

## Discrete Mathematics Learning Objectives<sup>1</sup>

Upon completing this course, a student will be able to do the following:

1. Determine the meaning and truth values of propositional and predicate statements.
2. Determine if a given set is countable or uncountable, and for a countable set determine its cardinality.
3. Prove that relations (such as, equality, disjoint, subset) hold between two given sets.
4. Write logically correct direct proofs, proofs using contraposition, proofs by contradiction, proofs by cases, and proofs by induction.
5. Determine the domain, codomain, and range of a given function, and determine if it is an injection, surjection, or bijection.
6. Use concepts from elementary number theory to answer questions related to divisibility.
7. Use concepts from elementary combinatorics to answer counting problems.
8. Determine and prove if a given relation is an equivalence relation and determine the equivalence classes of a given equivalence relation.

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<sup>1</sup>This list was approved by the department on 04/18/2019