

**PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS**

**MATRIX COMPUTATIONS
MATH 2000**

Class Hours: 1
Laboratory Hours: 0

Credit Hours: 1
Revised: Fall 2016

Catalog Course Description:

Introduction to matrix computations, including determinants, eigenvalues and eigenvectors. For students in engineering transfer programs.

Prerequisite:

MATH 1920 or consent of instructor

Textbook(s) and Other Course Materials:

Textbook:

None. All required reading material is posted online.

Personal Equipment:

A calculator with matrix capabilities.

References:

Anton, Howard. *Elementary Linear Algebra*. 10th ed. Hoboken: John Wiley & Sons, Inc., 2010. Print.

Kolman, Bernard & David R. Hill. *Elementary Linear Algebra with Applications*, 9th ed. Upper Saddle River, NJ: Pearson, 2008. Print.

Spence, Lawrence, et al. *Elementary Linear Algebra: A Matrix Approach*, 2nd ed. Upper Saddle River, NJ: Pearson, 2008. Print.

Larson, Ron, et al. *Elementary Linear Algebra*, 5th ed. Boston: Houghton Mifflin, 2004. Print.

Week/Unit/Topic Basis:

Unit Topic

1. Matrix Operations and Special Matrices.
2. Linear Systems and Elementary Row Operations.

3. Introduction to Inverse Matrices and Determinants
4. Determinants & Cramer's Rule.
5. Applications I.
6. Vectors and Vector operations.
7. Vector Spaces, Linear Independence, Null Space, & Rank.
8. Eigenvalues and Eigenvectors.
9. Applications II.

Course Goals*:

- A. Become familiar with matrix operations and the n-tuple. VI.5
- B. Become familiar with geometric vectors and their operations and orthogonality. VI.1,2
- C. Solve systems of linear equations. VI.1,2
- D. Learn how to compute and use determinants. VI.2,3,5
- E. Understand and apply the concepts of eigenvalues and eigenvectors. VI.4
- F. Use matrices and technology to solve real-life applications. VI.3,4,6

*Roman numerals after course goals reference the General Education Goals of the Mathematics Program.

Expected Student Learning Outcomes*:

Upon successful completion of this course, the student should be able to:

1. Explain what a matrix is and work comfortably with matrices and n-tuples. A
2. Use technology to perform matrix operations. A, F
3. Understand and work with geometric vectors and apply the concept of orthogonality. B
4. Use row operations on an augmented matrix to find sets of n-tuples that satisfy a linear system. C
5. Establish conditions under which solutions to linear systems exist. C
6. Work with square matrices, matrix inverses and determinants. A, D, F
7. Use a square matrix to find eigenvalues and eigenvectors. E
8. Use matrices to solve problems in various fields of engineering and the sciences. F

*Capital letters after Expect Student Learning Outcomes reference the course goals listed above.

Evaluation:

- A. Testing Procedures:** 100% of grade
Students are evaluated primarily on the basis homework, a midterm, and a final exam.
- B. Laboratory Expectations:**
None
- C. Field Work:**
None
- D. Other Evaluation Methods:**
As assigned by instructor.
- E. Grading Scale:**

93-100	A
88-32	B+
83-87	B
78-82	C+
70-77	C
60-69	D
Below 60	F

Policies:

A. Attendance Policy:

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic Affairs, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one's own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

C. Accommodations for disabilities:

Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Disability Services (DS) in order to receive accommodations in this course. [Disability Services](http://www.pstcc.edu/sswd/) (<http://www.pstcc.edu/sswd/>) may be contacted via [email](#) or by visiting Alexander 130.