



## Course Number and Title: CEN 200 Introduction to MATLAB

**Campus Location:**

Georgetown, Dover, Stanton, Wilmington

**Effective Date:**

2018-51

**Prerequisite:**

CEN 180 or CIS 120 or CSC 114) and (ELC 225 or ELC 266 or concurrent) and MAT 190

**Co-Requisites:**

None

**Course Credits and Hours:**

2.00 credits

1.00 lecture hours/week

2.00 lab hours/week

**Course Description:**

This course provides an introduction to the basic principles of programming and implementation of mathematical and electrical engineering technology concepts using MATLAB.

**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:**

USB flash-drive, Scientific calculator

**Schedule Type:**

Classroom Course

**Disclaimer:**

None

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

1. Design and implement programs to solve mathematical and engineering applications using MATLAB. (CCC 2, 6; PGC 1, 3)
2. Develop well-documented programs that clearly illustrate their logic and function. (CCC 2, 6; PGC 1, 3)
3. Select and use simple and compound conditionals, selection, and repetition structures to design and implement MATLAB programs. (CCC 2, 6; PGC 1)

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. Design and implement programs to solve mathematical and engineering applications using MATLAB.
  1. Solve simple problems in the MATLAB command window.
  2. Identify and use various MATLAB windows.
  3. Explain the order in which operations are performed in a MATLAB program.
  4. Express the program's calculated results in floating-point, scientific, and engineering notation.
  5. Convert between degrees and radians to analyze an alternating current (AC) circuit using MATLAB.
  6. Perform scalar, array, and matrix calculations to analyze direct current (DC) and AC circuits using MATLAB.
  7. Select and use appropriate string manipulation functions in a MATLAB program.
  8. Write a program that uses trigonometric functions to analyze an AC circuit.
  9. Write a program to determine the currents in a non-series parallel circuit by solving a system of linear equations with matrices.
  10. Write a program that uses differential equations to solve signal transients.
  11. Develop debugging and testing skills to build robust programs.
  12. Write a program to create and properly label a two-dimensional plot.
  13. Write a program to plot the input and output signals of an AC circuit that requires use of scalar, array, and matrix calculations.
  14. Load and manipulate audio and image files.
2. Develop well-documented programs that clearly illustrate their logic and function.
  1. Choose self-documenting names to identify the purpose of variables and functions.
  2. Develop a MATLAB program from an algorithm.
  3. Create a flowchart using structured analysis techniques.
  4. Write effective software documentation using comments, indentation, and style conventions.
3. Select and use simple and compound conditionals, selection, and repetition structures to design and implement MATLAB programs.
  1. Use relational and logical operators in selection and repetition structures to determine what commands are executed.
  2. Use 'if-then-else' statement to conditionally execute statements.
  3. Use the 'while' statement to repetitively execute statements.
  4. Use the 'for' statement to execute statements a fixed number of times.
  5. Describe the uses and advantages of functions.
  6. Implement function calls.

**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. Integrate modern tools of the engineering discipline into the field of study.
2. Apply mathematics, science, engineering, and technology theory to solve electrical and computer engineering and electronics engineering technology problems.
3. Conduct, analyze, and interpret experiments using analysis tools and troubleshooting methods.
4. Identify, analyze, and solve electrical and computer engineering and electronics engineering technology problems.
5. Explain the importance of engaging in self-directed continuing professional development.
6. Demonstrate basic management, organizational, and leadership skills that commit to quality, timeliness, and continuous improvement.

**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.

