Montgomery County Community College
MAT 220
Linear Algebra
4-4-0

COURSE DESCRIPTION:
A one semester course in linear algebra. Topics include vector spaces, matrices, and linear transformations, eigenvalues and eigenvectors, determinants, function spaces, and applications. It can be taken concurrently with MAT 202 or MAT 223. A graphing calculator is required for class, homework and testing. Classroom instruction and programs will be presented using a TI-86 or TI-92.

REQUISITES:
Previous Course Requirements
  − MAT 201 Calculus and Analytic Geometry II with a minimum grade of "C"

Concurrent Course Requirements
None

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS
1. Solve an n x m system of linear equations and discuss the uniqueness of the solution (if one exists).	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
2. Rewrite a system of equations as a vector equation or as a matrix equation.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
3. Perform basic matrix operations as well as be able to deal with matrix partitions and matrix factorizations.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
4. Explain the determinant function as a real-valued function of a matrix variable.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
5. Define a vector space and demonstrate how closely it resembles R^n.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
6. Explain the characteristics of a linear transformation.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
7. Verbalize an appreciation for the applications of linear algebra in a wide variety of fields.	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria*.

SEQUENCE OF TOPICS:
1. Systems of Linear Equations and Matrices
2. Determinants
3. Graph Theory
4. Vectors in 2-Space and 3-Space
5. Constructing Curves and Surfaces through Specified Points
6. Euclidean Vector Spaces
7. General Vector Spaces
8. Inner Product Spaces
9. Eigenvalues, Eigenvectors

LEARNING MATERIALS:

Textbook:
Kolman, Hill. (2008). *Elementary Linear Algebra* (9th ed.). Pearson. ISBN #978-0-471-433309.

Calculator:
A calculator is required for this course. Please see instructor.

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:

Prepared by:	Edwina K. Smith, Professor of Mathematics	Date:	1/1997
Revised by:	Aileen D. Conway, Assoc. Professor of Mathematics	Date:	4/1998
Revised by:	Aileen D. Conway, Assoc. Professor of Mathematics	Date:	1/2003
Revised by:	Walter R. Hunter, Professor of Mathematics	Date:	10/2004
Revised by:	Mark McFadden	Date:	2/1/2013

VPAA/Provost or designee Compliance Verification:

Victoria L. Bastecki-Perez, Ed.D.	Date:	2/18/2013

Revised by:	Marion Graziano/James Muscatell	Date:	8/31/2017
VPAA/Provost or designee Compliance Verification:		Date:	11/13/2017

This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.