Republic of the Philippines

Department of Education

DepEd Complex, Meralco Avenue, Pasig City

STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM

FINITE MATHEMATICS 1

Grade 11/12

Course Description:

Finite Mathematics focuses on developing learners' understanding and appreciation of mathematical concepts and their practical applications in various fields, including business, economics, and the social sciences. It emphasizes problem-solving as well as analytical and critical thinking. Learners will enhance their reasoning and decision-making skills by applying mathematical methods to real-world problems, interpreting data, and formulating solutions. Additionally, they will develop proficiency in using mathematical tools and techniques, preparing them for further studies and diverse career pathways that do not require higher-level mathematics.

Finite Mathematics 1 explores topics such as geometric designs, patterns in nature and art, matrices, and linear programming. Learners will apply mathematical methods to model and solve practical problems, interpret data, and explore the structural beauty of mathematics in both natural and human-designed contexts. Learners develop proficiency in using mathematical tools and techniques by integrating visual and analytical reasoning.

Note: (Finite Mathematics 1 and Finite Mathematics 2 have independent content, where Finite Mathematics 1 is not a prerequisite for Finite Mathematics 2).

Elective: Academic
Prerequisite: None
Time Allotment: 80 hours for one semester, 4 hours per week

QUARTER 1

CONTENT DOMAIN	**CONTENT STANDARDS** *The learners demonstrate knowledge and understanding of*	**LEARNING COMPETENCIES** *The learners …*
GEOMETRY OF DESIGN	1. Symmetries in nature and art 2. Different linear transformations (geometric approach) 3. Tiling and Tessellations 4. Frieze Patterns	1. identify and describe symmetries in nature and art a. reflection b. rotational c. line of symmetry d. center of rotation e. angle of rotation 2. illustrate various geometric transformations (translation, reflection, rotation, dilation, and glide reflection); 3. identify polygons that can tesselate the plane; 4. generate tessellations using geometric transformations; 5. construct Escher-type tessellations; 6. identify the geometric transformations that generate a given Frieze pattern;
PATTERNS IN NATURE AND ART	5. the Golden Ratio in nature and art 6. Fibonacci Sequence in nature and art 7. Fractals	7. define and explain the golden ratio, golden rectangle, golden spiral, and golden angles; 8. identify the golden ratio, golden rectangle, golden spiral, and golden angles in nature and art; 9. define the Fibonacci sequence and investigate its historical origin; 10. identify examples of Fibonacci sequence in nature and art; 11. explain the connection between the Golden Ratio and the Fibonacci sequence; 12. define and identify fractals in nature and art; and 13. generate fractals with or without the use of technology.
Performance Standards *By the end of the quarter, the learners are able to* contribute to a class exhibit of artworks inspired by geometric symmetries, tessellations, Frieze patterns, the golden ratio, the Fibonacci sequence, or fractals. Each artwork should be accompanied by a description detailing the mathematics involved.		

QUARTER 2

CONTENT DOMAIN	**CONTENT STANDARDS** *The learners demonstrate knowledge and understanding of*	**LEARNING COMPETENCIES** *The learners …*
MATRICES	1. Fundamental concepts of matrices and basic operations	1. illustrate matrix and its components (e.g., row, column, dimensions, and order of a matrix); 2. perform matrix operations (addition, subtraction, scalar multiplication, multiplication, transposition); 3. apply properties of matrix operations (commutative, associative, distributive, zero matrix, identity matrix, etc.);
	2. Elementary row operations	4. represent systems of linear equations using matrices; 5. apply row operations to solve a system of linear equations; 6. define the inverse of a matrix; 7. calculate the inverse of a matrix using row operations; 8. use row operations to determine if a system of linear equations is independent (unique solution), dependent consistent (infinitely many solutions), or inconsistent (no solution);
	3. Determinants and their properties	9. compute the determinant of a 2×2 and a 3×3 matrix; 10. use the determinant to test matrix invertibility; 11. use Cramer's rule to solve an independent system of linear equations (2×2 and 3×3);
LINEAR PROGRAMMING	4. Fundamental concepts of linear programming	12. illustrate linear programming and its significance in decision-making; 13. formulate real-world problems into linear programming models;
	5. Graphical method	14. graph the feasible region in a Linear Programming Problem;. 15. determine the optimal solutions to a Linear Programming Problem using the Corner Point Theorem; 16. solve linear programming problems of two variables by graphical method, with or without technology;
	6. Simplex Method	17. construct an initial simplex tableau from an LP problem; and

		18. perform simplex iterations to obtain an optimal solution to an LP problem.
Performance Standards *By the end of the quarter, the learners are able to* model real-world situations using matrices and matrix operations. They are also able to formulate linear programming models and solve them using either the graphical or simplex method.		