

"Core" Subject Taxonomy for Mathematical Sciences Education 4/2/2002

1.0	Numbers and Computation
1.1	Number Concepts
1.1.1	Natural
1.1.2	Integers
1.1.3	Rational
1.1.4	Irrational
1.1.5	Algebraic
1.1.6	Real
1.1.7	Complex
1.1.8	Famous Numbers
1.1.8.1	0
1.1.8.2	pi
1.1.8.3	e
1.1.8.4	i
1.1.8.5	Golden Mean
1.2	Arithmetic
1.2.1	Operations
1.2.1.1	Addition
1.2.1.2	Subtraction
1.2.1.3	Multiplication
1.2.1.4	Division
1.2.1.5	Roots
1.2.1.6	Factorials
1.2.1.7	Factoring
1.2.1.8	Properties of Operations
1.2.1.9	Estimation
1.2.2	Fractions
1.2.2.1	Addition
1.2.2.2	Subtraction
1.2.2.3	Multiplication
1.2.2.4	Division
1.2.2.5	Ratio and Proportion
1.2.2.6	Equivalent Fractions
1.2.3	Decimals
1.2.3.1	Addition
1.2.3.2	Subtraction
1.2.3.3	Multiplication
1.2.3.4	Division
1.2.3.5	Percents
1.2.4	Comparison of numbers
1.2.5	Exponents
1.2.5.1	Multiplication
1.2.5.2	Division
1.2.5.3	Powers
1.2.5.4	Integer Exponents
1.2.5.5	Rational Exponents
1.3	Patterns and Sequences
1.3.1	Number Patterns
1.3.2	Fibonacci Sequence
1.3.3	Arithmetic Sequence
1.3.4	Geometric Sequence
1.4	Measurement
1.4.1	Units of Measurement

1.4.1.1	Metric System
1.4.1.2	Standard Units
1.4.1.3	Nonstandard Units
1.4.2	Linear Measure
1.4.2.1	Distance
1.4.2.2	Circumference
1.4.2.3	Perimeter
1.4.3	Area
1.4.3.1	Area of Polygons
1.4.3.2	Area of Circles
1.4.3.3	Surface Area
1.4.3.4	Nonstandard Shapes
1.4.4	Volume
1.4.5	Weight and Mass
1.4.6	Temperature
1.4.7	Time
1.4.8	Speed
1.4.9	Money
1.4.10	Scale
2.0	Logic and Foundations
2.1	Logic
2.1.1	Venn Diagrams
2.1.2	Propositional and Predicate Logic
2.1.3	Methods of Proof
2.2	Set Theory
2.2.1	Sets and Set Operations
2.2.2	Relations and Functions
2.2.3	Cardinality
2.2.4	Axiom of Choice
2.3	Computability and Decidability
2.4	Model Theory
3.0	Algebra and Number Theory
3.1	Algebra
3.1.1	Graphing Techniques
3.1.2	Algebraic Manipulation
3.1.3	Functions
3.1.3.1	Linear
3.1.3.2	Quadratic
3.1.3.3	Polynomial
3.1.3.4	Rational
3.1.3.5	Exponential
3.1.3.6	Logarithmic
3.1.3.7	Piece-wise
3.1.3.8	Step
3.1.4	Equations
3.1.4.1	Linear
3.1.4.2	Quadratic
3.1.4.3	Polynomial
3.1.4.4	Rational
3.1.4.5	Exponential
3.1.4.6	Logarithmic

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	3.1.4.7	Systems
	3.1.5	Inequalities
	3.1.6	Matrices
	3.1.7	Sequences and Series
	3.1.8	Algebraic Proof
3.2		Linear Algebra
	3.2.1	Systems of Linear Equations
	3.2.2	Matrix algebra
	3.2.3	Vectors in R^3
	3.2.4	Vector Spaces
	3.2.5	Linear Transformations
	3.2.6	Eigenvalues and Eigenvectors
	3.2.7	Inner Product Spaces
3.3		Abstract Algebra
	3.3.1	Groups
	3.3.2	Rings and Ideals
	3.3.3	Fields
	3.3.4	Galois Theory
	3.3.5	Multilinear Algebra
3.4		Number Theory
	3.4.1	Integers
	3.4.2	Primes
	3.4.2.1	Divisibility
	3.4.2.2	Factorization
	3.4.2.3	Distributions of Primes
	3.4.3	Congruences
	3.4.4	Diophantine Equations
	3.4.5	Irrational Numbers
	3.4.6	Famous Problems
	3.4.7	Coding Theory
	3.4.8	Cryptography
	3.5	Category Theory
	3.6	K-Theory
	3.7	Homological Algebra
	3.8	Modular Arithmetic
4.0		Discrete Mathematics
	4.1	Cellular Automata
	4.2	Combinatorics
	4.2.1	Combinations
	4.2.2	Permutations
	4.3	Game Theory
	4.4	Algorithms
	4.5	Recursion
	4.6	Graph Theory
	4.7	Linear Programming
	4.8	Order and Lattices
	4.9	Theory of Computation
	4.10	Chaos
5.0		Geometry and Topology
	5.1	Geometric Proof
	5.2	Plane Geometry
	5.2.1	Measurement
	5.2.2	Lines and Planes
	5.2.3	Angles
	5.2.4	Triangles
	5.2.4.1	Properties

	5.2.4.2	Congruence
	5.2.4.3	Similarity
	5.2.4.4	Pythagorean Theorem
	5.2.5	Polygons
	5.2.5.1	Properties
	5.2.5.2	Regular
	5.2.5.3	Irregular
	5.2.5.4	Congruence
	5.2.5.5	Similarity
	5.2.6	Circles
	5.2.7	Patterns
	5.2.7.1	Geometric Patterns
	5.2.7.2	Tilings and Tessellations
	5.2.7.3	Symmetry
	5.2.7.4	Golden Ratio
	5.2.8	Transformations
	5.2.8.1	Translation
	5.2.8.2	Rotation
	5.2.8.3	Reflection
	5.2.8.4	Scaling
5.3		Solid Geometry
	5.3.1	Dihedral Angles
	5.3.2	Spheres
	5.3.3	Cones
	5.3.4	Cylinders
	5.3.5	Pyramids
	5.3.6	Prisms
	5.3.7	Polyhedra
5.4		Analytic Geometry
	5.4.1	Cartesian Coordinates
	5.4.2	Lines
	5.4.3	Circles
	5.4.4	Planes
	5.4.5	Conics
	5.4.6	Polar Coordinates
	5.4.7	Parametric Curves
	5.4.8	Surfaces
	5.4.9	Distance Formula
5.5		Projective Geometry
5.6		Differential Geometry
5.7		Algebraic Geometry
5.8		Topology
	5.8.1	Point Set Topology
	5.8.2	General Topology
	5.8.3	Differential Topology
	5.8.4	Algebraic Topology
5.9		Trigonometry
	5.9.1	Angles
	5.9.2	Trigonometric Functions
	5.9.3	Inverse Trigonometric Functions
	5.9.4	Trigonometric Identities
	5.9.5	Trigonometric Equations

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	5.9.6	Roots of Unity
	5.9.7	Spherical Trigonometry
	5.10	Fractal Geometry
6.0	Calculus	
	6.1	Single Variable
	6.1.1	Functions
	6.1.2	Limits
	6.1.3	Continuity
	6.1.4	Differentiation
	6.1.5	Integration
	6.1.6	Series
	6.2	Several Variables
	6.2.1	Functions of Several Variables
	6.2.2	Limits
	6.2.3	Continuity
	6.2.4	Partial Derivatives
	6.2.5	Multiple integrals
	6.2.6	Taylor Series
	6.3	Advanced Calculus
	6.3.1	Vector Valued Functions
	6.3.2	Line Integrals
	6.3.3	Surface Integrals
	6.3.4	Stokes Theorem
	6.3.5	Curvilinear Coordinates
	6.3.6	Linear spaces
	6.3.7	Fourier Series
	6.3.8	Orthogonal Functions
	6.4	Tensor Calculus
	6.5	Calculus of Variations
	6.6	Operational Calculus
7.0	Analysis	
	7.1	Real Analysis
	7.1.1	Metric Spaces
	7.1.2	Convergence
	7.1.3	Continuity
	7.1.4	Differentiation
	7.1.5	Integration
	7.1.6	Measure Theory
	7.2	Complex Analysis
	7.2.1	Convergence
	7.2.2	Infinite Series
	7.2.3	Analytic Functions
	7.2.4	Integration
	7.2.5	Contour Integrals
	7.2.6	Conformal Mappings
	7.2.7	Several Complex Variables
	7.3	Numerical Analysis
	7.3.1	Computer Arithmetic
	7.3.2	Solutions of Equations
	7.3.3	Solutions of Systems
	7.3.4	Interpolation
	7.3.5	Numerical Differentiation
	7.3.6	Numerical Integration

	7.3.7	Numerical Solutions of ODEs
	7.3.8	Numerical Solutions of PDEs
7.4	Integral Transforms	
	7.4.1	Fourier Transforms
	7.4.2	Laplace Transforms
	7.4.3	Hankel Transforms
	7.4.4	Wavelets
	7.4.5	Other Transforms
7.5	Signal Analysis	
	7.5.1	Sampling Theory
	7.5.2	Filters
	7.5.3	Noise
	7.5.4	Data Compression
	7.5.5	Image Processing
7.6	Functional Analysis	
	7.6.1	Hilbert Spaces
	7.6.2	Banach Spaces
	7.6.3	Topological Spaces
	7.6.4	Locally Convex Spaces
	7.6.5	Bounded Operators
	7.6.6	Spectral Theorem
	7.6.7	Unbounded Operators
7.7	Harmonic Analysis	
7.8	Global Analysis	
8.0	Differential and Difference Equations	
	8.1	Ordinary Differential Equations
	8.1.1	First Order
	8.1.2	Second Order
	8.1.3	Linear Oscillations
	8.1.4	Nonlinear Oscillations
	8.1.5	Systems of Differential Equations
	8.1.6	Sturm Liouville Problems
	8.1.7	Special Functions
	8.1.8	Power Series Methods
	8.1.9	Laplace Transforms
	8.2	Partial Differential Equations
	8.2.1	First Order
	8.2.2	Elliptic
	8.2.3	Parabolic
	8.2.4	Hyperbolic
	8.2.5	Integral Transforms
	8.2.6	Integral Equations
	8.2.7	Potential Theory
	8.2.8	Nonlinear Equations
	8.2.9	Symmetries and Integrability
	8.3	Difference Equations
	8.3.1	First Order
	8.3.2	Second Order
	8.3.3	Linear Systems
	8.3.4	Z Transforms
	8.3.5	Orthogonal Polynomials
	8.4	Dynamical Systems
	8.4.1	1D Maps

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8.4.2	2D Maps
8.4.3	Lyapunov Exponents
8.4.4	Bifurcations
8.4.5	Fractals
8.4.6	Differentiable Dynamics
8.4.7	Conservative Dynamics
8.4.8	Chaos
8.4.9	Complex Dynamical Systems
9.0	Statistics and Probability
9.1	Data
9.1.1	Data Collection
9.1.1.1	Experimental Design
9.1.1.2	Sampling
9.1.1.3	Survey
9.1.2	Data Representation
9.1.2.1	Graphs
9.1.2.2	BoxPlots
9.1.2.3	StemPlots
9.1.2.4	Tables
9.2	Statistics
9.2.1	Elementary Statistics
9.2.1.1	Mean
9.2.1.2	Median
9.2.1.3	Mode
9.2.1.4	Standard Deviation
9.2.1.5	Correlation
9.2.1.6	Distribution
9.2.2	Sampling
9.2.3	Linear Regression
9.2.4	Nonlinear Regression
9.2.5	Queuing Theory
9.2.6	Bayesian Statistics
9.2.7	Confidence Testing
9.3	Probability
9.3.1	Elementary Probability
9.3.1.1	Sample Space
9.3.1.2	Events
9.3.1.3	Independence
9.3.1.4	Combinations and Permutations
9.3.2	Random Variables
9.3.2.1	Discrete Distributions
9.3.2.2	Continuous Distributions
9.3.2.3	Expected Value
9.3.2.4	Variance
9.3.3	Limit Theorems
9.3.3.1	Central Limit Theorem
9.3.3.2	Laws of Large Numbers

9.3.4	Brownian Motion
9.3.5	Markov Chains
9.3.6	Probability Measures
9.3.7	Stochastic Processes
10.0	Applied Mathematics
10.1	Mathematical Physics
10.2	Mathematical Economics
10.3	Mathematical Biology
10.4	Mathematics for Business
10.5	Engineering Mathematics
10.6	Mathematical Sociology
10.7	Mathematics for Social Sciences
10.8	Mathematics for Computer Science
10.9	Mathematics for Humanities
10.10	Consumer Mathematics
11.0	Mathematics History
11.1	General
11.2	Famous Problems
11.3	Biographies of Mathematicians