LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
4. Distinguish between the universal quantifier and the existential quantifier, and determine truth values of quantified statements.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
5. Distinguish between sets and elements. Establish and use the notation of set theory.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
6. Define and apply principles of sets, subsets, and set equality.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
7. Define and use the basic algebraic properties of sets (including indexed families of sets) and use this knowledge to obtain more properties.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
8. Determine the validity of an argument, including providing counterexamples for false statements.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
9. Define the Cartesian Product of two sets.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
10. Define basic properties of a relation (and the including relations from one set to another as a subset of a Cartesian Product.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
11. Define a function as a relation; determine the image and pre-image of functions; determine the bas		

10.   Intro to Relations and their Properties; Equivalence Relations
11.   Properties of Equivalence Relations; Congruence Modulo n
12.   Intro to Functions; One-to-One Functions, Onto Functions
13.   Intro to Functions; One-to-One Functions, Onto Functions
14.   Application of Proofs to Properties of the Integers
15.   Applications of Proofs to Cardinality of Sets

LEARNING MATERIALS:

Chartrand, Polimeni, Zhang. *Mathematical Proofs: A Transition to Advanced Mathematics*. Pearson Publishing. ISBN: 13 978-0 321-39053-0.lication of Pe8048 Tc[0.)]TJEuavv