A. Course Description

Credits: 4

Prerequisites:
- MATH 115 College Algebra
- MATH 120 Precalculus
- MATH 210 Calculus I
- MATH 211 Calculus II
- MATH 310 Calculus III: Multivariable Calculus

Corequisites: None

Lecture Hours/Week:

MnTC Goals: Goal 04 - Mathematical/Logical Reasoning

This course covers a variety of important topics in math and computer science. Topics include: logic and proof, sets and functions, induction and recursion, elementary number theory, counting and probability, and basic theory of directed graphs.

B. Course Effective Dates: 09/06/1999 - 05/04/2010 05/04/2010 - 08/15/2017 08/16/2017 - Present

C. Outline of Major Content Areas:

See Course Description for major content areas.

D. Learning Outcomes (General)

1. Understand fundamental combinatorics principles including permutations and combinations and apply them to discrete probability problems.
2. Understand recursive algorithms and their applications.
3. Understand symbolic logic and predicate calculus. Master methods of proof including direct proof, proof by contradiction and mathematical induction.
4. Understand the fundamentals of elementary number theory including the Euclidean algorithm and number systems.
5. Understand the notion of an algorithm.
6. Understand functions, relations and directed graphs.

E. Learning Outcomes (MN Transfer Curriculum)
Goal 04 - Mathematical/Logical Reasoning

1. Apply higher-order problem-solving and/or modeling strategies.
2. Clearly express mathematical/logical ideas in writing.
3. Illustrate historical and contemporary applications of mathematical/logical systems.
4. Explain what constitutes a valid mathematical/logical argument (proof).

G. Special Information

Note: Students whose prerequisites are not identified by the system would contact the Math and Statistics department for an override at MATH@metrostate.edu. First day attendance required except by instructor permission.