



Republic of the Philippines

# Department of Education

DepEd Complex, Meralco Avenue, Pasig City

**STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM**

## **FINITE MATHEMATICS 2**

**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 2 emphasizes applications of counting techniques, probability, number theory, modular arithmetic, and networks and graphs in practical contexts such as decision-making, resource optimization, and communication systems. Learners will explore the structure and patterns of mathematical systems, use logic to analyze relationships and events, and apply combinatorial reasoning to real-world scenarios. Learners continue strengthening their quantitative literacy and data interpretation skills through these topics.

*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

<b>CONTENT DOMAIN</b>	<b>CONTENT STANDARDS</b> <i>The learners demonstrate knowledge and understanding of</i>	<b>LEARNING COMPETENCIES</b> <i>The learners ...</i>
COUNTING TECHNIQUES	1. Fundamental Principles of Counting	1. use the addition and multiplication principles to count elements of a set;
	2. Combination and permutation	2. differentiate between a combination and a permutation of objects; 3. calculate the number of combinations and permutations of n objects taken k at a time; 4. apply the properties of combinations to count the elements of a set; 5. solve problems involving combinations and permutations;
	3. Variations in Counting	6. compute the number of ways of arranging a. a set with non-distinct elements b. a set of objects in a circle 7. compute the number of ways of distributing objects (distinct and non-distinct) into groups; 8. solve counting problems using combinatorial techniques;
PROBABILITY	4. Probability of an event	9. illustrate sample spaces and events by listing elements; 10. calculate the probability of an event by (a) listing and (b) using counting techniques;
	5. Addition of probabilities	11. determine if two or more events are mutually exclusive; 12. calculate the probability of the complement of an event and the union of two events;
	6. Conditional probability and independent events	13. differentiate between simple and conditional probability; 14. calculate conditional probabilities; 15. determine if two events are independent; and 16. solve probability problems using the laws of probability and Bayes' Rule.
<p><b>Performance Standards</b>  <i>By the end of the quarter, the learners are able to apply combinations and permutations in counting the number of ways to select and arrange objects. In addition, they are able to solve problems involving probabilities.</i></p>		

## QUARTER 2

<b>CONTENT DOMAIN</b>	<b>CONTENT STANDARDS</b> <i>The learners demonstrate knowledge and understanding of</i>	<b>LEARNING COMPETENCIES</b> <i>The learners ...</i>
NUMBER THEORY	1. Divisibility	1. prove properties of divisibility of integers; 2. illustrate prime and composite integers and the fundamental theorem of Arithmetic by formulating the prime factorization of positive integers;
	2. Greatest common divisor and least common multiple	3. compute the GCD and LCM of two positive integers by prime factorization and the Euclidean algorithm; 4. solve linear Diophantine Equation using the Euclidean Algorithm;
	3. Modular Arithmetic	5. illustrate congruence modulo $m$ and its properties 6. perform arithmetic operations and solve linear equations modulo $m$ ; 7. solve problems involving modular arithmetic (UPC codes, ISBN, Luhn's algorithm for credit card number verification);
NETWORKS AND GRAPHS	4. Fundamental concepts of graph theory	8. illustrate elements of a graph (vertices/nodes, edges/arcs) and the different types of graphs (simple, directed, complete, bipartite, connected, path, cycle, tree, regular, etc.); 9. explore some real-life situations where graphs are utilized;
	5. Graph connectivity and transversability	10. differentiate between Eulerian and Hamiltonian paths/circuits; 11. apply Euler's theorem to determine the existence of Eulerian paths and circuits; 12. apply Dirac's condition for the existence of Hamiltonian circuits; 13. identify Eulerian and Hamiltonian circuits and paths in a connected graph;
	6. Spanning Trees and Shortest Paths	14. explain spanning trees and their significance; 15. apply Breadth-First Search (BFS) and Depth-First Search (DFS) algorithms to find spanning trees in a connected graph; and 16. apply different methods to find shortest paths (Dijkstra's algorithm, Floyd-Warshall algorithm).
<p><b>Performance Standards</b>  <i>By the end of the quarter, the learners are able to perform number-theoretic operations (GCD, LCM, modular arithmetic) and solve problems involving applications of modular arithmetic and linear Diophantine equations. In addition, they are able to solve problems involving graph theory algorithms (Eulerian and Hamiltonian paths and circuits, spanning trees, shortest paths), and discuss the applications of graphs in transportation, communication, network design, productivity, etc., through a presentation or written work.</i></p>		