



Course Number and Title: MAT 279 Problem Solving Strategies

Campus Location:

Dover, Stanton

Effective Date:

2018-51

Prerequisite:

MAT 263 or higher

Co-Requisites:

None

Course Credits and Hours:

4.00 credits

4.00 lecture hours/week

0.00 lab hours/week

Course Description:

This course is a study of the various problem solving strategies used in mathematical problems. Emphasis is on the use of these strategies within the context of a traditional secondary mathematics curriculum. Activities include group work, application of educational technology, oral and written presentations, and a portfolio.

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:

TI-84 Graphing Calculator

Schedule Type:

Classroom Course

Disclaimer:

None

Core Course Performance Objectives (CCPOs):

1. Assess problem-solving strategies. (CCC 2, 5, 6; PGC 1, 2)
2. Choose models in the solution of problems. (CCC 1, 2, 5, 6; PGC 1, 2, 4)
3. Support the various roles of individuals in group problem solving. (CCC 3, 4)
4. Justify and communicate problem solutions. (CCC 1, 2, 3, 4, 5, 6; PGC 1, 2, 4)
5. Design mathematical problems to demonstrate specific types of problem-solving strategies. (CCC 1, 2, 4, 6; PGC 1, 2, 3, 4)
6. Compose an information-based document or presentation using appropriate research strategies. (CCC 1, 2, 4, 6; PGC 1, 2, 4)
7. Design an effective problem-solving strategies presentation. (CCC 1, 2, 3, 4; PGC 1, 2, 3, 4)
8. Present a problem-solving strategy lesson using appropriate educational technology. (CCC 2, 5, 6; PGC 1, 2, 4)

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. Assess problem-solving strategies.
 1. Formulate diagrams, systematic lists, and tables to be used in a solution.
 2. Interpret patterns, use guess and check, and eliminate possibilities in the construction of a solution to a problem.
 3. Construct physical representations and algebraic equations to represent and solve problems.
 4. Analyze a problem using the method of finite differences.
2. Choose models in the solution of problems.
 1. Create physical and algebraic models for a problem.
 2. Construct models for real-world, technological problems.
 3. Formulate diagrams, systematic lists, and tables to enhance the representation of a model.
3. Support the various roles of individuals in group problem solving.
 1. Manage a group.
 2. Defend solution methods to others in the group.
 3. Synthesize results obtained by the group(s).
 4. Critique problem-solving strategies while working in a group.
4. Justify and communicate problem solutions.
 1. Compose a solution to a problem.
 2. Use appropriate strategies to effectively communicate a solution to others.
 3. Prepare appropriate visual aids to enhance the presentation of a solution.
5. Design mathematical problems to demonstrate specific types of problem-solving strategies.
 1. Construct classroom problems to develop a particular problem-solving strategy.
 2. Formulate mathematical problems using proper mathematical language and terminology.
 3. Compare the effectiveness of different problem-solving strategies.
6. Compose an information-based document or presentation using appropriate research strategies.
 1. Identify, select, and evaluate reputable sources of information.
 2. Summarize and quote information from appropriate sources.
 3. Document sources according to American Psychological Association (APA) guidelines.
 4. Analyze, organize, and use information to produce an effective research document or presentation.
7. Design an effective problem-solving strategies presentation.
 1. Work in groups to successfully complete the project.
 2. Discuss facets of the project, and assume appropriate roles.
 3. Employ group interaction skills to support other group members with tolerance and respect.
 4. Manage and resolve conflict within a group to strengthen team cohesiveness and effectiveness.
8. Present a problem-solving strategy lesson using appropriate educational technology.
 1. Produce effective documents to be used by students participating in the problem-solving strategy lesson.
 2. Employ educational technology to develop visuals for the presentation of a problem-solving strategy lesson.
 3. Combine technology to produce an organized, effective problem-solving strategy lesson.

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):

1. Employ mathematical strategies to solve algebraic, geometric, trigonometric, and calculus problems.
2. Prove or disprove mathematical statements using formal arguments.
3. Apply knowledge of the physical, social, emotional and cognitive development of adolescents.
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.