Minnesota State University Moorhead

MATH 411: Introduction to Combinatorics

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: *.*

Prerequisites:
This course requires both of these prerequisites
MATH 262 - Calculus II
MATH 311 - Introduction to Proof and Abstract Mathematics

Corequisites: None

MnTC Goals: None

Permutations, Binomial Coefficients, Algebraic and Combinatorial Proof Techniques, Multinomial Coefficients, The Pigeonhole Principle, The Principle of Inclusion and Exclusion, Ordinary Generating Functions, Exponential Generating Functions, Integer Partitions, Set Partitions, Stirling Numbers of the First and Second Kind, and Bell Numbers.

B. COURSE EFFECTIVE DATES: 11/14/2011 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Combinatorial Proof Techniques.
2. Using the following to enumerate sets: a) Permutations and Binomial Coefficients, b) Pigeonhole Principle, c) The Principle of Inclusion and Exclusion, d) Ordinary and Exponential Coefficients.
3. Identities involving Binomial Coefficients.
4. Integer Partitions & Stirling Numbers of the First Kind.
5. Set Partitions, Stirling Numbers of the Second Kind, and Bell Numbers.

D. LEARNING OUTCOMES (General)

1. Students will be able to form combinatorial proofs.
2. Students will be able to think critically and mathematically.
3. Students will be able to generalize mathematical concepts.
4. Students will be able to analyze proofs and find mistakes.

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

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted