Textbooks: *Linear Algebra, 6th edition, Larson Falvo*
Calculator RequirementsA Ti-89 or Ti N-Spire is required

Catalog Description:
Vector, vector functions, linear functions, solutions of systems of linear equations, matrices, determinants and eigenvalues.

Context: This course supports the following institutional goals (IG), the goals of the Bible and liberal arts core (BL), and the Division of Mathematical Science goals (MS)

IG 3: To develop in students Christ-like character through disciplined, Spirit-filled living.
IG 4: To direct students toward a biblical life view that integrates God's Truth into practical Christian living.
IG 5: To prepare students to excel intellectually and vocationally by offering diverse academic programs rooted in biblical truth and centered on a liberal arts core.
BL 3c: Will equip students to understand the physical world as God's creation, as a stewardship given to man, and as the physical expression of His glory
BL 4: Demonstrate critical thinking in analyzing, evaluating, and synthesizing information and ideas.
BL 5: Develop solutions to problems, working independently and with others, through critical and creative thinking.
MS 3 Provide the student a platform for continued learning and development of his God-Given abilities.
MS 5: Provide an appropriate liberal arts complement to a wide variety of majors.
MM 4. Provide a solid foundations for graduate studies in mathematics.

Course goals: This course is designed to

1. Ensure that students have the mathematical skills needed to be successful in everyday life. (IG 4, 5)
2. Demonstrate mathematics as a tool that reveals God's handiwork in the world around us. (BL 3c)
3. Develop Godly character traits such as self-discipline, perseverance, honesty, and precision. (IG 3)
4. Develop thinking and reasoning skills. (BL 4, 5)
5. Mature the student in the theory and application of mathematics (MS1)
6. Provide a foundation for other mathematics, science, or computer courses. (MS 5)
7. For those students taking Abstract Algebra, this will be the first course in which terms such as kernal, homomorphism, isomorphism are found. Learn these concepts well and it will keep you in good stead later. (MS3 and MM 4)

Course Objectives:

	The students will be able to	**Course Goals Supported**	**Course Content**	**Assessment**
1.	To find a row echelon form or the reduced row echelon form of a system of equations via Gaussian(Gauss-Jordon) elimination	CG 1, CG 3, CG 5	Chapter 1	Hw, Test
2.	To determine the solutions of a system of equations by looking at its RREF form.	CG 3, CG 4	Chapter 1	HW, Test
3.	Apply linear systems to problems such as curve fitting, Network Analysis, Chemical Reaction	CG 2, CG 4, CG 5	Chapter 1	HW
4.	Perform operations on Matrices	CG 1, CG 3, CG 5	Chapter 2	HW, Quiz, Test
5.	Know the algebraic properties of Matrices.	CG 1, CG 3, CG 5, CG 7	Chapter 2	HW, Quiz, Test,
6.	Find Inverses of Matrices	CG 1, CG 3CG 5	Chapter 2	HW, Test

7.	Perform elementary row operations on Matrices, both directly and by multiplying the appropriate matrix on the left.	CG 1, CG 2, CG 3, CG 4, CG 5	Chapter 2	HW, Test
8.	Apply the operations of matrices to answer questions in stochastics, cryptography and Leontief input-output models.	CG 2, CG 4, CG 5	Chapter 2	HW, Test
9.	Find Determinants of Matrices	CG 1, CG 3, CG 5	Chapter 3	HW, Quiz, Test
10.	Evaluate Determinants via elementary row operations	CG 1, CG 2, CG 3, CG 4, CG 5, CG 7	Chapter 3	HW, Quiz, Test
11.	To Know when a square matrix is invertible or not, and to write an invertible matrix as a product of elementary matrices	CG 1, CG 2, CG 3, CG 4, CG 5, CG 6, CG 7	Chapter 3	HW, Test
12.	To find the eigenvalues and eigenvectors of a matrix.	CG 2, CG4	Chapter 3	HW, Test
13.	To define a Vector space and be able to determine if a set is a vector space	CG 1, CG 3, CG 5	Chapter 4	HW, Quiz, Test
14.	To determine if a set is a subspace of an exiting vector space	CG1, CG2, CG 3, CG 4, CG 5	Chapter 4	HW, Quiz, Test
15.	To determine is a set is a linear independent, or spans a set, or is a basis for a vector space.	CG1, CG 3, CG 5, CG 7	Chapter 4	HW, Quiz, Test
16.	To find a basis for the row space or column space of a matrix	CG1, CG 3, CG 5, CG 7	Chapter 4	HW, Quiz, Test
17.	To determine the rank of matrix and the dimension of a subspace	CG 1, CG 3, CG 5	Chapter 4	HW, Test
18.	To find a coordinate matrix, relative to and set of basis	CG 1, CG 2 CG 3, CG 4, CG 5, CG 7	Chapter 4	HW, Test
19.	To define and determine if a space is an inner product space	CG 1, CG 3, CG 5, CG 6, CG 7	Chapter 5	HW, , Test
20.	To determine the length of an vector, and the angle between vectors in an inner product space	CG 1, CG 2 CG 3, CG 4 CG 5, CG 6, CG 7	Chapter 5	HW, Test
21	To find an orthonormal basis for a given basis in an inner product space using the Gram- Schmidt process	CG 1, CG 2 CG 3, CG 4, CG 5, CG 6, CG 7	Chapter 5	HW, Test
22	Find a Fourier approximation to a polynomial	CG 1, CG 2 CG 3, CG 4, CG 5, CG 6, CG 7	Chapter 5	HW, Test
23.	To define and determine if a transformation is a linear transformation	CG 1, CG 2 CG 3, CG 4, CG 5, CG 6, CG 7	Chapter 6	HW, Quiz, Test
24.	To find a basis for the kernal, domain, and range of a linear transformation	CG 1, CG 2 CG 3, CG 4, CG 5, CG 6, CG 7	Chapter 6	HW, Test
25.	To determine if a linear transformation is 1-1 or onto	CG 1, CG 2 CG 3, CG 4, CG 6, CG 7	Chapter 6	HW, Test
26.	To write a linear transformation as a matrix.	CG 1, CG 2 CG 3, CG 4, CG 5, CG 6, CG 7	Chapter 6	HW, Test
27/	To determine if two matrices represent the same linear transformation, that is if they are	CG 1, CG 2 CG 3, CG 4, CG 5, CG 6, CG 7	Chapter 6	HW, Test

	similar.			