with classical thermodynamics and heat transfer
35Q82	PDEs in connection with statistical mechanics
35Q83	Vlasov-like equations
35Q84	Fokker-Planck equations
35Q85	PDEs in connection with astronomy and astrophysics
35Q86	PDEs in connection with geophysics
35Q90	PDEs in connection with mathematical programming
35Q91	PDEs in connection with game theory, economics, social and behavioral sciences
35Q92	PDEs in connection with biology and other natural sciences
35Q93	PDEs in connection with control and optimization
35Q94	PDEs in connection with information and communication
35Q99	None of the above, but in this section
35Rxx	**Miscellaneous topics {For equations on manifolds, see 58Jxx; for manifolds of solutions, see 58Bxx; for stochastic PDE, see also 60H15}**
35R01	Partial differential equations on manifolds [See also 32Wxx, 53Cxx, 58Jxx]
35R02	Partial differential equations on graphs and networks (ramified or polygonal spaces)
35R03	Partial differential equations on Heisenberg groups, Lie groups, Carnot groups, etc.
35R05	Partial differential equations with discontinuous coefficients or data
35R06	Partial differential equations with measure
35R09	Integro-partial differential equations [See also 45Kxx]
35R10	Partial functional-differential equations
35R11	Fractional partial differential equations
35R12	Impulsive partial differential equations
35R13	Fuzzy partial differential equations
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, 47H20, 47Jxx]
35R25	Improperly posed problems
35R30	Inverse problems
35R35	Free boundary problems
35R37	Moving boundary problems
35R45	Partial differential inequalities
35R50	Partial differential equations of infinite order
35R60	Partial differential equations with randomness, stochastic partial differential equations [See also 60H15]
35R70	Partial differential equations 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, 58J40]**
35S05	Pseudodifferential operators
35S10	Initial value problems for pseudodifferential operators
35S11	Initial-boundary value problems for pseudodifferential operators
35S15	Boundary value problems for pseudodifferential operators
35S30	Fourier integral operators
35S35	Topological aspects: intersection cohomology, stratified sets, etc. [See also 32C38, 32S40, 32S60, 58J15]
35S50	Paradifferential operators
35S99	None of the above, but in this section
37-XX	**DYNAMICAL SYSTEMS AND ERGODIC THEORY [See also 26A18, 28Dxx, 34Cxx, 34Dxx, 35Bxx, 46Lxx, 58Jxx, 70-XX]**
37-00	General reference works (handbooks, dictionaries, bibliographies, etc.)
37-01	Instructional exposition (textbooks, tutorial papers, etc.)
37-02	Research exposition (monographs, survey articles)
37-03	Historical (must also be assigned at least one classification number from Section 01)
37-04	Explicit machine computation and programs (not the theory of computation or programming)
37-06	Proceedings, conferences, collections, etc.
37Axx	**Ergodic theory [See also 28Dxx]**
37A05	Measure-preserving transformations
37A10	One-parameter continuous families of measure-preserving transformations
37A15	General groups of measure-preserving transformations [See mainly 22Fxx]
37A17	Homogeneous flows [See also 22Fxx]

37A20 Orbit equivalence, cocycles, ergodic equivalence relations
37A25 Ergodicity, mixing, rates of mixing
37A30 Ergodic theorems, spectral theory, Markov operators {For operator ergodic theory, see mainly 47A35}
37A35 Entropy and other invariants, isomorphism, classification
37A40 Nonsingular (and infinite-measure preserving) transformations
37A45 Relations with number theory and harmonic analysis [See also 11Kxx]
37A50 Relations with probability theory and stochastic processes [See also 60Fxx and 60G10]
37A55 Relations with the theory of C^*-algebras [See mainly 46L55]
37A60 Dynamical systems in statistical mechanics [See also 82Cxx]
37A99 None of the above, but in this section
37Bxx **Topological dynamics** [See also 54H20]
37B05 Transformations and group actions with special properties (minimality, distality, proximality, etc.)
37B10 Symbolic dynamics [See also 37Cxx, 37Dxx]
37B15 Cellular automata [See also 68Q80]
37B20 Notions of recurrence
37B25 Lyapunov functions and stability; attractors, repellers
37B30 Index theory, Morse-Conley indices
37B35 Gradient-like and recurrent behavior; isolated (locally maximal) invariant sets
37B40 Topological entropy
37B45 Continua theory in dynamics
37B50 Multi-dimensional shifts of finite type, tiling dynamics
37B55 Nonautonomous dynamical systems
37B99 None of the above, but in this section
37Cxx **Smooth dynamical systems: general theory** [See also 34Cxx, 34Dxx]
37C05 Smooth mappings and diffeomorphisms
37C10 Vector fields, flows, ordinary differential equations
37C15 Topological and differentiable equivalence, conjugacy, invariants, moduli, classification
37C20 Generic properties, structural stability
37C25 Fixed points, periodic points, fixed-point index theory
37C27 Periodic orbits of vector fields and flows
37C29 Homoclinic and heteroclinic orbits
37C30 Zeta functions, (Ruelle-Frobenius) transfer operators, and other functional analytic techniques in dynamical systems
37C35 Orbit growth
37C40 Smooth ergodic theory, invariant measures [See also 37Dxx]
37C45 Dimension theory of dynamical systems
37C50 Approximate trajectories (pseudotrajectories, shadowing, etc.)
37C55 Periodic and quasiperiodic flows and diffeomorphisms
37C60 Nonautonomous smooth dynamical systems [See also 37B55]
37C65 Monotone flows
37C70 Attractors and repellers, topological structure
37C75 Stability theory
37C80 Symmetries, equivariant dynamical systems
37C85 Dynamics of group actions other than **Z** and **R**, and foliations [See mainly 22Fxx, and also 57R30, 57Sxx]
37C99 None of the above, but in this section
37Dxx **Dynamical systems with hyperbolic behavior**
37D05 Hyperbolic orbits and sets
37D10 Invariant manifold theory
37D15 Morse-Smale systems
37D20 Uniformly hyperbolic systems (expanding, Anosov, Axiom A, etc.)
37D25 Nonuniformly hyperbolic systems (Lyapunov exponents, Pesin theory, etc.)
37D30 Partially hyperbolic systems and dominated splittings
37D35 Thermodynamic formalism, variational principles, equilibrium states
37D40 Dynamical systems of geometric origin and hyperbolicity (geodesic and horocycle flows, etc.)
37D45 Strange attractors, chaotic dynamics
37D50 Hyperbolic systems with singularities (billiards, etc.)
37D99 None of the above, but in this section
37Exx **Low-dimensional dynamical systems**
37E05 Maps of the interval (piecewise continuous, continuous, smooth)
37E10 Maps of the circle
37E15 Combinatorial dynamics (types of periodic orbits)
37E20 Universality, renormalization [See also 37F25]
37E25 Maps of trees and graphs
37E30 Homeomorphisms and diffeomorphisms of planes and surfaces
37E35 Flows on surfaces
37E40 Twist maps
37E45 Rotation numbers and vectors
37E99 None of the above, but in this section

37Fxx **Complex dynamical systems** [See also 30D05, 32H50]
37F05 Relations and correspondences
37F10 Polynomials; rational maps; entire and meromorphic functions [See also 32A10, 32A20, 32H02, 32H04]
37F15 Expanding maps; hyperbolicity; structural stability
37F20 Combinatorics and topology
37F25 Renormalization
37F30 Quasiconformal methods and Teichmüller theory; Fuchsian and Kleinian groups as dynamical systems
37F35 Conformal densities and Hausdorff dimension
37F40 Geometric limits
37F45 Holomorphic families of dynamical systems; the Mandelbrot set; bifurcations
37F50 Small divisors, rotation domains and linearization; Fatou and Julia sets
37F75 Holomorphic foliations and vector fields [See also 32M25, 32S65, 34Mxx]
37F99 None of the above, but in this section
37Gxx **Local and nonlocal bifurcation theory** [See also 34C23, 34K18]
37G05 Normal forms
37G10 Bifurcations of singular points
37G15 Bifurcations of limit cycles and periodic orbits
37G20 Hyperbolic singular points with homoclinic trajectories
37G25 Bifurcations connected with nontransversal intersection
37G30 Infinite nonwandering sets arising in bifurcations
37G35 Attractors and their bifurcations
37G40 Symmetries, equivariant bifurcation theory
37G99 None of the above, but in this section
37Hxx **Random dynamical systems** [See also 15B52, 34D08, 34F05, 47B80, 70L05, 82C05, 93Exx]
37H05 Foundations, general theory of cocycles, algebraic ergodic theory [See also 37Axx]
37H10 Generation, random and stochastic difference and differential equations [See also 34F05, 34K50, 60H10, 60H15]
37H15 Multiplicative ergodic theory, Lyapunov exponents [See also 34D08, 37Axx, 37Cxx, 37Dxx]
37H20 Bifurcation theory [See also 37Gxx]
37H99 None of the above, but in this section
37Jxx **Finite-dimensional Hamiltonian, Lagrangian, contact, and nonholonomic systems** [See also 53Dxx, 70Fxx, 70Hxx]
37J05 General theory, relations with symplectic geometry and topology
37J10 Symplectic mappings, fixed points
37J15 Symmetries, invariants, invariant manifolds, momentum maps, reduction [See also 53D20]
37J20 Bifurcation problems
37J25 Stability problems
37J30 Obstructions to integrability (nonintegrability criteria)
37J35 Completely integrable systems, topological structure of phase space, integration methods
37J40 Perturbations, normal forms, small divisors, KAM theory, Arnol′d diffusion
37J45 Periodic, homoclinic and heteroclinic orbits; variational methods, degree-theoretic methods
37J50 Action-minimizing orbits and measures
37J55 Contact systems [See also 53D10]
37J60 Nonholonomic dynamical systems [See also 70F25]
37J99 None of the above, but in this section
37Kxx **Infinite-dimensional Hamiltonian systems** [See also 35Axx, 35Qxx]
37K05 Hamiltonian structures, symmetries, variational principles, conservation laws
37K10 Completely integrable systems, integrability tests, bi-Hamiltonian structures, hierarchies (KdV, KP, Toda, etc.)
37K15 Integration of completely integrable systems by inverse spectral and scattering methods
37K20 Relations with algebraic geometry, complex analysis, special functions [See also 14H70]
37K25 Relations with differential geometry
37K30 Relations with infinite-dimensional Lie algebras and other algebraic structures
37K35 Lie-Bäcklund and other transformations
37K40 Soliton theory, asymptotic behavior of solutions
37K45 Stability problems
37K50 Bifurcation problems
37K55 Perturbations, KAM for infinite-dimensional systems
37K60 Lattice dynamics [See also 37L60]
37K65 Hamiltonian systems on groups of diffeomorphisms and on manifolds of mappings and metrics
37K99 None of the above, but in this section

[MSC Source Date: Monday 21 December 2009 09:49]

37Lxx **Infinite-dimensional dissipative dynamical systems [See also 35Bxx, 35Qxx]**
37L05 General theory, nonlinear semigroups, evolution equations
37L10 Normal forms, center manifold theory, bifurcation theory
37L15 Stability problems
37L20 Symmetries
37L25 Inertial manifolds and other invariant attracting sets
37L30 Attractors and their dimensions, Lyapunov exponents
37L40 Invariant measures
37L45 Hyperbolicity; Lyapunov functions
37L50 Noncompact semigroups; dispersive equations; perturbations of Hamiltonian systems
37L55 Infinite-dimensional random dynamical systems; stochastic equations [See also 35R60, 60H10, 60H15]
37L60 Lattice dynamics [See also 37K60]
37L65 Special approximation methods (nonlinear Galerkin, etc.)
37L99 None of the above, but in this section
37Mxx **Approximation methods and numerical treatment of dynamical systems [See also 65Pxx]**
37M05 Simulation
37M10 Time series analysis
37M15 Symplectic integrators
37M20 Computational methods for bifurcation problems
37M25 Computational methods for ergodic theory (approximation of invariant measures, computation of Lyapunov exponents, entropy)
37M99 None of the above, but in this section
37Nxx **Applications**
37N05 Dynamical systems in classical and celestial mechanics [See mainly 70Fxx, 70Hxx, 70Kxx]
37N10 Dynamical systems in fluid mechanics, oceanography and meteorology [See mainly 76–XX, especially 76D05, 76F20, 86A05, 86A10]
37N15 Dynamical systems in solid mechanics [See mainly 74Hxx]
37N20 Dynamical systems in other branches of physics (quantum mechanics, general relativity, laser physics)
37N25 Dynamical systems in biology [See mainly 92–XX, but also 91–XX]
37N30 Dynamical systems in numerical analysis
37N35 Dynamical systems in control
37N40 Dynamical systems in optimization and economics
37N99 None of the above, but in this section
37Pxx **Arithmetic and non-Archimedean dynamical systems [See also 11S82, 37A45]**
37P05 Polynomial and rational maps
37P10 Analytic and meromorphic maps
37P15 Global ground fields
37P20 Non-Archimedean local ground fields
37P25 Finite ground fields
37P30 Height functions; Green functions; invariant measures [See also 11G50, 14G40]
37P35 Arithmetic properties of periodic points
37P40 Non-Archimedean Fatou and Julia sets
37P45 Families and moduli spaces
37P50 Dynamical systems on Berkovich spaces
37P55 Arithmetic dynamics on general algebraic varieties
37P99 None of the above, but in this section

39-XX **DIFFERENCE 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 37–XX; for dynamic equations on time scales, see 34N05}**
39A05 General theory
39A06 Linear equations
39A10 Difference equations, additive
39A12 Discrete version of topics in analysis
39A13 Difference equations, scaling (q-differences) [See also 33Dxx]
39A14 Partial difference equations
39A20 Multiplicative and other generalized difference equations, e.g. of Lyness type
39A21 Oscillation theory
39A22 Growth, boundedness, comparison of solutions
39A23 Periodic solutions
39A24 Almost periodic solutions
39A28 Bifurcation theory

39A30 Stability theory
39A33 Complex (chaotic) behavior of solutions
39A45 Equations in the complex domain
39A50 Stochastic difference equations
39A60 Applications
39A70 Difference operators [See also 47B39]
39A99 None of the above, but in this section
39Bxx **Functional equations and inequalities [See also 30D05]**
39B05 General
39B12 Iteration theory, iterative and composite equations [See also 26A18, 30D05, 37–XX]
39B22 Equations for real functions [See also 26A51, 26B25]
39B32 Equations for complex functions [See also 30D05]
39B42 Matrix and operator equations [See also 47Jxx]
39B52 Equations for functions with more general domains and/or ranges
39B55 Orthogonal additivity and other conditional equations
39B62 Functional inequalities, including subadditivity, convexity, etc. [See also 26A51, 26B25, 26Dxx]
39B72 Systems of functional equations and inequalities
39B82 Stability, separation, extension, and related topics [See also 46A22]
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
40A35 Ideal and statistical convergence [See also 40G15]
40A99 None of the above, but in this section
40Bxx **Multiple sequences and series**
40B05 Multiple sequences and series (should also be assigned at least one other classification number in this section)
40B99 None of the above, but 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
40Fxx **Absolute and strong summability (should also be assigned at least one other classification number in Section 40)**
40F05 Absolute and strong summability (should also be assigned at least one other classification number in Section 40)
40F99 None of the above, but in this section
40Gxx **Special methods of summability**
40G05 Cesàro, Euler, Nörlund and Hausdorff methods
40G10 Abel, Borel and power series methods
40G15 Summability methods using statistical convergence [See also 40A35]
40G99 None of the above, but in this section
40Hxx **Functional analytic methods in summability**
40H05 Functional analytic methods in summability
40H99 None of the above, but in this section

40Jxx	**Summability in abstract structures** [See also **43A55**, **46A35**, **46B15**]
40J05	Summability in abstract structures [See also 43A55, 46A35, 46B15] (should also be assigned at least one other classification number in this section)
40J99	None of the above, but in this section
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.
41Axx	**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**}
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	None of the above, but in this section
42-XX	**HARMONIC ANALYSIS ON EUCLIDEAN SPACES**
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	**Harmonic 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 and absolute convergence of Fourier and trigonometric series
42A24	Summability and absolute summability of Fourier and trigonometric series
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	**Harmonic 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 and oscillatory integrals (Calderón-Zygmund, etc.)
42B25	Maximal functions, Littlewood-Paley theory
42B30	H^p-spaces
42B35	Function spaces arising in harmonic analysis
42B37	Harmonic analysis and PDE [See also 35–XX]
42B99	None of the above, but in this section
42Cxx	**Nontrigonometric harmonic 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	General harmonic expansions, frames
42C20	Other transformations of harmonic type
42C25	Uniqueness and localization for orthogonal series
42C30	Completeness of sets of functions
42C40	Wavelets and other special systems
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.
43Axx	**Abstract harmonic analysis** {**For other analysis on topological and Lie groups, see 22Exx**}
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 and other 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 and other 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, 33C55]
43A95	Categorical methods [See also 46Mxx]
43A99	None of the above, but in this section

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.
44Axx	**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**}
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	None of the above, but in this section

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.
45Axx	**Linear integral equations**
45A05	Linear integral equations
45A99	None of the above, but in this section
45Bxx	**Fredholm integral equations**
45B05	Fredholm integral equations
45B99	None of the above, but in this section
45Cxx	**Eigenvalue problems [See also 34Lxx, 35Pxx, 45P05, 47A75]**
45C05	Eigenvalue problems [See also 34Lxx, 35Pxx, 45P05, 47A75]
45C99	None of the above, but in this section
45Dxx	**Volterra integral equations [See also 34A12]**
45D05	Volterra integral equations [See also 34A12]
45D99	None of the above, but in this section
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 47H30, 47Jxx]**
45G05	Singular nonlinear integral equations
45G10	Other nonlinear integral equations
45G15	Systems of nonlinear integral equations
45G99	None of the above, but in this section
45Hxx	**Miscellaneous special kernels [See also 44A15]**
45H05	Miscellaneous special kernels [See also 44A15]
45H99	None of the above, but in this section
45Jxx	**Integro-ordinary differential equations [See also 34K05, 34K30, 47G20]**
45J05	Integro-ordinary differential equations [See also 34K05, 34K30, 47G20]
45J99	None of the above, but in this section

45Kxx	**Integro-partial differential equations [See also 34K30, 35R09, 35R10, 47G20]**
45K05	Integro-partial differential equations [See also 34K30, 35R09, 35R10, 47G20]
45K99	None of the above, but in this section
45Lxx	**Theoretical approximation of solutions {For numerical analysis, see 65Rxx}**
45L05	Theoretical approximation of solutions {For numerical analysis, see 65Rxx}
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
45Nxx	**Abstract integral equations, integral equations in abstract spaces**
45N05	Abstract integral equations, integral equations in abstract spaces
45N99	None of the above, but in this section
45Pxx	**Integral operators [See also 47B38, 47G10]**
45P05	Integral operators [See also 47B38, 47G10]
45P99	None of the above, but in this section
45Qxx	**Inverse problems**
45Q05	Inverse problems
45Q99	None of the above, but in this section
45Rxx	**Random integral equations [See also 60H20]**
45R05	Random integral equations [See also 60H20]
45R99	None of the above, but in this section

46-XX **FUNCTIONAL ANALYSIS** {For manifolds modeled on topological linear spaces, see 57Nxx, 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, 47L05, 47L20]
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]
46A61	Graded Fréchet spaces and tame operators
46A63	Topological invariants ((DN), (Ω), etc.)
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
46B06	Asymptotic theory of Banach spaces [See also 52A23]

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-Milman 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, 47L05, 47L20]

46B40   Ordered normed spaces [See also 46A40, 46B42]

46B42   Banach lattices [See also 46A40, 46B40]

46B45   Banach sequence spaces [See also 46A45]

46B50   Compactness in Banach (or normed) spaces

46B70   Interpolation between normed linear spaces [See also 46M35]

46B80   Nonlinear classification of Banach spaces; nonlinear quotients

46B85   Embeddings of discrete metric spaces into Banach spaces; applications in topology and computer science [See also 05C12, 68Rxx]

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)

46C07   Hilbert subspaces (= operator ranges); complementation (Aronszajn, de Branges, etc.) [See also 46B70, 46M35]

46C15   Characterizations of Hilbert spaces

46C20   Spaces with indefinite inner product (Kreĭn spaces, Pontryagin spaces, etc.) [See also 47B50]

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, 32A38, 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, including de Branges-Rovnyak and other structured spaces) [See also 47B32]

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, 46G25, 47H60]

46E99   None of the above, but in this section

46Fxx   **Distributions, generalized functions, distribution spaces [See also 46T30]**

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, 58J15]

46F20   Distributions and ultradistributions as boundary values of analytic functions [See also 30D40, 30E25, 32A40]

46F25   Distributions on infinite-dimensional spaces [See also 58C35]

46F30   Generalized functions for nonlinear analysis (Rosinger, Colombeau, nonstandard, etc.)

46F99   None of the above, but in this section

46Gxx   **Measures, integration, derivative, holomorphy (all involving infinite-dimensional spaces) [See also 28–XX, 46Txx]**

46G05   Derivatives [See also 46T20, 58C20, 58C25]

46G10   Vector-valued measures and integration [See also 28Bxx, 46B22]

46G12   Measures and integration on abstract linear spaces [See also 28C20, 46T12]

46G15   Functional analytic lifting theory [See also 28A51]

46G20   Infinite-dimensional holomorphy [See also 32–XX, 46E50, 46T25, 58B12, 58C10]

46G25   (Spaces of) multilinear mappings, polynomials [See also 46E50, 46G20, 47H60]

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 47Lxx]

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 30H10, 32A35, 32A37, 32A38, 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, 47Lxx]**

46L05   General theory of C^*-algebras

46L06   Tensor products of C^*-algebras

46L07   Operator spaces and completely bounded maps [See also 47L25]

46L08 C^*-modules

46L09   Free products of C^*-algebras

46L10   General theory of von Neumann algebras

46L30   States

46L35   Classifications of C^*-algebras

46L36   Classification of factors

46L37   Subfactors and their classification

46L40   Automorphisms

46L45   Decomposition theory for C^*-algebras

46L51   Noncommutative measure and integration

46L52   Noncommutative function spaces

46L53   Noncommutative probability and statistics

46L54   Free probability and free operator algebras

46L55   Noncommutative dynamical systems [See also 28Dxx, 37Kxx, 37Lxx, 54H20]

46L57   Derivations, dissipations and positive semigroups in C^*-algebras

46L60   Applications of selfadjoint operator algebras to physics [See also 46N50, 46N55, 47L90, 81T05, 82B10, 82C10]

46L65   Quantizations, deformations

46L70   Nonassociative selfadjoint operator algebras [See also 46H70, 46K70]

46L80 K-theory and operator algebras (including cyclic theory) [See also 18F25, 19Kxx, 46M20, 55Rxx, 58J22]

46L85   Noncommutative topology [See also 58B32, 58B34, 58J22]

46L87   Noncommutative differential geometry [See also 58B32, 58B34, 58J22]

46L89   Other "noncommutative" mathematics based on C^*-algebra theory [See also 58B32, 58B34, 58J22]

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   Categories, functors {For K-theory, EXT, etc., see 19K33, 46L80, 46M18, 46M20}

46M18   Homological methods (exact sequences, right inverses, lifting, etc.)

46M20 Methods of algebraic topology (cohomology, sheaf and bundle theory, etc.) [See also 14F05, 18Fxx, 19Kxx, 32Cxx, 32Lxx, 46L80, 46M15, 46M18, 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 $\mathbf{R}$ or $\mathbf{C}$ or the quaternions; non-Archimedean functional analysis [See also 12J25, 32P05]
46S20 Nonstandard functional analysis [See also 03H05]
46S30 Constructive functional analysis [See also 03F60]
46S40 Fuzzy functional analysis [See also 03E72]
46S50 Functional analysis in probabilistic metric linear spaces
46S60 Functional analysis on superspaces (supermanifolds) or graded spaces [See also 58A50 and 58C50]
46S99 None of the above, but in this section
46Txx **Nonlinear functional analysis [See also 47Hxx, 47Jxx, 58Cxx, 58Dxx]**
46T05 Infinite-dimensional manifolds [See also 53Axx, 57N20, 58Bxx, 58Dxx]
46T10 Manifolds of mappings
46T12 Measure (Gaussian, cylindrical, etc.) and integrals (Feynman, path, Fresnel, etc.) on manifolds [See also 28Cxx, 46G12, 60–XX]
46T20 Continuous and differentiable maps [See also 46G05]
46T25 Holomorphic maps [See also 46G20]
46T30 Distributions and generalized functions on nonlinear spaces [See also 46Fxx]
46T99 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.)
47A06 Linear relations (multivalued linear operators)
47A07 Forms (bilinear, sesquilinear, multilinear)
47A10 Spectrum, resolvent
47A11 Local spectral properties
47A12 Numerical range, numerical radius
47A13 Several-variable operator theory (spectral, Fredholm, etc.)
47A15 Invariant subspaces [See also 47A46]
47A16 Cyclic vectors, hypercyclic and chaotic operators
47A20 Dilations, extensions, compressions
47A25 Spectral sets
47A30 Norms (inequalities, more than one norm, etc.)
47A35 Ergodic theory [See also 28Dxx, 37Axx]
47A40 Scattering theory [See also 34L25, 35P25, 37K15, 58J50, 81Uxx]
47A45 Canonical models for contractions and nonselfadjoint operators
47A46 Chains (nests) of projections or of invariant subspaces, integrals along chains, etc.
47A48 Operator colligations (= nodes), vessels, linear systems, characteristic functions, realizations, etc.
47A50 Equations and inequalities involving linear operators, with vector unknowns
47A52 Ill-posed problems, regularization [See also 35R25, 47J06, 65F22, 65J20, 65L08, 65M30, 65R30]
47A53 (Semi-) Fredholm operators; index theories [See also 58B15, 58J20]
47A55 Perturbation theory [See also 47H14, 58J37, 70H09, 81Q15]
47A56 Functions whose values are linear operators (operator and matrix valued functions, etc., including analytic and meromorphic ones)
47A57 Operator methods in interpolation, moment and extension problems [See also 30E05, 42A70, 42A82, 44A60]
47A58 Operator approximation theory
47A60 Functional calculus

47A62 Equations involving linear operators, with operator unknowns
47A63 Operator inequalities
47A64 Operator means, shorted operators, etc.
47A65 Structure theory
47A66 Quasitriangular and nonquasitriangular, quasidiagonal and nonquasidiagonal 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 47J10, 49R05]
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 47L20]
47B15 Hermitian and normal operators (spectral measures, functional calculus, etc.)
47B20 Subnormal operators, hyponormal operators, etc.
47B25 Symmetric and selfadjoint operators (unbounded)
47B32 Operators in reproducing-kernel Hilbert spaces (including de Branges, de Branges-Rovnyak, and other structured spaces) [See also 46E22]
47B33 Composition operators
47B34 Kernel operators
47B35 Toeplitz operators, Hankel operators, Wiener-Hopf operators [See also 45P05, 47G10 for other integral operators; see also 32A25, 32M15]
47B36 Jacobi (tridiagonal) operators (matrices) and generalizations
47B37 Operators on special spaces (weighted shifts, operators on sequence spaces, etc.)
47B38 Operators on function spaces (general)
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, preservers (operators on spaces of operators)
47B50 Operators on spaces with an indefinite metric [See also 46C50]
47B60 Operators on ordered spaces
47B65 Positive operators and order-bounded operators
47B80 Random operators [See also 47H40, 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 **Groups and semigroups of linear operators, their generalizations and applications**
47D03 Groups and semigroups of linear operators {For nonlinear operators, see 47H20; see also 20M20}
47D06 One-parameter semigroups and linear evolution equations [See also 34G10, 34K30]
47D07 Markov semigroups and applications to diffusion processes {For Markov processes, see 60Jxx}
47D08 Schrödinger and Feynman-Kac semigroups
47D09 Operator sine and cosine functions and higher-order Cauchy problems [See also 34G10]
47D60 C-semigroups, regularized semigroups
47D62 Integrated semigroups
47D99 None of the above, but in this section
47Exx **Ordinary differential operators [See also 34Bxx, 34Lxx]**
47E05 Ordinary differential operators [See also 34Bxx, 34Lxx] (should also be assigned at least one other classification number in section 47)
47E99 None of the above, but in this section
47Fxx **Partial differential operators [See also 35Pxx, 58Jxx]**
47F05 Partial differential operators [See also 35Pxx, 58Jxx] (should also be assigned at least one other classification number in section 47)
47F99 None of the above, but in this section
47Gxx **Integral, integro-differential, and pseudodifferential operators [See also 58Jxx]**
47G10 Integral operators [See also 45P05]
47G20 Integro-differential operators [See also 34K30, 35R09, 35R10, 45Jxx, 45Kxx]
47G30 Pseudodifferential operators [See also 35Sxx, 58Jxx]

[MSC Source Date: Monday 21 December 2009 09:49]

47G40   Potential operators [See also 31–XX]
47G99   None of the above, but in this section
47Hxx   **Nonlinear operators and their properties {For global and geometric aspects, see 49J53, 58–XX, especially 58Cxx}**
47H04   Set-valued operators [See also 28B20, 54C60, 58C06]
47H05   Monotone operators and generalizations
47H06   Accretive operators, dissipative operators, etc.
47H07   Monotone and positive operators on ordered Banach spaces or other ordered topological vector spaces
47H08   Measures of noncompactness and condensing mappings, K-set contractions, etc.
47H09   Contraction-type mappings, nonexpansive mappings, A-proper mappings, etc.
47H10   Fixed-point theorems [See also 37C25, 54H25, 55M20, 58C30]
47H11   Degree theory [See also 55M25, 58C30]
47H14   Perturbations of nonlinear operators [See also 47A55, 58J37, 70H09, 70K60, 81Q15]
47H20   Semigroups of nonlinear operators [See also 37L05, 47J35, 54H15, 58D07]
47H25   Nonlinear ergodic theorems [See also 28Dxx, 37Axx, 47A35]
47H30   Particular nonlinear operators (superposition, Hammerstein, Nemytskiĭ, Uryson, etc.) [See also 45Gxx, 45P05]
47H40   Random operators [See also 47B80, 60H25]
47H60   Multilinear and polynomial operators [See also 46G25]
47H99   None of the above, but in this section
47Jxx   **Equations and inequalities involving nonlinear operators [See also 46Txx] {For global and geometric aspects, see 58–XX}**
47J05   Equations involving nonlinear operators (general) [See also 47H10, 47J25]
47J06   Nonlinear ill-posed problems [See also 35R25, 47A52, 65F22, 65J20, 65L08, 65M30, 65R30]
47J07   Abstract inverse mapping and implicit function theorems [See also 46T20 and 58C15]
47J10   Nonlinear spectral theory, nonlinear eigenvalue problems [See also 49R05]
47J15   Abstract bifurcation theory [See also 34C23, 37Gxx, 58E07, 58E09]
47J20   Variational and other types of inequalities involving nonlinear operators (general) [See also 49J40]
47J22   Variational and other types of inclusions [See also 34A60, 49J21, 49K21]
47J25   Iterative procedures [See also 65J15]
47J30   Variational methods [See also 58Exx]
47J35   Nonlinear evolution equations [See also 34G20, 35K90, 35L90, 35Qxx, 35R20, 37Kxx, 37Lxx, 47H20, 58D25]
47J40   Equations with hysteresis operators [See also 34C55, 74N30]
47J99   None of the above, but in this section
47Lxx   **Linear spaces and algebras of operators [See also 46Lxx]**
47L05   Linear spaces of operators [See also 46A32 and 46B28]
47L07   Convex sets and cones of operators [See also 46A55]
47L10   Algebras of operators on Banach spaces and other topological linear spaces
47L15   Operator algebras with symbol structure
47L20   Operator ideals [See also 47B10]
47L22   Ideals of polynomials and of multilinear mappings
47L25   Operator spaces (= matricially normed spaces) [See also 46L07]
47L30   Abstract operator algebras on Hilbert spaces
47L35   Nest algebras, CSL algebras
47L40   Limit algebras, subalgebras of C^*-algebras
47L45   Dual algebras; weakly closed singly generated operator algebras
47L50   Dual spaces of operator algebras
47L55   Representations of (nonselfadjoint) operator algebras
47L60   Algebras of unbounded operators; partial algebras of operators
47L65   Crossed product algebras (analytic crossed products)
47L70   Nonassociative nonselfadjoint operator algebras
47L75   Other nonselfadjoint operator algebras
47L80   Algebras of specific types of operators (Toeplitz, integral, pseudodifferential, etc.)
47L90   Applications of operator algebras to physics
47L99   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 the physical sciences
47N60   Applications in chemistry and life sciences
47N70   Applications in systems theory, circuits, and control theory
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 03F60]
47S40   Fuzzy operator theory [See also 03E72]
47S50   Operator theory in probabilistic metric linear spaces [See also 54E70]
47S99   None of the above, but in this section

49-XX   **CALCULUS OF VARIATIONS AND OPTIMAL CONTROL; OPTIMIZATION [See also 34H05, 34K35, 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 theories**
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
49J21   Optimal control problems involving relations other than differential equations
49J27   Problems in abstract spaces [See also 90C48, 93C25]
49J30   Optimal solutions belonging to restricted classes (Lipschitz controls, bang-bang controls, etc.)
49J35   Minimax problems
49J40   Variational methods including variational inequalities [See also 47J20]
49J45   Methods involving semicontinuity and convergence; relaxation
49J50   Fréchet and Gateaux differentiability [See also 46G05, 58C20]
49J52   Nonsmooth analysis [See also 46G05, 58C50, 90C56]
49J53   Set-valued and variational analysis [See also 28B20, 47H04, 54C60, 58C06]
49J55   Problems involving randomness [See also 93E20]
49J99   None of the above, but in this section
49Kxx   **Optimality conditions**
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
49K21   Problems involving relations other than differential equations
49K27   Problems in abstract spaces [See also 90C48, 93C25]
49K30   Optimal solutions belonging to restricted classes
49K35   Minimax problems
49K40   Sensitivity, stability, well-posedness [See also 90C31]
49K45   Problems involving randomness [See also 93E20]
49K99   None of the above, but in this section
49Lxx   **Hamilton-Jacobi theories, including dynamic programming**
49L20   Dynamic programming method
49L25   Viscosity solutions
49L99   None of the above, but in this section
49Mxx   **Numerical methods [See also 90Cxx, 65Kxx]**
49M05   Methods based on necessary conditions
49M15   Newton-type methods
49M20   Methods of relaxation type
49M25   Discrete approximations
49M27   Decomposition methods
49M29   Methods involving duality
49M30   Other methods
49M37   Methods of nonlinear programming type [See also 90C30, 65Kxx]
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
49N30   Problems with incomplete information [See also 93C41]
49N35   Optimal feedback synthesis [See also 93B52]
49N45   Inverse problems
49N60   Regularity of solutions
49N70   Differential games
49N75   Pursuit and evasion games
49N90   Applications of optimal control and differential games [See also 90C90, 93C95]
49N99   None of the above, but in this section

[MSC Source Date: Monday 21 December 2009 09:49]

49Qxx   **Manifolds [See also 58Exx]**
49Q05   Minimal surfaces [See also 53A10, 58E12]
49Q10   Optimization of shapes other than minimal surfaces [See also 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
49Q99   None of the above, but in this section
49Rxx   **Variational methods for eigenvalues of operators [See also 47A75]**
49R05   Variational methods for eigenvalues of operators [See also 47A75] (should also be assigned at least one other classification number in Section 49)
49R99   None of the above, but in this section
49Sxx   **Variational principles of physics**
49S05   Variational principles of physics (should also be assigned at least one other classification number in section 49)
49S99   None of the above, but in this section

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 imbeddable 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
51Cxx   **Ring geometry (Hjelmslev, Barbilian, etc.)**
51C05   Ring geometry (Hjelmslev, Barbilian, etc.)
51C99   None of the above, but in this section
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

51Gxx   **Ordered geometries (ordered incidence structures, etc.)**
51G05   Ordered geometries (ordered incidence structures, etc.)
51G99   None of the above, but in this section
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
51Pxx   **Geometry and physics (should also be assigned at least one other classification number from Sections 70–86)**
51P05   Geometry and physics (should also be assigned at least one other classification number from Sections 70–86)
51P99   None of the above, but in this section

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]
52A23 Asymptotic theory of convex bodies [See also 46B06]
52A27 Approximation by convex sets
52A30 Variants of convex sets (star-shaped, (m, n)-convex, etc.)
52A35 Helly-type theorems and geometric transversal theory
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 06A11, 13F20, 13Hxx]
52B22 Shellability
52B35 Gale and other diagrams
52B40 Matroids (realizations in the context of convex polytopes, convexity
  in combinatorial structures, etc.) [See also 05B35, 52Cxx]
52B45 Dissections and valuations (Hilbert's third problem, etc.)
52B55 Computational aspects related to convexity {For computational
  geometry and algorithms, see 68Q25, 68U05; for numerical
  algorithms, see 65Yxx} [See also 68Uxx]
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]
52C23 Quasicrystals, aperiodic tilings
52C25 Rigidity and flexibility of structures [See also 70B15]
52C26 Circle packings and discrete conformal geometry
52C30 Planar arrangements of lines and pseudolines
52C35 Arrangements of points, flats, hyperplanes [See also 32S22]
52C40 Oriented matroids
52C45 Combinatorial complexity of geometric structures [See also 68U05]
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-dimensional and -codimensional 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
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 32Q20]
53C08 Gerbes, differential characters: differential geometric aspects
53C10 G-structures
53C12 Foliations (differential geometric aspects) [See also 57R30, 57R32]
53C15 General geometric structures on manifolds (almost complex, almost
  product structures, etc.)
53C17 Sub-Riemannian geometry
53C20 Global Riemannian geometry, including pinching [See also 31C12,
  58B20]
53C21 Methods of Riemannian geometry, including PDE methods; curvature
  restrictions [See also 58J60]
53C22 Geodesics [See also 58E10]
53C23 Global geometric and topological methods (à la Gromov); differential
  geometric analysis on metric spaces
53C24 Rigidity results
53C25 Special Riemannian manifolds (Einstein, Sasakian, etc.)
53C26 Hyper-Kähler and quaternionic Kähler geometry, "special" geometry
53C27 Spin and Spin^c geometry
53C28 Twistor methods [See also 32L25]
53C29 Issues of holonomy
53C30 Homogeneous manifolds [See also 14M15, 14M17, 32M10, 57T15]
53C35 Symmetric spaces [See also 32M15, 57T15]
53C38 Calibrations and calibrated geometries
53C40 Global submanifolds [See also 53B25]
53C42 Immersions (minimal, prescribed curvature, tight, etc.)
  [See also 49Q05, 49Q10, 53A10, 57R40, 57R42]
53C43 Differential geometric aspects of harmonic maps [See also 58E20]
53C44 Geometric evolution equations (mean curvature flow, Ricci flow, etc.)
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
53Dxx **Symplectic geometry, contact geometry [See also 37Jxx, 70Gxx,**
  70Hxx]
53D05 Symplectic manifolds, general
53D10 Contact manifolds, general
53D12 Lagrangian submanifolds; Maslov index
53D15 Almost contact and almost symplectic manifolds
53D17 Poisson manifolds; Poisson groupoids and algebroids
53D18 Generalized geometries (à la Hitchin)
53D20 Momentum maps; symplectic reduction
53D22 Canonical transformations
53D25 Geodesic flows
53D30 Symplectic structures of moduli spaces
53D35 Global theory of symplectic and contact manifolds [See also 57Rxx]
53D37 Mirror symmetry, symplectic aspects; homological mirror symmetry;
  Fukaya category [See also 14J33]
53D40 Floer homology and cohomology, symplectic aspects
53D42 Symplectic field theory; contact homology
53D45 Gromov-Witten invariants, quantum cohomology, Frobenius
  manifolds [See also 14N35]
53D50 Geometric quantization
53D55 Deformation quantization, star products
53D99 None of the above, but in this section
53Zxx **Applications to physics**
53Z05 Applications to physics
53Z99 None of the above, but in this section

[MSC Source Date: Monday 21 December 2009 09:49]

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] {For ultrafilters, see 54D80}

54A35   Consistency and independence results [See also 03E35]

54A40   Fuzzy topology [See also 03E72]

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   Linearly ordered topological spaces, generalized ordered spaces, and 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, 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, 37Bxx]

54H25   Fixed-point and coincidence theorems [See also 47H10, 55M20]

54H99   None of the above, but in this section

54Jxx   **Nonstandard topology [See also 03H05]**

54J05   Nonstandard topology [See also 03H05]

54J99   None of the above, but in this section

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]

55N32   Orbifold cohomology

55N33   Intersection homology and cohomology

55N34   Elliptic 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
55P43 Spectra with additional structure (E_∞, A_∞, ring spectra, etc.)
55P45 H-spaces and duals
55P47 Infinite loop spaces
55P48 Loop space machines, operads [See also 18D50]
55P50 String topology
55P55 Shape theory [See also 54C56, 55Q07]
55P57 Proper homotopy theory
55P60 Localization and completion
55P62 Rational homotopy theory
55P65 Homotopy functors
55P91 Equivariant homotopy theory [See also 19L47]
55P92 Relations between equivariant and nonequivariant homotopy theory
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
55Q35 Operations in homotopy groups
55Q40 Homotopy groups of spheres
55Q45 Stable homotopy of spheres
55Q50 J-morphism [See also 19L20]
55Q51 v_n-periodicity
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 bundles
55R35 Classifying spaces of groups and H-spaces
55R37 Maps between classifying 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
55R70 Fibrewise topology
55R80 Discriminantal varieties, configuration spaces
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 Simplicial sets and complexes
55U15 Chain complexes
55U20 Universal coefficient theorems, Bockstein operator
55U25 Homology of a product, Künneth formula
55U30 Duality
55U35 Abstract and axiomatic homotopy theory
55U40 Topological categories, foundations of homotopy theory
55U99 None of the above, but in this section
57-XX **MANIFOLDS AND CELL COMPLEXES {For complex manifolds, see 32Qxx}**
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}
57M27 Invariants of knots and 3-manifolds
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 ($4 < n < \infty$)
57N16 Geometric structures on manifolds [See also 57M50]
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

[MSC Source Date: Monday 21 December 2009 09:49]

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.)
57R17 Symplectic and contact topology
57R18 Topology and geometry of orbifolds
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, 37C10, 93B05]
57R30 Foliations; geometric theory
57R32 Classifying spaces for foliations; Gelfand-Fuks cohomology [See also 58H10]
57R35 Differentiable mappings
57R40 Embeddings
57R42 Immersions
57R45 Singularities of differentiable mappings
57R50 Diffeomorphisms
57R52 Isotopy
57R55 Differentiable structures
57R56 Topological quantum field theories
57R57 Applications of global analysis to structures on manifolds, Donaldson and Seiberg-Witten invariants [See also 58–XX]
57R58 Floer homology
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, 37–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 16T05]
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, 32Wxx, 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 [See also 32Cxx]**
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)
58A32 Natural bundles
58A35 Stratified sets [See also 32S60]
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]
58B32 Geometry of quantum groups
58B34 Noncommutative geometry (à la Connes)
58B99 None of the above, but in this section
58Cxx **Calculus on manifolds; nonlinear operators [See also 46Txx, 47Hxx, 47Jxx]**
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
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 47J10, 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) [See also 46Txx, 53Cxx]**
58D05 Groups of diffeomorphisms and homeomorphisms as manifolds [See also 22E65, 57S05]
58D07 Groups and semigroups of nonlinear operators [See also 17B65, 47H20]
58D10 Spaces of imbeddings and immersions
58D15 Manifolds of mappings [See also 46T10, 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, 46T12]
58D25 Equations in function spaces; evolution equations [See also 34Gxx, 35K90, 35L90, 35R15, 37Lxx, 47Jxx]
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) [See also 49Q05]

[MSC Source Date: Monday 21 December 2009 09:49]

58E15	Application to extremal problems in several variables; Yang-Mills functionals [See also 81T13], etc.
58E17	Pareto optimality, etc., applications to economics [See also 90C29]
58E20	Harmonic maps [See also 53C43], etc.
58E25	Applications to control theory [See also 49–XX, 93–XX]
58E30	Variational principles
58E35	Variational inequalities (global problems)
58E40	Group actions
58E50	Applications
58E99	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, Gelfand-Fuks, etc.) [See also 57R32]
58H15	Deformations of structures [See also 32Gxx, 58J10]
58H99	None of the above, but in this section
58Jxx	**Partial differential equations on manifolds; differential operators [See also 32Wxx, 35–XX, 53Cxx]**
58J05	Elliptic equations on manifolds, general theory [See also 35–XX]
58J10	Differential complexes [See also 35Nxx]; elliptic complexes
58J15	Relations with hyperfunctions
58J20	Index theory and related fixed point theorems [See also 19K56, 46L80]
58J22	Exotic index theories [See also 19K56, 46L05, 46L10, 46L80, 46M20]
58J26	Elliptic genera
58J28	Eta-invariants, Chern-Simons invariants
58J30	Spectral flows
58J32	Boundary value problems on manifolds
58J35	Heat and other parabolic equation methods
58J37	Perturbations; asymptotics
58J40	Pseudodifferential and Fourier integral operators on manifolds [See also 35Sxx]
58J42	Noncommutative global analysis, noncommutative residues
58J45	Hyperbolic equations [See also 35Lxx]
58J47	Propagation of singularities; initial value problems
58J50	Spectral problems; spectral geometry; scattering theory [See also 35Pxx]
58J51	Relations between spectral theory and ergodic theory, e.g. quantum unique ergodicity
58J52	Determinants and determinant bundles, analytic torsion
58J53	Isospectrality
58J55	Bifurcation [See also 35B32]
58J60	Relations with special manifold structures (Riemannian, Finsler, etc.)
58J65	Diffusion processes and stochastic analysis on manifolds [See also 35R60, 60H10, 60J60]
58J70	Invariance and symmetry properties [See also 35A30]
58J72	Correspondences and other transformation methods (e.g. Lie-Bäcklund) [See also 35A22]
58J90	Applications
58J99	None of the above, but in this section
58Kxx	**Theory of singularities and catastrophe theory [See also 32Sxx, 37–XX]**
58K05	Critical points of functions and mappings
58K10	Monodromy
58K15	Topological properties of mappings
58K20	Algebraic and analytic properties of mappings
58K25	Stability
58K30	Global theory
58K35	Catastrophe theory
58K40	Classification; finite determinacy of map germs
58K45	Singularities of vector fields, topological aspects
58K50	Normal forms
58K55	Asymptotic behavior
58K60	Deformation of singularities
58K65	Topological invariants
58K70	Symmetries, equivariance
58K99	None of the above, but in this section
58Zxx	**Applications to physics**
58Z05	Applications to physics
58Z99	None of the above, but in this section
60–XX	**PROBABILITY THEORY AND STOCHASTIC PROCESSES {For additional applications, see 11Kxx, 62–XX, 90–XX, 91–XX, 92–XX, 93–XX, 94–XX}**
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.
60–08	Computational methods (not classified at a more specific level) [See also 65C50]
60Axx	**Foundations of probability theory**
60A05	Axioms; other general questions
60A10	Probabilistic measure theory {For ergodic theory, see 28Dxx and 60Fxx}
60A86	Fuzzy probability
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 or semigroups, Fourier transforms, factorization
60B20	Random matrices (probabilistic aspects; for algebraic aspects see 15B52)
60B99	None of the above, but in this section
60Cxx	**Combinatorial probability**
60C05	Combinatorial probability
60C99	None of the above, but in this section
60Dxx	**Geometric probability and stochastic geometry [See also 52A22, 53C65]**
60D05	Geometric probability and stochastic geometry [See also 52A22, 53C65]
60D99	None of the above, but in this section
60Exx	**Distribution theory [See also 62Exx, 62Hxx]**
60E05	Distributions: general theory
60E07	Infinitely divisible distributions; stable distributions
60E10	Characteristic functions; other transforms
60E15	Inequalities; stochastic orderings
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
60G22	Fractional processes, including fractional Brownian motion
60G25	Prediction theory [See also 62M20]
60G30	Continuity and singularity of induced measures
60G35	Signal detection and filtering [See also 62M20, 93E10, 93E11, 94Axx]
60G40	Stopping times; optimal stopping problems; gambling theory [See also 62L15, 91A60]
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; random walks
60G51	Processes with independent increments; Lévy processes
60G52	Stable processes
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 58J65]**
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.)

60H35	Computational methods for stochastic equations [See also 65C30]
60H40	White noise theory
60H99	None of the above, but in this section
60Jxx	**Markov processes**
60J05	Discrete-time Markov processes on general state spaces
60J10	Markov chains (discrete-time Markov processes on discrete state spaces)
60J20	Applications of Markov chains and discrete-time Markov processes on general state spaces (social mobility, learning theory, industrial processes, etc.) [See also 90B30, 91D10, 91D35, 91E40]
60J22	Computational methods in Markov chains [See also 65C40]
60J25	Continuous-time Markov processes on general state spaces
60J27	Continuous-time Markov processes on discrete state spaces
60J28	Applications of continuous-time Markov processes on discrete state spaces
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 58J65]
60J65	Brownian motion [See also 58J65]
60J67	Stochastic (Schramm-)Loewner evolution (SLE)
60J68	Superprocesses
60J70	Applications of Brownian motions and 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]
60K37	Processes in random environments
60K40	Other physical applications of random processes
60K99	None of the above, but in this section
62-XX	**STATISTICS**
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	**Foundational and philosophical topics**
62A01	Foundations and philosophical topics
62A86	Fuzzy analysis in statistics
62A99	None of the above, but in this section
62Bxx	**Sufficiency and information**
62B05	Sufficient statistics and fields
62B10	Information-theoretic topics [See also 94A17]
62B15	Theory of statistical experiments
62B86	Fuzziness, sufficiency, and information
62B99	None of the above, but in this section
62Cxx	**Decision theory [See also 90B50, 91B06; for game theory, see 91A35]**
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
62C86	Decision theory and fuzziness
62C99	None of the above, but in this section

62Dxx	**Sampling theory, sample surveys**
62D05	Sampling theory, sample surveys
62D99	None of the above, but in this section
62Exx	**Distribution theory [See also 60Exx]**
62E10	Characterization and structure theory
62E15	Exact distribution theory
62E17	Approximations to distributions (nonasymptotic)
62E20	Asymptotic distribution theory
62E86	Fuzziness in connection with the topics on distributions in this section
62E99	None of the above, but in this section
62Fxx	**Parametric inference**
62F03	Hypothesis testing
62F05	Asymptotic properties of tests
62F07	Ranking and selection
62F10	Point estimation
62F12	Asymptotic properties of estimators
62F15	Bayesian inference
62F25	Tolerance and confidence regions
62F30	Inference under constraints
62F35	Robustness and adaptive procedures
62F40	Bootstrap, jackknife and other resampling methods
62F86	Parametric inference and fuzziness
62F99	None of the above, but in this section
62Gxx	**Nonparametric inference**
62G05	Estimation
62G07	Density estimation
62G08	Nonparametric regression
62G09	Resampling methods
62G10	Hypothesis testing
62G15	Tolerance and confidence regions
62G20	Asymptotic properties
62G30	Order statistics; empirical distribution functions
62G32	Statistics of extreme values; tail inference
62G35	Robustness
62G86	Nonparametric inference and fuzziness
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 tables
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, 91C20]
62H35	Image analysis
62H86	Multivariate analysis and fuzziness
62H99	None of the above, but in this section
62Jxx	**Linear inference, regression**
62J02	General nonlinear regression
62J05	Linear regression
62J07	Ridge regression; shrinkage estimators
62J10	Analysis of variance and covariance
62J12	Generalized linear models
62J15	Paired and multiple comparisons
62J20	Diagnostics
62J86	Fuzziness, and linear inference and regression
62J99	None of the above, but in this section
62Kxx	**Design of experiments [See also 05Bxx]**
62K05	Optimal designs
62K10	Block designs
62K15	Factorial designs
62K20	Response surface designs
62K25	Robust parameter designs
62K86	Fuzziness and design of experiments
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, 91A60]
62L20	Stochastic approximation
62L86	Fuzziness and sequential methods
62L99	None of the above, but in this section

[MSC Source Date: Monday 21 December 2009 09:49]

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 91B84]
62M15 Spectral analysis
62M20 Prediction [See also 60G25]; filtering [See also 60G35, 93E10, 93E11]
62M30 Spatial processes
62M40 Random fields; image analysis
62M45 Neural nets and related approaches
62M86 Inference from stochastic processes and fuzziness
62M99 None of the above, but in this section
62Nxx **Survival analysis and censored data**
62N01 Censored data models
62N02 Estimation
62N03 Testing
62N05 Reliability and life testing [See also 90B25]
62N86 Fuzziness, and survival analysis and censored data
62N99 None of the above, but in this section
62Pxx **Applications** [See also **90–XX, 91–XX, 92–XX**]
62P05 Applications to actuarial sciences and financial mathematics
62P10 Applications to biology and medical sciences
62P12 Applications to environmental and related topics
62P15 Applications to psychology
62P20 Applications to economics [See also 91Bxx]
62P25 Applications to social sciences
62P30 Applications in engineering and industry
62P35 Applications to physics
62P99 None of the above, but in this section
62Qxx **Statistical tables**
62Q05 Statistical tables
62Q99 None of the above, but in this section
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.
65Axx **Tables**
65A05 Tables
65A99 None of the above, but in this section
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 **Probabilistic methods, simulation and stochastic differential equations** {For theoretical aspects, see **68U20** and **60H35**}
65C05 Monte Carlo methods
65C10 Random number generation
65C20 Models, numerical methods [See also 68U20]
65C30 Stochastic differential and integral equations
65C35 Stochastic particle methods [See also 82C80]
65C40 Computational Markov chains
65C50 Other computational problems in probability
65C60 Computational problems in statistics
65C99 None of the above, but in this section
65Dxx **Numerical approximation and computational geometry (primarily algorithms)** {For theory, see **41–XX** and **68Uxx**}
65D05 Interpolation
65D07 Splines
65D10 Smoothing, curve fitting
65D15 Algorithms for functional approximation
65D17 Computer aided design (modeling of curves and surfaces) [See also 68U07]
65D18 Computer graphics, image analysis, and computational geometry [See also 51N05, 68U05]
65D19 Computational issues in computer and robotic vision
65D20 Computation of special functions, construction of tables [See also 33F05]
65D25 Numerical differentiation
65D30 Numerical integration
65D32 Quadrature and cubature formulas
65D99 None of the above, but in this section

65Exx **Numerical methods in complex analysis (potential theory, etc.)** {For numerical methods in conformal mapping, see also **30C30**}
65E05 Numerical methods in complex analysis (potential theory, etc.) {For numerical methods in conformal mapping, see also 30C30}
65E99 None of the above, but in this section
65Fxx **Numerical linear algebra**
65F05 Direct methods for linear systems and matrix inversion
65F08 Preconditioners for iterative methods
65F10 Iterative methods for linear systems [See also 65N22]
65F15 Eigenvalues, eigenvectors
65F18 Inverse eigenvalue problems
65F20 Overdetermined systems, pseudoinverses
65F22 Ill-posedness, regularization
65F25 Orthogonalization
65F30 Other matrix algorithms
65F35 Matrix norms, conditioning, scaling [See also 15A12, 15A60]
65F40 Determinants
65F50 Sparse matrices
65F60 Matrix exponential and similar matrix functions
65F99 None of the above, but in this section
65Gxx **Error analysis and interval analysis**
65G20 Algorithms with automatic result verification
65G30 Interval and finite arithmetic
65G40 General methods in interval analysis
65G50 Roundoff error
65G99 None of the above, but in this section
65Hxx **Nonlinear algebraic or transcendental equations**
65H04 Roots of polynomial equations
65H05 Single equations
65H10 Systems of equations
65H17 Eigenvalues, eigenvectors [See also 47Hxx, 47Jxx, 58C40, 58E07, 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
65J08 Abstract evolution equations
65J10 Equations with linear operators (do not use 65Fxx)
65J15 Equations with nonlinear operators (do not use 65Hxx)
65J20 Improperly posed problems; regularization
65J22 Inverse problems
65J99 None of the above, but in this section
65Kxx **Mathematical programming, optimization and variational techniques**
65K05 Mathematical programming methods [See also 90Cxx]
65K10 Optimization and variational techniques [See also 49Mxx, 93B40]
65K15 Numerical methods for variational inequalities and related problems
65K99 None of the above, but in this section
65Lxx **Ordinary differential equations**
65L03 Functional-differential equations
65L04 Stiff equations
65L05 Initial value problems
65L06 Multistep, Runge-Kutta and extrapolation methods
65L07 Numerical investigation of stability of solutions
65L08 Improperly posed problems
65L09 Inverse problems
65L10 Boundary value problems
65L11 Singularly perturbed problems
65L12 Finite difference methods
65L15 Eigenvalue problems
65L20 Stability and convergence of numerical methods
65L50 Mesh generation and refinement
65L60 Finite elements, Rayleigh-Ritz, Galerkin and collocation methods
65L70 Error bounds
65L80 Methods for differential-algebraic equations
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
65M08 Finite volume methods
65M12 Stability and convergence of numerical methods
65M15 Error bounds
65M20 Method of lines
65M22 Solution of discretized equations [See also 65Fxx, 65Hxx]
65M25 Method of characteristics
65M30 Improperly posed problems
65M32 Inverse problems
65M38 Boundary element methods
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
65M75	Probabilistic methods, particle methods, etc.
65M80	Fundamental solutions, Green's function methods, etc.
65M85	Fictitious domain methods
65M99	None of the above, but in this section
65Nxx	**Partial differential equations, boundary value problems**
65N06	Finite difference methods
65N08	Finite volume methods
65N12	Stability and convergence of numerical methods
65N15	Error bounds
65N20	Ill-posed problems
65N21	Inverse problems
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
65N75	Probabilistic methods, particle methods, etc.
65N80	Fundamental solutions, Green's function methods, etc.
65N85	Fictitious domain methods
65N99	None of the above, but in this section
65Pxx	**Numerical problems in dynamical systems [See also 37Mxx]**
65P10	Hamiltonian systems including symplectic integrators
65P20	Numerical chaos
65P30	Bifurcation problems
65P40	Nonlinear stabilities
65P99	None of the above, but in this section
65Qxx	**Difference and functional equations, recurrence relations**
65Q10	Difference equations
65Q20	Functional equations
65Q30	Recurrence relations
65Q99	None of the above, but in this section
65Rxx	**Integral equations, integral transforms**
65R10	Integral transforms
65R20	Integral equations
65R30	Improperly posed problems
65R32	Inverse problems
65R99	None of the above, but in this section
65Sxx	**Graphical methods**
65S05	Graphical methods
65S99	None of the above, but in this section
65Txx	**Numerical methods in Fourier analysis**
65T40	Trigonometric approximation and interpolation
65T50	Discrete and fast Fourier transforms
65T60	Wavelets
65T99	None of the above, but in this section
65Yxx	**Computer aspects of numerical algorithms**
65Y04	Algorithms for computer arithmetic, etc. [See also 68M07]
65Y05	Parallel computation
65Y10	Algorithms for specific classes of architectures
65Y15	Packaged methods
65Y20	Complexity and performance of numerical algorithms [See also 68Q25]
65Y99	None of the above, but in this section
65Zxx	**Applications to physics**
65Z05	Applications to physics
65Z99	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**
68M01	General
68M07	Mathematical problems of computer architecture
68M10	Network design and communication [See also 68R10, 90B18]
68M11	Internet topics [See also 68U35]
68M12	Network protocols

68M14	Distributed systems
68M15	Reliability, testing and fault tolerance [See also 94C12]
68M20	Performance evaluation; queueing; scheduling [See also 60K25, 90Bxx]
68M99	None of the above, but in this section
68Nxx	**Software**
68N01	General
68N15	Programming languages
68N17	Logic programming
68N18	Functional programming and lambda calculus [See also 03B40]
68N19	Other programming techniques (object-oriented, sequential, concurrent, automatic, etc.)
68N20	Compilers and interpreters
68N25	Operating systems
68N30	Mathematical aspects of software engineering (specification, verification, metrics, requirements, etc.)
68N99	None of the above, but in this section
68Pxx	**Theory of data**
68P01	General
68P05	Data structures
68P10	Searching and sorting
68P15	Database theory
68P20	Information storage and retrieval
68P25	Data encryption [See also 94A60, 81P94]
68P30	Coding and information theory (compaction, compression, models of communication, encoding schemes, etc.) [See also 94Axx]
68P99	None of the above, but in this section
68Qxx	**Theory of computing**
68Q01	General
68Q05	Models of computation (Turing machines, etc.) [See also 03D10, 68Q12, 81P68]
68Q10	Modes of computation (nondeterministic, parallel, interactive, probabilistic, etc.) [See also 68Q85]
68Q12	Quantum algorithms and complexity [See also 68Q05, 81P68]
68Q15	Complexity classes (hierarchies, relations among complexity classes, etc.) [See also 03D15, 68Q17, 68Q19]
68Q17	Computational difficulty of problems (lower bounds, completeness, difficulty of approximation, etc.) [See also 68Q15]
68Q19	Descriptive complexity and finite models [See also 03C13]
68Q25	Analysis of algorithms and problem complexity [See also 68W40]
68Q30	Algorithmic information theory (Kolmogorov complexity, etc.) [See also 03D32]
68Q32	Computational learning theory [See also 68T05]
68Q42	Grammars and rewriting systems
68Q45	Formal languages and automata [See also 03D05, 68Q70, 94A45]
68Q55	Semantics [See also 03B70, 06B35, 18C50]
68Q60	Specification and verification (program logics, model checking, etc.) [See also 03B70]
68Q65	Abstract data types; algebraic specification [See also 18C50]
68Q70	Algebraic theory of languages and automata [See also 18B20, 20M35]
68Q80	Cellular automata [See also 37B15]
68Q85	Models and methods for concurrent and distributed computing (process algebras, bisimulation, transition nets, etc.)
68Q87	Probability in computer science (algorithm analysis, random structures, phase transitions, etc.) [See also 68W20, 68W40]
68Q99	None of the above, but in this section
68Rxx	**Discrete mathematics in relation to computer science**
68R01	General
68R05	Combinatorics
68R10	Graph theory (including graph drawing) [See also 05Cxx, 90B10, 90B35, 90C35]
68R15	Combinatorics on words
68R99	None of the above, but in this section
68Txx	**Artificial intelligence**
68T01	General
68T05	Learning and adaptive systems [See also 68Q32, 91E40]
68T10	Pattern recognition, speech recognition {For cluster analysis, see 62H30}
68T15	Theorem proving (deduction, resolution, etc.) [See also 03B35]
68T20	Problem solving (heuristics, search strategies, etc.)
68T27	Logic in artificial intelligence
68T30	Knowledge representation
68T35	Languages and software systems (knowledge-based systems, expert systems, etc.)
68T37	Reasoning under uncertainty
68T40	Robotics [See also 93C85]
68T42	Agent technology
68T45	Machine vision and scene understanding
68T50	Natural language processing [See also 03B65]
68T99	None of the above, but in this section

68Uxx	**Computing methodologies and applications**
68U01	General
68U05	Computer graphics; computational geometry [See also 65D18]
68U07	Computer-aided design [See also 65D17]
68U10	Image processing
68U15	Text processing; mathematical typography
68U20	Simulation [See also 65Cxx]
68U35	Information systems (hypertext navigation, interfaces, decision support, etc.) [See also 68M11]
68U99	None of the above, but in this section
68Wxx	**Algorithms {For numerical algorithms, see 65–XX; for combinatorics and graph theory, see 05C85, 68Rxx}**
68W01	General
68W05	Nonnumerical algorithms
68W10	Parallel algorithms
68W15	Distributed algorithms
68W20	Randomized algorithms
68W25	Approximation algorithms
68W27	Online algorithms
68W30	Symbolic computation and algebraic computation [See also 11Yxx, 12Y05, 13Pxx, 14Qxx, 16Z05, 17–08, 33F10]
68W32	Algorithms on strings
68W35	VLSI algorithms
68W40	Analysis of algorithms [See also 68Q25]
68W99	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 work
70–06	Proceedings, conferences, collections, etc.
70–08	Computational methods
70Axx	**Axiomatics, foundations**
70A05	Axiomatics, foundations
70A99	None of the above, but in this section
70Bxx	**Kinematics [See also 53A17]**
70B05	Kinematics of a particle
70B10	Kinematics of a rigid body
70B15	Mechanisms, robots [See also 68T40, 70Q05, 93C85]
70B99	None of the above, but in this section
70Cxx	**Statics**
70C20	Statics
70C99	None of the above, but in this section
70Exx	**Dynamics of a rigid body and of multibody systems**
70E05	Motion of the gyroscope
70E15	Free motion of a rigid body [See also 70M20]
70E17	Motion of a rigid body with a fixed point
70E18	Motion of a rigid body in contact with a solid surface [See also 70F25]
70E20	Perturbation methods for rigid body dynamics
70E40	Integrable cases of motion
70E45	Higher-dimensional generalizations
70E50	Stability problems
70E55	Dynamics of multibody systems
70E60	Robot dynamics and control [See also 68T40, 70Q05, 93C85]
70E99	None of the above, but in this section
70Fxx	**Dynamics of a system of particles, including celestial mechanics**
70F05	Two-body problems
70F07	Three-body problems
70F10	n-body problems
70F15	Celestial mechanics
70F16	Collisions in celestial mechanics, regularization
70F17	Inverse problems
70F20	Holonomic systems
70F25	Nonholonomic systems
70F35	Collision of rigid or pseudo-rigid bodies
70F40	Problems with friction
70F45	Infinite particle systems
70F99	None of the above, but in this section
70Gxx	**General models, approaches, and methods [See also 37–XX]**
70G10	Generalized coordinates; event, impulse-energy, configuration, state, or phase space
70G40	Topological and differential-topological methods
70G45	Differential-geometric methods (tensors, connections, symplectic, Poisson, contact, Riemannian, nonholonomic, etc.) [See also 53Cxx, 53Dxx, 58Axx]
70G55	Algebraic geometry methods
70G60	Dynamical systems methods
70G65	Symmetries, Lie-group and Lie-algebra methods
70G70	Functional-analytic methods
70G75	Variational methods
70G99	None of the above, but in this section
70Hxx	**Hamiltonian and Lagrangian mechanics [See also 37Jxx]**
70H03	Lagrange's equations
70H05	Hamilton's equations
70H06	Completely integrable systems and methods of integration
70H07	Nonintegrable systems
70H08	Nearly integrable Hamiltonian systems, KAM theory
70H09	Perturbation theories
70H11	Adiabatic invariants
70H12	Periodic and almost periodic solutions
70H14	Stability problems
70H15	Canonical and symplectic transformations
70H20	Hamilton-Jacobi equations
70H25	Hamilton's principle
70H30	Other variational principles
70H33	Symmetries and conservation laws, reverse symmetries, invariant manifolds and their bifurcations, reduction
70H40	Relativistic dynamics
70H45	Constrained dynamics, Dirac's theory of constraints [See also 70F20, 70F25, 70Gxx]
70H50	Higher-order theories
70H99	None of the above, but in this section
70Jxx	**Linear vibration theory**
70J10	Modal analysis
70J25	Stability
70J30	Free motions
70J35	Forced motions
70J40	Parametric resonances
70J50	Systems arising from the discretization of structural vibration problems
70J99	None of the above, but in this section
70Kxx	**Nonlinear dynamics [See also 34Cxx, 37–XX]**
70K05	Phase plane analysis, limit cycles
70K20	Stability
70K25	Free motions
70K28	Parametric resonances
70K30	Nonlinear resonances
70K40	Forced motions
70K42	Equilibria and periodic trajectories
70K43	Quasi-periodic motions and invariant tori
70K44	Homoclinic and heteroclinic trajectories
70K45	Normal forms
70K50	Bifurcations and instability
70K55	Transition to stochasticity (chaotic behavior) [See also 37D45]
70K60	General perturbation schemes
70K65	Averaging of perturbations
70K70	Systems with slow and fast motions
70K75	Nonlinear modes
70K99	None of the above, but in this section
70Lxx	**Random vibrations [See also 74H50]**
70L05	Random vibrations [See also 74H50]
70L99	None of the above, but in this section
70Mxx	**Orbital mechanics**
70M20	Orbital mechanics
70M99	None of the above, but in this section
70Pxx	**Variable mass, rockets**
70P05	Variable mass, rockets
70P99	None of the above, but in this section
70Qxx	**Control of mechanical systems [See also 60Gxx, 60Jxx]**
70Q05	Control of mechanical systems
70Q99	None of the above, but in this section
70Sxx	**Classical field theories [See also 37Kxx, 37Lxx, 78–XX, 81Txx, 83–XX]**
70S05	Lagrangian formalism and Hamiltonian formalism
70S10	Symmetries and conservation laws
70S15	Yang-Mills and other gauge theories
70S20	More general nonquantum field theories
70S99	None of the above, but in this section

74-XX   **MECHANICS OF DEFORMABLE SOLIDS**
- 74-00   General reference works (handbooks, dictionaries, bibliographies, etc.)
- 74-01   Instructional exposition (textbooks, tutorial papers, etc.)
- 74-02   Research exposition (monographs, survey articles)
- 74-03   Historical (must also be assigned at least one classification number from Section 01)
- 74-04   Explicit machine computation and programs (not the theory of computation or programming)
- 74-05   Experimental work
- 74-06   Proceedings, conferences, collections, etc.

74Axx   **Generalities, axiomatics, foundations of continuum mechanics of solids**
- 74A05   Kinematics of deformation
- 74A10   Stress
- 74A15   Thermodynamics
- 74A20   Theory of constitutive functions
- 74A25   Molecular, statistical, and kinetic theories
- 74A30   Nonsimple materials
- 74A35   Polar materials
- 74A40   Random materials and composite materials
- 74A45   Theories of fracture and damage
- 74A50   Structured surfaces and interfaces, coexistent phases
- 74A55   Theories of friction (tribology)
- 74A60   Micromechanical theories
- 74A65   Reactive materials
- 74A99   None of the above, but in this section

74Bxx   **Elastic materials**
- 74B05   Classical linear elasticity
- 74B10   Linear elasticity with initial stresses
- 74B15   Equations linearized about a deformed state (small deformations superposed on large)
- 74B20   Nonlinear elasticity
- 74B99   None of the above, but in this section

74Cxx   **Plastic materials, materials of stress-rate and internal-variable type**
- 74C05   Small-strain, rate-independent theories (including rigid-plastic and elasto-plastic materials)
- 74C10   Small-strain, rate-dependent theories (including theories of viscoplasticity)
- 74C15   Large-strain, rate-independent theories (including nonlinear plasticity)
- 74C20   Large-strain, rate-dependent theories
- 74C99   None of the above, but in this section

74Dxx   **Materials of strain-rate type and history type, other materials with memory (including elastic materials with viscous damping, various viscoelastic materials)**
- 74D05   Linear constitutive equations
- 74D10   Nonlinear constitutive equations
- 74D99   None of the above, but in this section

74Exx   **Material properties given special treatment**
- 74E05   Inhomogeneity
- 74E10   Anisotropy
- 74E15   Crystalline structure
- 74E20   Granularity
- 74E25   Texture
- 74E30   Composite and mixture properties
- 74E35   Random structure
- 74E40   Chemical structure
- 74E99   None of the above, but in this section

74Fxx   **Coupling of solid mechanics with other effects**
- 74F05   Thermal effects
- 74F10   Fluid-solid interactions (including aero- and hydro-elasticity, porosity, etc.)
- 74F15   Electromagnetic effects
- 74F20   Mixture effects
- 74F25   Chemical and reactive effects
- 74F99   None of the above, but in this section

74Gxx   **Equilibrium (steady-state) problems**
- 74G05   Explicit solutions
- 74G10   Analytic approximation of solutions (perturbation methods, asymptotic methods, series, etc.)
- 74G15   Numerical approximation of solutions
- 74G20   Local existence of solutions (near a given solution)
- 74G25   Global existence of solutions
- 74G30   Uniqueness of solutions
- 74G35   Multiplicity of solutions
- 74G40   Regularity of solutions
- 74G45   Bounds for solutions
- 74G50   Saint-Venant's principle
- 74G55   Qualitative behavior of solutions
- 74G60   Bifurcation and buckling
- 74G65   Energy minimization
- 74G70   Stress concentrations, singularities
- 74G75   Inverse problems
- 74G99   None of the above, but in this section

74Hxx   **Dynamical problems**
- 74H05   Explicit solutions
- 74H10   Analytic approximation of solutions (perturbation methods, asymptotic methods, series, etc.)
- 74H15   Numerical approximation of solutions
- 74H20   Existence of solutions
- 74H25   Uniqueness of solutions
- 74H30   Regularity of solutions
- 74H35   Singularities, blowup, stress concentrations
- 74H40   Long-time behavior of solutions
- 74H45   Vibrations
- 74H50   Random vibrations
- 74H55   Stability
- 74H60   Dynamical bifurcation
- 74H65   Chaotic behavior
- 74H99   None of the above, but in this section

74Jxx   **Waves**
- 74J05   Linear waves
- 74J10   Bulk waves
- 74J15   Surface waves
- 74J20   Wave scattering
- 74J25   Inverse problems
- 74J30   Nonlinear waves
- 74J35   Solitary waves
- 74J40   Shocks and related discontinuities
- 74J99   None of the above, but in this section

74Kxx   **Thin bodies, structures**
- 74K05   Strings
- 74K10   Rods (beams, columns, shafts, arches, rings, etc.)
- 74K15   Membranes
- 74K20   Plates
- 74K25   Shells
- 74K30   Junctions
- 74K35   Thin films
- 74K99   None of the above, but in this section

74Lxx   **Special subfields of solid mechanics**
- 74L05   Geophysical solid mechanics [See also 86–XX]
- 74L10   Soil and rock mechanics
- 74L15   Biomechanical solid mechanics [See also 92C10]
- 74L99   None of the above, but in this section

74Mxx   **Special kinds of problems**
- 74M05   Control, switches and devices ("smart materials") [See also 93Cxx]
- 74M10   Friction
- 74M15   Contact
- 74M20   Impact
- 74M25   Micromechanics
- 74M99   None of the above, but in this section

74Nxx   **Phase transformations in solids [See also 74A50, 80Axx, 82B26, 82C26]**
- 74N05   Crystals
- 74N10   Displacive transformations
- 74N15   Analysis of microstructure
- 74N20   Dynamics of phase boundaries
- 74N25   Transformations involving diffusion
- 74N30   Problems involving hysteresis
- 74N99   None of the above, but in this section

74Pxx   **Optimization [See also 49Qxx]**
- 74P05   Compliance or weight optimization
- 74P10   Optimization of other properties
- 74P15   Topological methods
- 74P20   Geometrical methods
- 74P99   None of the above, but in this section

74Qxx   **Homogenization, determination of effective properties**
- 74Q05   Homogenization in equilibrium problems
- 74Q10   Homogenization and oscillations in dynamical problems
- 74Q15   Effective constitutive equations
- 74Q20   Bounds on effective properties
- 74Q99   None of the above, but in this section

74Rxx   **Fracture and damage**
- 74R05   Brittle damage
- 74R10   Brittle fracture
- 74R15   High-velocity fracture
- 74R20   Anelastic fracture and damage
- 74R99   None of the above, but in this section

[MSC Source Date: Monday 21 December 2009 09:49]

74Sxx	Numerical methods [See also **65–XX**, **74G15**, **74H15**]		76Fxx	Turbulence [See also **37–XX**, **60Gxx**, **60Jxx**]

74Sxx   Numerical methods [See also **65–XX**, **74G15**, **74H15**]
74S05   Finite element methods
74S10   Finite volume methods
74S15   Boundary element methods
74S20   Finite difference methods
74S25   Spectral and related methods
74S30   Other numerical methods
74S60   Stochastic methods
74S70   Complex variable methods
74S99   None of the above, but in this section

76–XX   FLUID MECHANICS {For general continuum mechanics, see 74Axx, or other parts of 74–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 work
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]
76A20   Thin fluid films
76A25   Superfluids (classical aspects)
76A99   None of the above, but in this section
76Bxx   Incompressible inviscid fluids
76B03   Existence, uniqueness, and regularity theory [See also 35Q35]
76B07   Free-surface potential flows
76B10   Jets and cavities, cavitation, free-streamline theory, water-entry problems, airfoil and hydrofoil theory, sloshing
76B15   Water waves, gravity waves; dispersion and scattering, nonlinear interaction [See also 35Q30]
76B20   Ship waves
76B25   Solitary waves [See also 35C11]
76B45   Capillarity (surface tension) [See also 76D45]
76B47   Vortex flows
76B55   Internal waves
76B60   Atmospheric waves [See also 86A10]
76B65   Rossby waves [See also 86A05, 86A10]
76B70   Stratification effects in inviscid fluids
76B75   Flow control and optimization [See also 49Q10, 93C20, 93C95]
76B99   None of the above, but in this section
76Dxx   Incompressible viscous fluids
76D03   Existence, uniqueness, and regularity theory [See also 35Q30]
76D05   Navier-Stokes equations [See also 35Q30]
76D06   Statistical solutions of Navier-Stokes and related equations [See also 60H30, 76M35]
76D07   Stokes and related (Oseen, etc.) flows
76D08   Lubrication theory
76D09   Viscous-inviscid interaction
76D10   Boundary-layer theory, separation and reattachment, higher-order effects
76D17   Viscous vortex flows
76D25   Wakes and jets
76D27   Other free-boundary flows; Hele-Shaw flows
76D33   Waves
76D45   Capillarity (surface tension) [See also 76B45]
76D50   Stratification effects in viscous fluids
76D55   Flow control and optimization [See also 49Q10, 93C20, 93C95]
76D99   None of the above, but in this section
76Exx   Hydrodynamic stability
76E05   Parallel shear flows
76E06   Convection
76E07   Rotation
76E09   Stability and instability of nonparallel flows
76E15   Absolute and convective instability and stability
76E17   Interfacial stability and instability
76E19   Compressibility effects
76E20   Stability and instability of geophysical and astrophysical flows
76E25   Stability and instability of magnetohydrodynamic and electrohydrodynamic flows
76E30   Nonlinear effects
76E99   None of the above, but in this section

76Fxx   Turbulence [See also **37–XX**, **60Gxx**, **60Jxx**]
76F02   Fundamentals
76F05   Isotropic turbulence; homogeneous turbulence
76F06   Transition to turbulence
76F10   Shear flows
76F20   Dynamical systems approach to turbulence [See also 37–XX]
76F25   Turbulent transport, mixing
76F30   Renormalization and other field-theoretical methods [See also 81T99]
76F35   Convective turbulence [See also 76E15, 76Rxx]
76F40   Turbulent boundary layers
76F45   Stratification effects
76F50   Compressibility effects
76F55   Statistical turbulence modeling [See also 76M35]
76F60 k-ε modeling
76F65   Direct numerical and large eddy simulation of turbulence
76F70   Control of turbulent flows
76F99   None of the above, but in this section
76Gxx   General aerodynamics and subsonic flows
76G25   General aerodynamics and subsonic flows
76G99   None of the above, but in this section
76Hxx   Transonic flows
76H05   Transonic flows
76H99   None of the above, but in this section
76Jxx   Supersonic flows
76J20   Supersonic flows
76J99   None of the above, but in this section
76Kxx   Hypersonic flows
76K05   Hypersonic flows
76K99   None of the above, but in this section
76Lxx   Shock waves and blast waves [See also **35L67**]
76L05   Shock waves and blast waves [See also 35L67]
76L99   None of the above, but in this section
76Mxx   Basic methods in fluid mechanics [See also **65–XX**]
76M10   Finite element methods
76M12   Finite volume methods
76M15   Boundary element methods
76M20   Finite difference methods
76M22   Spectral methods
76M23   Vortex methods
76M25   Other numerical methods
76M27   Visualization algorithms
76M28   Particle methods and lattice-gas methods
76M30   Variational methods
76M35   Stochastic analysis
76M40   Complex-variables methods
76M45   Asymptotic methods, singular perturbations
76M50   Homogenization
76M55   Dimensional analysis and similarity
76M60   Symmetry analysis, Lie group and algebra methods
76M99   None of the above, but in this section
76Nxx   Compressible fluids and gas dynamics, general
76N10   Existence, uniqueness, and regularity theory [See also 35L60, 35L65, 35Q30]
76N15   Gas dynamics, general
76N17   Viscous-inviscid interaction
76N20   Boundary-layer theory
76N25   Flow control and optimization
76N99   None of the above, but in this section
76Pxx   Rarefied gas flows, Boltzmann equation [See also **82B40**, **82C40**, **82D05**]
76P05   Rarefied gas flows, Boltzmann equation [See also 82B40, 82C40, 82D05]
76P99   None of the above, but in this section
76Qxx   Hydro- and aero-acoustics
76Q05   Hydro- and aero-acoustics
76Q99   None of the above, but in this section
76Rxx   Diffusion and convection
76R05   Forced convection
76R10   Free convection
76R50   Diffusion [See also 60J60]
76R99   None of the above, but in this section
76Sxx   Flows in porous media; filtration; seepage
76S05   Flows in porous media; filtration; seepage
76S99   None of the above, but in this section
76Txx   Two-phase and multiphase flows
76T10   Liquid-gas two-phase flows, bubbly flows
76T15   Dusty-gas two-phase flows
76T20   Suspensions
76T25   Granular flows [See also 74C99, 74E20]
76T30   Three or more component flows

[MSC Source Date: Monday 21 December 2009 09:49]

76T99 None of the above, but in this section
76Uxx **Rotating fluids**
76U05 Rotating fluids
76U99 None of the above, but in this section
76Vxx **Reaction effects in flows [See also 80A32]**
76V05 Reaction effects in flows [See also 80A32]
76V99 None of the above, but in this section
76Wxx **Magnetohydrodynamics and electrohydrodynamics**
76W05 Magnetohydrodynamics and electrohydrodynamics
76W99 None of the above, but in this section
76Xxx **Ionized gas flow in electromagnetic fields; plasmic flow [See also 82D10]**
76X05 Ionized gas flow in electromagnetic fields; plasmic flow [See also 82D10]
76X99 None of the above, but in this section
76Yxx **Quantum hydrodynamics and relativistic hydrodynamics [See also 82D50, 83C55, 85A30]**
76Y05 Quantum hydrodynamics and relativistic hydrodynamics [See also 82D50, 83C55, 85A30]
76Y99 None of the above, but in this section
76Zxx **Biological fluid mechanics [See also 74F10, 74L15, 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 work
78-06 Proceedings, conferences, collections, etc.
78Axx **General**
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
78A37 Ion traps
78A40 Waves and radiation
78A45 Diffraction, scattering [See also 34E20 for WKB methods]
78A46 Inverse scattering problems
78A48 Composite media; random media
78A50 Antennas, wave-guides
78A55 Technical applications
78A57 Electrochemistry
78A60 Lasers, masers, optical bistability, nonlinear optics [See also 81V80]
78A70 Biological applications [See also 91D30, 92C30]
78A97 Mathematically heuristic optics and electromagnetic theory (must also be assigned at least one other classification number in this section)
78A99 Miscellaneous topics
78Mxx **Basic methods**
78M05 Method of moments
78M10 Finite element methods
78M12 Finite volume methods, finite integration techniques
78M15 Boundary element methods
78M16 Multipole methods
78M20 Finite difference methods
78M22 Spectral methods
78M25 Other numerical methods
78M30 Variational methods
78M31 Monte Carlo methods
78M32 Neural and heuristic methods
78M34 Model reduction
78M35 Asymptotic analysis
78M40 Homogenization
78M50 Optimization
78M99 None of the above, but in this section

80-XX **CLASSICAL THERMODYNAMICS, HEAT TRANSFER {For thermodynamics of solids, see 74A15}**
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 work
80-06 Proceedings, conferences, collections, etc.
80Axx **Thermodynamics and heat transfer**
80A05 Foundations
80A10 Classical thermodynamics, including relativistic
80A17 Thermodynamics of continua [See also 74A15]
80A20 Heat and mass transfer, heat flow
80A22 Stefan problems, phase changes, etc. [See also 74Nxx]
80A23 Inverse problems
80A25 Combustion
80A30 Chemical kinetics [See also 76V05, 92C45, 92E20]
80A32 Chemically reacting flows [See also 92C45, 92E20]
80A50 Chemistry (general) [See mainly 92Exx]
80A99 None of the above, but in this section
80Mxx **Basic methods**
80M10 Finite element methods
80M12 Finite volume methods
80M15 Boundary element methods
80M20 Finite difference methods
80M22 Spectral methods
80M25 Other numerical methods
80M30 Variational methods
80M31 Monte Carlo methods
80M35 Asymptotic analysis
80M40 Homogenization
80M50 Optimization
80M99 None of the above, but in this section

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; quantum logic [See also 03G12, 06C15]
81P13 Contextuality
81P15 Quantum measurement theory
81P16 Quantum state spaces, operational and probabilistic concepts
81P20 Stochastic mechanics (including stochastic electrodynamics)
81P40 Quantum coherence, entanglement, quantum correlations
81P45 Quantum information, communication, networks [See also 94A15, 94A17]
81P50 Quantum state estimation, approximate cloning
81P68 Quantum computation [See also 68Q05, 68Q12]
81P70 Quantum coding (general)
81P94 Quantum cryptography [See also 94A60]
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 equations of quantum mechanics
81Q10 Selfadjoint operator theory in quantum theory, including spectral analysis
81Q12 Non-selfadjoint operator theory in quantum theory
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]
81Q35 Quantum mechanics on special spaces: manifolds, fractals, graphs, etc.
81Q37 Quantum dots, waveguides, ratchets, etc.
81Q40 Bethe-Salpeter and other integral equations
81Q50 Quantum chaos [See also 37Dxx]

81Q60 Supersymmetry and quantum mechanics
81Q65 Alternative quantum mechanics
81Q70 Differential-geometric methods, including holonomy, Berry and Hannay phases, etc.
81Q80 Special quantum systems, such as solvable systems
81Q93 Quantum control
81Q99 None of the above, but in this section
81Rxx **Groups and algebras in quantum theory**
81R05 Finite-dimensional groups and algebras motivated by physics and their representations [See also 20C35, 22E70]
81R10 Infinite-dimensional groups and algebras motivated by physics, including Virasoro, Kac-Moody, W-algebras and other current algebras and their representations [See also 17B65, 17B67, 22E65, 22E67, 22E70]
81R12 Relations with integrable systems [See also 17Bxx, 37J35]
81R15 Operator algebra methods [See also 46Lxx, 81T05]
81R20 Covariant wave equations
81R25 Spinor and twistor methods [See also 32L25]
81R30 Coherent states [See also 22E45]; squeezed states [See also 81V80]
81R40 Symmetry breaking
81R50 Quantum groups and related algebraic methods [See also 16T20, 17B37]
81R60 Noncommutative geometry
81R99 None of the above, but in this section
81Sxx **General quantum mechanics and problems of quantization**
81S05 Canonical quantization, commutation relations and statistics
81S10 Geometry and quantization, symplectic methods [See also 53D50]
81S20 Stochastic quantization
81S22 Open systems, reduced dynamics, master equations, decoherence [See also 82C31]
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 [See also 70Sxx]**
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
81T28 Thermal quantum field theory [See also 82B30]
81T30 String and superstring theories; other extended objects (e.g., branes) [See also 83E30]
81T40 Two-dimensional field theories, conformal field theories, etc.
81T45 Topological field theories [See also 57R56, 58Dxx]
81T50 Anomalies
81T55 Casimir effect
81T60 Supersymmetric field theories
81T70 Quantization in field theory; cohomological methods [See also 58D29]
81T75 Noncommutative geometry methods [See also 46L85, 46L87, 58B34]
81T80 Simulation and numerical modeling
81T99 None of the above, but in this section
81Uxx **Scattering theory [See also 34A55, 34L25, 34L40, 35P25, 47A40]**
81U05 2-body potential scattering theory [See also 34E20 for WKB methods]
81U10 n-body potential scattering theory
81U15 Exactly and quasi-solvable systems
81U20 S-matrix theory, etc.
81U30 Dispersion theory, dispersion relations
81U35 Inelastic and multichannel scattering
81U40 Inverse scattering problems
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 [See also 83Cxx and 83Exx]
81V19 Other fundamental interactions
81V22 Unified theories
81V25 Other elementary particle theory
81V35 Nuclear physics
81V45 Atomic physics
81V55 Molecular physics [See also 92E10]
81V65 Quantum dots [See also 82D20]

81V70 Many-body theory; quantum Hall effect
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.) and systems on graphs
82B21 Continuum models (systems of particles, etc.)
82B23 Exactly solvable models; Bethe ansatz
82B24 Interface problems; diffusion-limited aggregation
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 60G50, 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 None of the above, but in this section
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.) and systems on graphs
82C21 Dynamic continuum models (systems of particles, etc.)
82C22 Interacting particle systems [See also 60K35]
82C23 Exactly solvable dynamic models [See also 37K60]
82C24 Interface problems; diffusion-limited aggregation
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, 91E40, 92B20]
82C35 Irreversible thermodynamics, including Onsager-Machlup theory
82C40 Kinetic theory of gases
82C41 Dynamics of random walks, random surfaces, lattice animals, etc. [See also 60G50]
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
82D37 Semiconductors
82D40 Magnetic materials
82D45 Ferroelectrics
82D50 Superfluids
82D55 Superconductors
82D60 Polymers
82D75 Nuclear reactor theory; neutron transport
82D77 Quantum wave guides, quantum wires [See also 78A50]

[MSC Source Date: Monday 21 December 2009 09:49]

82D80	Nanostructures and nanoparticles
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 work
83-06 Proceedings, conferences, collections, etc.
83-08 Computational methods
83Axx **Special relativity**
83A05 Special relativity
83A99 None of the above, but in this section
83Bxx **Observational and experimental questions**
83B05 Observational and experimental questions
83B99 None of the above, but in this section
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 Einstein-Maxwell equations
83C25 Approximation procedures, weak fields
83C27 Lattice gravity, Regge calculus and other discrete methods
83C30 Asymptotic procedures (radiation, news functions, H-spaces, etc.)
83C35 Gravitational waves
83C40 Gravitational energy and conservation laws; groups of motions
83C45 Quantization of the gravitational field
83C47 Methods of quantum field theory [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; Newman-Penrose formalism
83C65 Methods of noncommutative geometry [See also 58B34]
83C75 Space-time singularities, cosmic censorship, etc.
83C80 Analogues in lower dimensions
83C99 None of the above, but in this section
83Dxx **Relativistic gravitational theories other than Einstein's, including asymmetric field theories**
83D05 Relativistic gravitational theories other than Einstein's, including asymmetric field theories
83D99 None of the above, but in this section
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
83Fxx **Cosmology**
83F05 Cosmology
83F99 None of the above, but in this section

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 work
85-06 Proceedings, conferences, collections, etc.
85-08 Computational methods
85Axx **Astronomy and astrophysics {For celestial mechanics, see 70F15}**
85A04 General
85A05 Galactic and stellar dynamics
85A15 Galactic and stellar structure
85A20 Planetary atmospheres
85A25 Radiative transfer
85A30 Hydrodynamic and hydromagnetic problems [See also 76Y05]
85A35 Statistical astronomy

85A40 Cosmology {For relativistic cosmology, see 83F05}
85A99 Miscellaneous topics

86-XX **GEOPHYSICS [See also 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 work
86-06 Proceedings, conferences, collections, etc.
86-08 Computational methods
86Axx **Geophysics [See also 76U05, 76V05]**
86A04 General
86A05 Hydrology, hydrography, oceanography [See also 76Bxx, 76E20, 76Q05, 76Rxx, 76U05]
86A10 Meteorology and atmospheric physics [See also 76Bxx, 76E20, 76N15, 76Q05, 76Rxx, 76U05]
86A15 Seismology
86A17 Global dynamics, earthquake problems
86A20 Potentials, prospecting
86A22 Inverse problems [See also 35R30]
86A25 Geo-electricity and geomagnetism [See also 76W05, 78A25]
86A30 Geodesy, mapping problems
86A32 Geostatistics
86A40 Glaciology
86A60 Geological problems
86A99 Miscellaneous topics

90-XX **OPERATIONS RESEARCH, MATHEMATICAL PROGRAMMING**
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
90Bxx **Operations research and management science**
90B05 Inventory, storage, reservoirs
90B06 Transportation, logistics
90B10 Network models, deterministic
90B15 Network models, stochastic
90B18 Communication networks [See also 68M10, 94A05]
90B20 Traffic problems
90B22 Queues and service [See also 60K25, 68M20]
90B25 Reliability, availability, maintenance, inspection [See also 60K10, 62N05]
90B30 Production models
90B35 Scheduling theory, deterministic [See also 68M20]
90B36 Scheduling theory, stochastic [See also 68M20]
90B40 Search theory
90B50 Management decision making, including multiple objectives [See also 90C29, 90C31, 91A35, 91B06]
90B60 Marketing, advertising [See also 91B60]
90B70 Theory of organizations, manpower planning [See also 91D35]
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
90C22 Semidefinite programming
90C25 Convex programming
90C26 Nonconvex programming, global optimization
90C27 Combinatorial optimization
90C29 Multi-objective and goal programming
90C30 Nonlinear programming

90C31	Sensitivity, stability, parametric optimization
90C32	Fractional programming
90C33	Complementarity and equilibrium problems and variational inequalities (finite dimensions)
90C34	Semi-infinite programming
90C35	Programming involving graphs or networks [See also 90C27]
90C39	Dynamic programming [See also 49L20]
90C40	Markov and semi-Markov decision processes
90C46	Optimality conditions, duality [See also 49N15]
90C47	Minimax problems [See also 49K35]
90C48	Programming in abstract spaces
90C49	Extreme-point and pivoting methods
90C51	Interior-point methods
90C52	Methods of reduced gradient type
90C53	Methods of quasi-Newton type
90C55	Methods of successive quadratic programming type
90C56	Derivative-free methods and methods using generalized derivatives [See also 49J52]
90C57	Polyhedral combinatorics, branch-and-bound, branch-and-cut
90C59	Approximation methods and heuristics
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
91-XX	**GAME THEORY, ECONOMICS, SOCIAL AND BEHAVIORAL SCIENCES**
91-00	General reference works (handbooks, dictionaries, bibliographies, etc.)
91-01	Instructional exposition (textbooks, tutorial papers, etc.)
91-02	Research exposition (monographs, survey articles)
91-03	Historical (must also be assigned at least one classification number from section 01)
91-04	Explicit machine computation and programs (not the theory of computation or programming)
91-06	Proceedings, conferences, collections, etc.
91-08	Computational methods
91Axx	**Game theory**
91A05	2-person games
91A06	n-person games, $n > 2$
91A10	Noncooperative games
91A12	Cooperative games
91A13	Games with infinitely many players
91A15	Stochastic games
91A18	Games in extensive form
91A20	Multistage and repeated games
91A22	Evolutionary games
91A23	Differential games [See also 49N70]
91A24	Positional games (pursuit and evasion, etc.) [See also 49N75]
91A25	Dynamic games
91A26	Rationality, learning
91A28	Signaling, communication
91A30	Utility theory for games [See also 91B16]
91A35	Decision theory for games [See also 62Cxx, 91B06, 90B50]
91A40	Game-theoretic models
91A43	Games involving graphs [See also 05C57]
91A44	Games involving topology or set theory
91A46	Combinatorial games
91A50	Discrete-time games
91A55	Games of timing
91A60	Probabilistic games; gambling [See also 60G40]
91A65	Hierarchical games
91A70	Spaces of games
91A80	Applications of game theory
91A90	Experimental studies
91A99	None of the above, but in this section
91Bxx	**Mathematical economics {For econometrics, see 62P20}**
91B02	Fundamental topics (basic mathematics, methodology; applicable to economics in general)
91B06	Decision theory [See also 62Cxx, 90B50, 91A35]
91B08	Individual preferences
91B10	Group preferences
91B12	Voting theory
91B14	Social choice
91B15	Welfare economics
91B16	Utility theory
91B18	Public goods
91B24	Price theory and market structure
91B25	Asset pricing models
91B26	Market models (auctions, bargaining, bidding, selling, etc.)

91B30	Risk theory, insurance
91B32	Resource and cost allocation
91B38	Production theory, theory of the firm
91B40	Labor market, contracts
91B42	Consumer behavior, demand theory
91B44	Informational economics
91B50	General equilibrium theory
91B51	Dynamic stochastic general equilibrium theory
91B52	Special types of equilibria
91B54	Special types of economies
91B55	Economic dynamics
91B60	Trade models
91B62	Growth models
91B64	Macro-economic models (monetary models, models of taxation)
91B66	Multisectoral models
91B68	Matching models
91B69	Heterogeneous agent models
91B70	Stochastic models
91B72	Spatial models
91B74	Models of real-world systems
91B76	Environmental economics (natural resource models, harvesting, pollution, etc.)
91B80	Applications of statistical and quantum mechanics to economics (econophysics)
91B82	Statistical methods; economic indices and measures
91B84	Economic time series analysis [See also 62M10]
91B99	None of the above, but in this section
91Cxx	**Social and behavioral sciences: general topics {For statistics, see 62–XX}**
91C05	Measurement theory
91C15	One- and multidimensional scaling
91C20	Clustering [See also 62H30]
91C99	None of the above, but in this section
91Dxx	**Mathematical sociology (including anthropology)**
91D10	Models of societies, social and urban evolution
91D20	Mathematical geography and demography
91D25	Spatial models [See also 91B72]
91D30	Social networks
91D35	Manpower systems [See also 91B40, 90B70]
91D99	None of the above, but in this section
91Exx	**Mathematical psychology**
91E10	Cognitive psychology
91E30	Psychophysics and psychophysiology; perception
91E40	Memory and learning [See also 68T05]
91E45	Measurement and performance
91E99	None of the above, but in this section
91Fxx	**Other social and behavioral sciences (mathematical treatment)**
91F10	History, political science
91F20	Linguistics [See also 03B65, 68T50]
91F99	None of the above, but in this section
91Gxx	**Mathematical finance**
91G10	Portfolio theory
91G20	Derivative securities
91G30	Interest rates (stochastic models)
91G40	Credit risk
91G50	Corporate finance
91G60	Numerical methods (including Monte Carlo methods)
91G70	Statistical methods, econometrics
91G80	Financial applications of other theories (stochastic control, calculus of variations, PDE, SPDE, dynamical systems)
91G99	None of the above, but in this section
92-XX	**BIOLOGY AND OTHER NATURAL 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, cladistics, statistics
92B15	General biostatistics [See also 62P10]
92B20	Neural networks, artificial life and related topics [See also 68T05, 82C32, 94Cxx]
92B25	Biological rhythms and synchronization
92B99	None of the above, but in this section

[MSC Source Date: Monday 21 December 2009 09:49]

92Cxx	**Physiological, cellular and medical topics**
92C05	Biophysics
92C10	Biomechanics [See also 74L15]
92C15	Developmental biology, pattern formation
92C17	Cell movement (chemotaxis, etc.)
92C20	Neural biology
92C30	Physiology (general)
92C35	Physiological flow [See also 76Z05]
92C37	Cell biology
92C40	Biochemistry, molecular biology
92C42	Systems biology, networks
92C45	Kinetics in biochemical problems (pharmacokinetics, enzyme kinetics, etc.) [See also 80A30]
92C50	Medical applications (general)
92C55	Biomedical imaging and signal processing [See also 44A12, 65R10, 94A08, 94A12]
92C60	Medical epidemiology
92C80	Plant biology
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
92Fxx	**Other natural sciences (should also be assigned at least one other classification number in this section)**
92F05	Other natural sciences (should also be assigned at least one other classification number in section 92)
92F99	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
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
93B07	Observability
93B10	Canonical structure
93B11	System structure simplification
93B12	Variable structure systems
93B15	Realizations from input-output data
93B17	Transformations
93B18	Linearizations
93B20	Minimal systems representations
93B25	Algebraic methods
93B27	Geometric methods
93B28	Operator-theoretic methods [See also 47A48, 47A57, 47B35, 47N70]
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**
93C05	Linear systems
93C10	Nonlinear systems
93C15	Systems governed by ordinary differential equations [See also 34H05]
93C20	Systems governed by partial differential equations
93C23	Systems governed by functional-differential equations [See also 34K35]
93C25	Systems in abstract spaces
93C30	Systems governed by functional relations other than differential equations (such as hybrid and switching systems)
93C35	Multivariable systems
93C40	Adaptive control
93C41	Problems with incomplete information
93C42	Fuzzy control systems
93C55	Discrete-time systems
93C57	Sampled-data systems
93C62	Digital systems
93C65	Discrete event systems
93C70	Time-scale analysis and singular perturbations
93C73	Perturbations
93C80	Frequency-response methods
93C83	Control problems involving computers (process control, etc.)
93C85	Automated systems (robots, etc.) [See also 68T40, 70B15, 70Q05]
93C95	Applications
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 or robust stabilization
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
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
93E24	Least squares and related methods
93E25	Other computational methods
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, 90B18]
94A08	Image processing (compression, reconstruction, etc.) [See also 68U10]
94A11	Application of orthogonal and other special functions
94A12	Signal theory (characterization, reconstruction, filtering, etc.)
94A13	Detection theory
94A14	Modulation and demodulation
94A15	Information theory, general [See also 62B10, 81P45]
94A17	Measures of information, entropy
94A20	Sampling theory
94A24	Coding theorems (Shannon theory)
94A29	Source coding [See also 68P30]
94A34	Rate-distortion theory
94A40	Channel models (including quantum)
94A45	Prefix, length-variable, comma-free codes [See also 20M35, 68Q45]
94A50	Theory of questionnaires
94A55	Shift register sequences and sequences over finite alphabets
94A60	Cryptography [See also 11T71, 14G50, 68P25, 81P94]
94A62	Authentication and secret sharing [See also 81P94]
94A99	None of the above, but in this section

94Bxx	**Theory of error-correcting codes and error-detecting 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, 14G50]	
94B30	Majority codes	
94B35	Decoding	
94B40	Arithmetic codes [See also 11T71, 14G50]	
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, 11H71]	
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	
94Dxx	**Fuzzy sets and logic (in connection with questions of Section 94) [See also 03B52, 03E72, 28E10]**	
94D05	Fuzzy sets and logic (in connection with questions of Section 94) [See also 03B52, 03E72, 28E10]	
94D99	None of the above, but in this section	
97–XX	**MATHEMATICS EDUCATION**	
97–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	
97–01	Instructional exposition (textbooks, tutorial papers, etc.)	
97–02	Research exposition (monographs, survey articles)	
97–03	Historical (must also be assigned at least one classification number from Section 01)	
97–04	Explicit machine computation and programs (not the theory of computation or programming)	
97–06	Proceedings, conferences, collections, etc.	
97Axx	**General, mathematics and education**	
97A10	Comprehensive works, reference books	
97A20	Recreational mathematics, games [See also 00A08]	
97A30	History of mathematics and mathematics education [See also 01–XX]	
97A40	Mathematics and society	
97A50	Bibliographies [See also 01–00]	
97A70	Theses and postdoctoral theses	
97A80	Popularization of mathematics	
97A99	None of the above, but in this section	
97Bxx	**Educational policy and systems**	
97B10	Educational research and planning	
97B20	General education	
97B30	Vocational education	
97B40	Higher education	
97B50	Teacher education {For research aspects, see 97C70}	
97B60	Adult and further education	
97B70	Syllabuses, educational standards	
97B99	None of the above, but in this section	
97Cxx	**Psychology of mathematics education, research in mathematics education**	
97C10	Comprehensive works	
97C20	Affective behavior	
97C30	Cognitive processes, learning theories	
97C40	Intelligence and aptitudes	
97C50	Language and verbal communities	
97C60	Sociological aspects of learning	
97C70	Teaching-learning processes	
97C99	None of the above, but in this section	
97Dxx	**Education and instruction in mathematics**	
97D10	Comprehensive works, comparative studies	
97D20	Philosophical and theoretical contributions (maths didactics)	
97D30	Objectives and goals	
97D40	Teaching methods and classroom techniques	
97D50	Teaching problem solving and heuristic strategies {For research aspects, see 97Cxx}	
97D60	Student assessment, achievement control and rating	
97D70	Learning difficulties and student errors	
97D80	Teaching units and draft lessons	

97D99	None of the above, but in this section
97Exx	**Foundations of mathematics**
97E10	Comprehensive works
97E20	Philosophy and mathematics
97E30	Logic
97E40	Language of mathematics
97E50	Reasoning and proving in the mathematics classroom
97E60	Sets, relations, set theory
97E99	None of the above, but in this section
97Fxx	**Arithmetic, number theory**
97F10	Comprehensive works
97F20	Pre-numerical stage, concept of numbers
97F30	Natural numbers
97F40	Integers, rational numbers
97F50	Real numbers, complex numbers
97F60	Number theory
97F70	Measures and units
97F80	Ratio and proportion, percentages
97F90	Real life mathematics, practical arithmetic
97F99	None of the above, but in this section
97Gxx	**Geometry**
97G10	Comprehensive works
97G20	Informal geometry
97G30	Areas and volumes
97G40	Plane and solid geometry
97G50	Transformation geometry
97G60	Plane and spherical trigonometry
97G70	Analytic geometry. Vector algebra
97G80	Descriptive geometry
97G99	None of the above, but in this section
97Hxx	**Algebra**
97H10	Comprehensive works
97H20	Elementary algebra
97H30	Equations and inequalities
97H40	Groups, rings, fields
97H50	Ordered algebraic structures
97H60	Linear algebra
97H99	None of the above, but in this section
97Ixx	**Analysis**
97I10	Comprehensive works
97I20	Mappings and functions
97I30	Sequences and series
97I40	Differential calculus
97I50	Integral calculus
97I60	Functions of several variables
97I70	Functional equations
97I80	Complex analysis
97I99	None of the above, but in this section
97Kxx	**Combinatorics, graph theory, probability theory, statistics**
97K10	Comprehensive works
97K20	Combinatorics
97K30	Graph theory
97K40	Descriptive statistics
97K50	Probability theory
97K60	Distributions and stochastic processes
97K70	Foundations and methodology of statistics
97K80	Applied statistics
97K99	None of the above, but in this section
97Mxx	**Mathematical modeling, applications of mathematics**
97M10	Modeling and interdisciplinarity
97M20	Mathematics in vocational training and career education
97M30	Financial and insurance mathematics
97M40	Operations research, economics
97M50	Physics, astronomy, technology, engineering
97M60	Biology, chemistry, medicine
97M70	Behavioral and social sciences
97M80	Arts, music, language, architecture
97M99	None of the above, but in this section
97Nxx	**Numerical mathematics**
97N10	Comprehensive works
97N20	Rounding, estimation, theory of errors
97N30	Numerical algebra
97N40	Numerical analysis
97N50	Interpolation and approximation
97N60	Mathematical programming
97N70	Discrete mathematics
97N80	Mathematical software, computer programs
97N99	None of the above, but in this section

97Pxx	**Computer science**
97P10	Comprehensive works
97P20	Theory of computer science
97P30	System software
97P40	Programming languages
97P50	Programming techniques
97P60	Hardware
97P70	Computer science and society
97P99	None of the above, but in this section
97Qxx	**Computer science education**
97Q10	Comprehensive works
97Q20	Affective aspects in teaching computer science
97Q30	Cognitive processes
97Q40	Sociological aspects
97Q50	Objectives
97Q60	Teaching methods and classroom techniques
97Q70	Student assessment
97Q80	Teaching units
97Q99	None of the above, but in this section
97Rxx	**Computer science applications**
97R10	Comprehensive works, collections of programs
97R20	Applications in mathematics
97R30	Applications in sciences
97R40	Artificial intelligence
97R50	Data bases, information systems
97R60	Computer graphics
97R70	User programs, administrative applications
97R80	Recreational computing
97R99	None of the above, but in this section
97Uxx	**Educational material and media, educational technology**
97U10	Comprehensive works
97U20	Textbooks. Textbook research
97U30	Teachers' manuals and planning aids
97U40	Problem books. Competitions. Examinations
97U50	Computer assisted instruction; e-learning
97U60	Manipulative materials
97U70	Technological tools, calculators
97U80	Audiovisual media
97U99	None of the above, but in this section