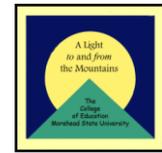




Morehead State University
Professional Education Unit
College of Science and Technology
Department of Mathematics and Computer Science



Math 301-001: Elementary Linear Algebra (face-to-face)
Spring 2011 MWF 1:50 – 2:50

Instructor: R. Duane Skaggs, PhD

E-mail: d.skaggs@moreheadstate.edu

Office Hours: TThF1F2 12:40 - 1:40, W 3:00 - 4:00, plus appointments.

Office: LA 204E

Phone: 1.606.783.2848

Catalog Course Description: MATH 301. Elementary Linear Algebra. (3-0-3); II. *Prerequisite:* MATH 175 or consent of instructor. Vector spaces; determinants; matrices; linear transformations; eigenvectors.

Course Description:

We will explore elementary linear algebra through computational, geometric, algebraic, and theoretical means. While much of the emphasis will be on the basic principles through understanding computational and geometric aspects, this will be balanced by an introduction to abstract notions (and some proofs). Where appropriate, the linear algebra software *MATLAB* will be used as a powerful calculator for completing certain problems.

Textbook: J. Defranza and D. Gagliardi, *Introduction to Linear Algebra*, McGraw-Hill. We will cover as much of the entire text as possible, with the possible exception of Sections 3.5 and 5.3.

Required Field Experience: Not Applicable.

“Community Engagement: A Light to and From the Mountains”

The Professional Education Unit in the Department of Mathematics and Computer Science at Morehead State University delivers rigorous, high quality programs and courses that prepare professionals informed by NCTM and MAA standards- preparing professionals to improve the schools, quality of life, and the communities in which they live and serve. This statement is not only the strategic mission for the department, but it also incorporates the conceptual framework that guides its activities.

Conceptual Framework Outcomes (CFO)

The Unit and the faculty within individual programs assess the degree to which its graduates:

- 1) Master the content knowledge, professional and the twenty-first century skills need to make an optimal contribution to “whole” student learning in education settings.
- 2) Are competent in the collection and use of data to inform decision-making and to demonstrate accountability for student learning.
- 3) Demonstrate professional dispositions.
- 4) Are culturally competent and understand the regions from which they have come utilizing knowledge and experiences to effectively “bridge the gaps” (economic, achievement, and geographic) ensuring optimal learning for all students.
- 5) Engage in authentic field experiences in collaboration with committed school – based partners and are empowered to improve the quality of education throughout this region and beyond.

Student Learning Outcomes (SLO)

Students will be able to:

1. Build new mathematical knowledge through problem solving.
2. Select and use various types of reasoning and methods of proof and to develop an inquisitive and exploratory approach to mathematics.
3. Communicate mathematical thinking coherently and clearly to peers, professors, and others.
4. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
5. Use multiple representations to model and interpret physical, social, and mathematical phenomena.

Grading:

Your grade will be based on homework, quizzes, three exams, and a comprehensive final exam. The traditional 60 - 70 - 80 - 90 scale will be in effect.

Homework, in-class assignments, and quizzes	49%
Exam 1	9%
Exam 2	9%
Exam 3	9%
Final Exam	24%

Academic misconduct will be handled in accordance with MSU policy and may result in failure on quizzes, exams, or the entire course.

Explanations of assignments are given in the following tables.

NCATE/EPBSB Accreditation Alignment of CFO's and SLO's

Program: MATH 301: Elementary Linear Algebra					
Aligned with Assessment (point values)	Kentucky Teacher Standards (KYS)	Kentucky Core Academic Standards (KCAS)	Education Professional Standards Board (EPBSB)	NCTM	NCATE
Exam 1 (9%) CFO: 1 SLO: 1,2,3,4,5	1	Number and Quantity Algebra Functions	N/A	1-5, 9, 13	1
Exam 2 (9%) CFO: 1 SLO: 1,2,3,4,5	1	Algebra Geometry Statistics & Probability	N/A	1-5, 9, 13	1
Exam 3 (9%) CFO: 1 SLO: 1,2,3,4,5	1	Algebra Functions Geometry	N/A	1-5, 9, 13	1
Homework, in-class assignments, and quizzes (49%) CFO: 1 SLO: 1,2,3,4,5	1	Number and Quantity Algebra Functions Modeling Geometry Statistics & Probability	Closing the Achievement Gap	1-5, 9, 13	1

Assignment Descriptions

Program: MATH 301: Elementary Linear Algebra	
Assessment (point value)	Description
Exam 1 (9%)	Systems of linear equations and matrices.
Exam 2 (9%)	Linear combinations, linear independence, eigenvalues, and eigenvectors.
Exam 3 (9%)	Vector spaces and linear transformations.
Homework, in-class assignments, and quizzes (49%)	<p>The standing homework assignment in each section is any problem number ending in a 1 or a 6. These problems are for practice and will not be collected. However, mathematics is like playing guitar or basketball. Some parts need to become automatic; the only way for this to happen is with LOTS of practice. So you should complete not only the assigned problems but also many others in each section. Each of the quizzes will consist of two or three problems from the sections already covered.</p> <p>Homework assignments which will be graded will be available in class and on Blackboard about one week before they are due. It is acceptable (and encouraged!) to work together on these problems, but each student should turn in individual writeups and clearly indicate all collaborators. Since one goal of this class is learning to communicate mathematics, the assignments should be neat and precise, with correct notation and explanations suitable for a fellow student to understand.</p>
Final Exam (24%)	The comprehensive final exam will cover all material from the first three exams along with inner product spaces.

Tentative Schedule

Week	Dates	Content/Exam
1	18-21 January	Linear equations
2	24-28 January	Matrix algebra
3	31 January – 4 February	Determinants
4	7-11 February	Applications
	Wednesday, 16 February	Exam 1
5	14-18 February	Vectors
6	21-25 February	Linear combinations
7	28 February – 4 March	Linear independence
8	7-11 March	Eigenvalues and vectors
9	14-18 March	Diagonalization
	Friday, 18 March	Exam 2
Spring Break	21 – 25 March	*****
10	28 March – 1 April	Vector spaces, subspaces
11	4-8 April	Basis and dimension
12	11-15 April	Linear transformations and isomorphisms
	Wednesday, 20 April	Exam 3
13	18-22 April	Inner product spaces
14	25-29 April	Orthonormal bases and orthogonal complements
15	2-6 May	Applications
Finals	Final Exam	Comprehensive

Attendance Policy

Attendance and participation in all classes is expected. Please notify the instructor by email if you will not be in class. Makeup exams will be given with a valid excuse.

Other Information

- Midterm grades are due Monday, 14 March.
- The last day to withdraw from the class is 31 March.

Academic Honesty

Cheating, fabrication, plagiarism or helping others to commit these acts will not be tolerated. Academic dishonesty will result in severe disciplinary action including, but not limited to, failure of the student assessment item or course, and/ or dismissal from MSU. If you are not sure what constitutes academic dishonesty, read the Eagle: Student Handbook or ask your instructor. An example of plagiarism is copying information from the internet when appropriate credit is not given. The policy is located at

<http://morehead-st.edu/units/studentlife/handbook/academicdishonesty.html>

Americans with Disabilities Act (ADA)

In compliance with the ADA, all students with a documented disability are entitled to reasonable accommodations and services to support their academic success and safety. Though a request for services may be made at any time, services are best applied when they are requested at or before the start of the semester. To receive accommodations and services the student should immediately contact the Disability Services Coordinator, ADUC 204E, 606-783-5188, <http://www2.moreheadstate.edu/acs/>

Campus Safety Statement

Emergency response information will be discussed in class. Students should familiarize themselves with the nearest exit routes in the event evacuation becomes necessary. You should notify your instructor at the beginning of the semester if you have special needs or will require assistance during an emergency evacuation. Students should familiarize themselves with emergency response protocols at

<http://www.moreheadstate.edu/emergency>