



## Course Number and Title: MAT 251 Finite Math

**Campus Location:**

Georgetown, Wilmington

**Effective Date:**

2018-51

**Prerequisite:**

MAT 153 or MAT 180

**Co-Requisites:**

None

**Course Credits and Hours:**

3.00 credits

3.00 lecture hours/week

0.00 lab hours/week

**Course Description:**

This course covers selected algebraic topics, including mathematics of finance, systems of linear equations and matrix algebra, linear programming, properties of probability and probability distributions, Markov chains, and techniques of applied problem solving.

**Required Text(s):**

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

**Additional Materials:**

Each student is required to have an electronic calculator capable of scientific calculations. The Math Department strongly recommends the TI-84. Calculators with CAS capabilities (TI-Inspire, TI89, HP-48, and HP-49 as examples) are inappropriate for this course and will not be permitted in test situations.

**Schedule Type:**

Classroom Course

Hybrid Course

**Disclaimer:**

None

**Core Course Performance Objectives (CCPOs):**

1. Solve linear equations and inequalities. (CCC 2, 6; PGC 1, 2)
2. Solve application problems using linear equations and inequalities. (CCC 2, 6; PGC 1, 2)
3. Solve mathematics of finance problems. (CCC 2, 6; PGC 1, 2)
4. Solve systems of linear equations, and perform matrix algebra. (CCC 2, 6; PGC 1, 2)
5. Solve optimization problems using linear programming techniques. (CCC 2, 6; PGC 1, 2, 4)
6. Solve written problems involving probability and probability distributions. (CCC 2, 6; PGC 1, 2)
7. Solve application problems using binomial probability distributions and Markov chains. (CCC 2, 6; PGC 1, 2)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

**Measurable Performance Objectives (MPOs):**

Upon completion of this course, the student will:

1. Solve linear equations and inequalities.
  1. Solve first degree equations in one variable.
  2. Solve linear inequalities in one variable.
  3. Solve quadratic equations using various factoring techniques.
  4. Solve quadratic functions using the quadratic formula.
2. Solve application problems using linear equations and inequalities.
  1. Apply linear and quadratic functions to profit and loss applications.
  2. Apply linear and quadratic functions to investment problems.
  3. Apply linear and quadratic functions to demand and supply problems.
  4. Perform cost calculations using linear equations.
3. Solve mathematics of finance problems.
  1. Apply linear and quadratic functions to finance applications.
  2. Perform calculations involving simple interest.
  3. Perform calculations involving compound interest.
  4. Determine the final amount in annuities when given the interest rate and the amount of regular contributions.
  5. Find the present value of an annuity given a payment schedule.
4. Solve systems of linear equations, and perform matrix algebra.
  1. Algebraically solve systems of linear equations in multiple variables.
  2. Solve linear systems in multiple variables using matrices.
  3. Perform addition and subtraction of matrices.
  4. Find products and powers of matrices.
  5. Solve application problems using matrices.
5. Solve optimization problems using linear programming techniques.
  1. Solve systems of linear inequalities using graphs.
  2. Interpret linear inequalities as constraints in linear programming models.
  3. Maximize and minimize an objective function given particular constraints.
  4. Solve maximizing and minimizing applications using linear programming.
6. Solve written problems involving probability and probability distributions.
  1. Use set theory to determine subsets, compliments, intersections, and unions.
  2. Use Venn diagrams to show relationships between sets.
  3. Solve problems using basic concepts of probabilities.
  4. Calculate conditional probability and probability of independent events.
  5. Find the expected value of an event using given conditions.
  6. Calculate the number of outcomes using permutations and combinations.
  7. Use counting techniques to solve probability application problems.
7. Solve application problems using binomial probability distributions and Markov chains.
  1. Use binomial probability to find the expected value in repeated trials.
  2. Transform a set of real life probabilities into a transition matrix in a Markov chain.
  3. Recognize a regular Markov chain, and find and interpret its equilibrium vector.

**Evaluation Criteria/Policies:**

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

|    |   |     |   |   |
|----|---|-----|---|---|
| 92 | - | 100 | = | A |
| 83 | - | 91  | = | B |
| 75 | - | 82  | = | C |
| 0  | - | 74  | = | F |

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

**Core Curriculum Competencies (CCCs are the competencies every graduate will develop):**

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

**Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):**  
**Middle-Level Mathematics Education**

1. Employ mathematical strategies to solve algebraic, geometric, trigonometric, and calculus problems.
2. Analyze mathematical principles and theories as they relate to a variety of applications.
3. Utilize knowledge of the physical, social, emotional and cognitive development of adolescents in designing and delivering instruction.
4. Access and implement educational technology.

**Disabilities Support Statement:**

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.