

**NVCC COLLEGE-WIDE COURSE CONTENT SUMMARY**  
**MTH 182 - FINITE MATHEMATICS II (3 CR.)**

**Course Description**

Introduces logic, counting techniques, probability and statistics, and mathematics of finance. Lecture 3 hours per week.

**General Course Purpose**

This course is primarily to give the student an appreciation for the use of mathematics as a tool (applications and mathematical modeling), as well as developing problem solving and critical thinking abilities.

**Entry Level Competencies**

Prerequisite: MTH 181 - "Finite Mathematics I" or equivalent.

**Course Objectives**

As a result of the learning experiences provided in this course, the student should be able to:

- A. analyze an argument and determine whether it is valid or a fallacy,
- B. analyze counting problems and apply the appropriate counting techniques,
- C. compute the probability of the outcomes of a given experiment,
- D. understand the problems involved in collecting valid statistical data,
- E. analyze given data and interpret the results.

**Major Topics To Be Included**

- A. Logic
  - 1. Propositions and connectives
  - 2. Truth tables
    - a. DeMorgan's Law
    - b. Quantifiers
    - c. Negation
    - d. Converse, inverse, contrapositive
  - 3. Arguments
    - a. Validity versus truth
    - b. Rules of Inference
    - c. Direct and indirect proof
    - d. Proof by truth tables
- B. Counting Techniques
  - 1. Survey analysis problems
  - 2. Evaluation of  $P(n,r)$  and  $C(n,r)$
  - 3. Applications of the Fundamental Principle of counting
  - 4. Permutations
  - 5. Combinations
- C. Probability and Statistics
  - 1. Conditional probability
  - 2. Independent events
  - 3. Determination of odds

4. Expected value
  5. Bernoulli trials
  6. Random samples
  7. Mean, median mode, standard deviation
  8. Normal distribution
  9. Grouped data and histograms
- D. Mathematics of Finance
1. Compound interest
  2. Annuities
  3. Amortization
  4. Sinking funds

**Extra Topics (optional)**

- A. Probability and Statistics topics
1. Chi square (hypothesis testing)
  2. Linear correlation
  3. Linear regression
  4. Z-test
  5. t-test
  6. Normal approximation to the binomial distribution
- B. Computer terminal use
1. Turn on/off the computer
  2. Perform arithmetic operations =, -, \*, /
  3. Access library programs
  4. Enter data for library programs
  5. Read the solution