Discrete Mathematics – Crosswalk (Summary of Revisions): 2016 *Mathematics Standards of Learning and Curriculum Framework*

Additions (2016 SOL)	Deletions from Discrete Mathematics (2009 SOL)
• Use and interpret Venn diagrams representing set relationships [Moved from G.1]	• None
Parameter Changes/Clarifications (2016 SOL)	**Moves within Discrete Mathematics (2009 SOL to 2016 SOL)**
• Most of the revisions to the standards and curriculum framework for Discrete Mathematics focused on simplifying the language of the standards.	• DM.5 – [Moved to DM.10] • DM.6 – [Moved to DM.11] • DM.7 – [Moved to DM.5] • DM.8 – [Moved to DM.6] • DM.9 – [Moved to DM.7] • DM.10 – [Moved to DM.12] • DM.11 – [Moved to DM.8] • DM.12 – [Moved to DM.9]

EKS = Essential Knowledge and Skills, referring to the column on the far right of the Curriculum Framework
EU = Essential Understandings, referring to the column on the far left of the Curriculum Framework

Comparison of Mathematics Standards of Learning – 2009 to 2016

2009 SOL		2016 SOL † indicates that the standard should be included in the local curriculum for a semester course
		Graphs
*DM.1	The student will model problems, using vertex-edge graphs. The concepts of valence, connectedness, paths, planarity, and directed graphs will be investigated. Adjacency matrices and matrix operations will be used to solve problems (e.g., food chains, number of paths).	†DM.1 The student will model problems, using vertex-edge graphs. The concepts of valence, connectedness, paths, planarity, and directed graphs will be investigated.
*DM.2	The student will solve problems through investigation and application of circuits, cycles, Euler Paths, Euler Circuits, Hamilton Paths, and Hamilton Circuits. Optimal solutions will be sought using existing algorithms and student-created algorithms.	†DM.2 The student will solve problems through investigation and application of circuits, cycles, Euler paths, Euler circuits, Hamilton paths, and Hamilton circuits. Optimal solutions will be sought using existing algorithms and student-created algorithms.
*DM.3	The student will apply graphs to conflict-resolution problems, such as map coloring, scheduling, matching, and optimization. Graph coloring and chromatic number will be used.	†DM.3 The student will apply graphs to conflict-resolution problems, such as map coloring, scheduling, matching, and optimization.
*DM.4	The student will apply algorithms, such as Kruskal's, Prim's, or Dijkstra's, relating to trees, networks, and paths. Appropriate technology will be used to determine the number of possible solutions and generate solutions when a feasible number exists.	DM.4 The student will apply algorithms relating to trees, networks, and paths. Appropriate technology will be used to determine the number of possible solutions and generate solutions when a feasible number exists.
		Election Theory and Fair Division
		†DM.5 The student will analyze and describe the issue of fair division in discrete and continuous cases. [Moved from DM.7]
		†DM.6 The student will investigate and describe weighted voting and the results of various election methods. These may include approval and preference voting as well as plurality, majority, runoff, sequential runoff, Borda count, and Condorcet winners. [Moved from DM.8]
		DM.7 The student will identify apportionment inconsistencies that apply to issues such as salary caps in sports and allocation of representatives to Congress. Historical and current methods will be compared. [Moved from DM.9]
		Computer Mathematics
		DM.8 The student will describe and apply sorting algorithms and coding algorithms used in sorting, processing, and communicating information. [Moved from

2009 SOL	2016 SOL † indicates that the standard should be included in the local curriculum for a semester course
	DM.11]
	†DM.9 The student will select, justify, and apply an appropriate technique to solve a logic problem. [Moved from DM.12]
*DM.5 The student will use algorithms to schedule tasks in order to determine a minimum project time. The algorithms will include critical path analysis, the list-processing algorithm, and student-created algorithms.	**Recursion and Optimization** DM.10 The student will use algorithms to schedule tasks in order to determine a minimum project time. The algorithms will include critical path analysis, the list-processing algorithm, and student-created algorithms.
*DM.6 The student will solve linear programming problems. Appropriate technology will be used to facilitate the use of matrices, graphing techniques, and the Simplex method of determining solutions.	DM.11 The student will solve linear programming problems.
DM.7 The student will analyze and describe the issue of fair division (e.g., cake cutting, estate division). Algorithms for continuous and discrete cases will be applied. [Moved to DM.5]	
DM.8 The student will investigate and describe weighted voting and the results of various election methods. These may include approval and preference voting as well as plurality, majority, run-off, sequential run-off, Borda count, and Condorcet winners. [Moved to DM.6]	
DM.9 The student will identify apportionment inconsistencies that apply to issues such as salary caps in sports and allocation of representatives to Congress. Historical and current methods will be compared. [Moved to DM.7]	
DM.10 The student will use the recursive process and difference equations with the aid of appropriate technology to generate a) compound interest; b) sequences and series; c) fractals; d) population growth models; and e) the Fibonacci sequence.	DM.12 The student will use the recursive process and difference equations with the aid of appropriate technology to generate a) compound interest; b) sequences and series; c) fractals; d) population growth models; and e) the Fibonacci sequence.
DM.11 The student will describe and apply sorting algorithms and coding algorithms used in sorting, processing, and communicating information. [Moved to DM.8] These will include a) bubble sort, merge sort, and network sort; and b) ISBN, UPC, zip, and banking codes. [Bullets included in DM.8 EKS]	

2009 SOL	2016 SOL † indicates that the standard should be included in the local curriculum for a semester course
DM.12 The student will select, justify, and apply an appropriate technique to solve a logic problem. [Moved to DM.9] Techniques will include Venn diagrams, truth tables, and matrices. [Included in DM.9 EKS]	
DM.13 The student will apply the formulas of combinatorics in the areas of a) the Fundamental (Basic) Counting Principle; b) knapsack and bin-packing problems; c) permutations and combinations; and d) the pigeonhole principle.	DM.13 The student will apply the formulas of combinatorics in the areas of a) the Fundamental (Basic) Counting Principle; b) knapsack and bin-packing problems; c) permutations and combinations; and d) the pigeonhole principle.