



Davao del Sur State College
Brgy. Matti, Digos City, Davao del Sur

Principles and Strategies in Teaching Mathematics

Mary Lisley Jane R. Layson, MAEd

Elvie Jane R. Amion, MAEd



PREFACE

Welcome to Principles and Strategies in Teaching Mathematics, a course designed to equip pre-service and practicing mathematics teachers with pedagogical knowledge, instructional skills, and reflective practices necessary to facilitate meaningful and effective mathematics learning. As mathematics education continues to evolve in response to technological advancements, educational research, and the diverse needs of learners, teachers are expected to employ innovative, evidence-based, and learner-centered approaches that promote critical thinking, problem-solving, collaboration, and lifelong learning.

This coursepack presents a comprehensive exploration of the fundamental principles and contemporary strategies that guide effective mathematics instruction. It examines current trends and research in mathematics education, the principles of constructivism, cooperative learning, inquiry-based and research-based teaching, direct and indirect instruction, reflective teaching, flipped classroom pedagogy, and the development of effective learning plans. The coursepack also discusses instructional frameworks such as Edgar Dale's Cone of Experience, the National Council of Teachers of Mathematics (NCTM) Guiding Principles, and the Philippine K–12 Mathematics Curriculum, providing a strong theoretical and practical foundation for designing engaging, inclusive, and outcomes-based mathematics lessons.

Throughout this course, emphasis is placed on the teacher's role as a facilitator of learning who creates classroom environments that encourage active participation, meaningful discourse, collaboration, creativity, and reflective practice. Each lesson in this coursepack integrates current educational theories with practical classroom applications to help future mathematics teachers make informed instructional decisions that respond to the diverse needs, interests, and abilities of learners. Learners are likewise encouraged to critically evaluate instructional practices, utilize educational technologies effectively, and continuously reflect on their professional growth to improve teaching effectiveness.

This coursepack has been developed to serve as a valuable learning resource for students enrolled in Principles and Strategies in Teaching Mathematics. It is intended to support the development of competent, innovative, and reflective mathematics educators who are committed to excellence in teaching and lifelong professional learning. It is hoped that the knowledge, skills, and experiences gained from this course will inspire future teachers to cultivate mathematical understanding, curiosity, and confidence among their learners while contributing to the continuous improvement of mathematics education.



TABLE OF CONTENTS

Title Page	i
Preface	ii
Table of Contents	iii
Module 1: Foundations and Frameworks of Contemporary Mathematics Education	1
Lesson 1: Today's Students, Mathematics, and Society's Need	2
Lesson 2: Conceptual Framework of Math Education	6
Module Assessment	
Module Summary	11
List of References	12
Module 2: Learner-Centered Approaches and Strategies in Mathematics Instruction	13
Lesson 1: Constructivism in Teaching Mathematics	14
Lesson 2: Cooperative Learning Structures in Mathematics	18
Module Assessment	22
Module Summary	63
List of References	24
Module 3: Instructional Methods and Reflective Practices in Mathematics Teaching	25
Lesson 1: Research-based and Inquiry-based Teaching	26
Lesson 2: Direct and Indirect Instructions	31
Lesson 3: Punctuated and Interactive Lectures	34
Lesson 4: Reflective Teaching and its Significance	38
Module Assessment	42
Module Summary	44
List of References	45
Module 4: Innovative Lesson Design: Flipped Classrooms	46
Lesson 1: Flipped Classroom	47
Lesson 2: Lesson Planning and the Types of Lesson Plan	51
Module Assessment	59
Module Summary	60
List of References	61
Appendices	
Grammarians Certificate	
Course Outline	
Course Syllabus	

