

Minnesota State University Moorhead

MATH 311: Introduction to Proof and Abstract Mathematics

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 5

Lab Hours/Week: 0

OJT Hours/Week: *.*

Prerequisites:

This course requires the following prerequisite

MATH 262 - Calculus II

Corequisites: None

MnTC Goals: None

Logic, rules of inference, methods of proof including direct and indirect methods, sets, functions, and mathematical relations and properties of relations. Calculus II must be taken prior to or with Math 311.

B. COURSE EFFECTIVE DATES: 09/02/2017 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Sets and set operations
2. Equivalence relations
3. Partial orderings
4. Proof methods and strategies
5. Functions
6. Relations and the properties of relations
7. Representations of relations
8. Rules of inference and an introduction to proofs

D. LEARNING OUTCOMES (General)

1. Understand and use rules of inference to prove statements.
2. Work with sets, and understand how sets form a basis for relations and functions.
3. Prove a variety of results using both direct and indirect proof methods.
4. Prove results using Mathematical Induction.
5. Understand basic notions of relations, equivalence relations, partial orderings, and partitions.
6. Understand the axiomatic nature of mathematics.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted