MATH 275: LINEAR ALGEBRA

1. Course Information

Subject
MATH - Mathematics

Course Number
275

School
Science, Technology, Engineering, Mathematics

Course Title
Linear Algebra

2. Hours

Semester Hours
3.00000

Lecture
3

Lab
0

Practicum
0

3. Catalog Description

For display in the online catalog
This course covers topics in linear algebra, including systems of linear equations, Gaussian Elimination, matrices and determinants, vector spaces, linear transformations, eigenvalues, eigenvectors, and applications.

4. Requisites

Prerequisites
MATH 266

Corequisites
None

5. Course Type

Course Fee Code
1

Course Type for Perkins Reporting
non-vocational (not approved for Perkins funding)

6. Justification

Describe the need for this course
There are many new demands for mathematical skills in a variety of fields. This course has become an important tool for students in mathematics, science, computer science and engineering majors. It provides the background required course for mathematics and engineering majors at many four-year institutions.

7. General Education

Will the college submit this course to the statewide General Education Coordinating Committee for approval as a course, which satisfies a general education requirement?

Yes

General Education Category

Mathematics

General Education Status

Approved

8. Consistency with the Vision and Mission Statements, the Academic Master Plan, and the strategic initiatives of the College

Please describe how this course is consistent with Ocean County College's current Vision Statement, Mission Statement, Academic Master Plan, and the strategic initiatives of the College:

	Add item
1	This course helps to prepare students to become intentional learners who will be able to understand and employ quantitative analysis to solve problems, and demonstrate intellectual agility in mathematics.

9. Related Courses at Other Institutions

Comparable Courses at NJ Community Colleges

Institution

Atlantic Cape CC

Course Title

Linear Algebra

Course Number

MATH 152

Number of Credits

4

Institution

Brookdale CC

Course Title

Linear Algerbra

Course Number

MATH 285

Number of Credits

3

Institution

Mercer County CC

Course Title

Linear Algebra

Course Number

MAT 208

Number of Credits

4

Institution
Camden County College

Course Title
Linear Algebra

Course Number
MATH 145

Number of Credits
4

Institution
Rowan College at Burlington County

Course Title
Linear Algebra

Course Number
MATH 201

Number of Credits
3

Transferability of Course

Georgian Court University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
MA209, Linear Algebra, 3	GE	

Kean University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
MATH 2995, Matrix & Linear Algebra, 3	GE	

Monmouth University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
MA221, Linear Algebra, 3	GE	

Rowan University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
MATH01210, Linear Algebra, 3	GE	

Rutgers - New Brunswick, Mason Gross School of the Arts

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
01640250, Introductory Linear Algebra, 3	GE	

10. Course Learning Outcomes

Learning Outcomes

	Students who successfully complete this course will be able to:
CLO1	Perform appropriate operations with matrices and determinants.
CLO2	Demonstrate knowledge of the mathematical concepts and procedures involving multi-dimensional vector spaces.
CLO3	Solve problems involving linear transformations, eigenvalues and eigenvectors.
CLO4	Analyze and solve problems involving applications of complex linear models utilizing the linear algebra concepts developed in the course.

11. Topical Outline

(include as many themes/skills as needed)

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
TO1	Systems of Linear Equations a) Introduction to Systems of linear equations b) Solutions using Matrix Reduction techniques	Homework exercises from text	Graded take-home assignments; In-class tests	CLO1, CLO4
TO2	Matrices Matrix Operations and Properties.	Homework exercises from text	Graded take-home assignments; In-class tests	CLO1, CLO4
TO3	Determinants Operations and Properties of the Determinant.	Homework exercises from text	Graded take-home assignments; In-class tests	CLO1, CLO4
TO4	Vector spaces a) Definition and Properties of Vector Spaces and Subspaces. b) Understand relationship of Matrices and Vector spaces	Homework exercises from text	Graded take-home assignments; In-class tests	CLO2
TO5	Inner Product Spaces a) Definition and properties of inner products. b) Apply properties to various problems, including least squares regression.	Homework exercises from text	Graded take-home assignments; In-class tests	CLO2
TO6	Linear Transformations a) Definition and properties of linear transformations. b) Understand relationship between Matrices and linear transformation	Homework exercises from text	Graded take-home assignments; In-class tests	CLO3

TO7	Eigenvalues and eigenvectors a) Definition and properties of eigenvalues and eigenvectors. b) Learn how to determine both and apply to solving various problems.	Homework exercises from text	Graded take-home assignments; CLO3 In-class tests
TO8	Applications	Homework exercises from text	Graded take-home assignments; CLO4 In-class tests

12. Methods of Instruction

In the structuring of this course, what major methods of instruction will be utilized?
Lecture
o Class discussion
o Group work
o Computer applications

13. General Education Goals Addressed by this Course (this section is to fulfill state requirements)

Information

_____

Quantitative Knowledge and Skills
Yes

Related Course Learning Outcome
All

Related Outline Component
All

Assessment of General Education Goal (Recommended but not limited to)
Exams, Quizzes

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14. Needs

Instructional Materials (text etc.):
An appropriate textbook or open educational resource will be selected. Please contact the department for the current adoption

Technology Needs:
Graphing calculator Computer software Converge

Human Resource Needs (Presently Employed vs. New Faculty):
Presently Employed Faculty

Facility Needs:
None

Library needs:
None

15. Grade Determinants

The final grade in the course will be the cumulative grade based on the following letter grades or their numerical equivalents for the course assignments and examinations

A: Excellent

B+: Very Good

B: Good

C+: Above Average

C: Average

D: Below Average

F: Failure

I: Incomplete

R: Audit

For more detailed information on the Ocean County College grading system, please see Policy #5154.

16. Board Approval

History of Board approval dates
Reviewed/Revised: December 1990; February 27, 1996; April 30, 1996; December 1998; December 2003; May 4, 2004; February 28, 2006; March 8, 2006; June 2006
Board of Trustees Approval Date: November 6, 2006
Board of Trustees Approval Date: March 26, 2012
Board of Trustees Approval Date: January 26, 2016
Board of Trustees Approval Date: December 12, 2019