SUNY OLD WESTBURY

Department of Mathematics, Computer & Information Science

Advanced Linear Algebra

MA 4160 • SYLLABUS SPRING 2017

Professor: **Frank Sanacory**

Office: **NAB 2014** *Email:* SanacoryF@oldwestbury.edu

Course Web Site: **sanacory.net** *Office Hours:* **M 3:50PM – 4:45PM, TR 1:00PM – 2:30PM**

TEXTBOOK: Elementary Linear Algebra, 11th Edition by Howard Anton. 2013. ISBN-10: 1118473507.

PREREQUISITES: Grade of C or higher in Linear Algebra MA 3160 and grade of C or higher in Discrete Mathematics MA 3030.

COURSE DESCRIPTION: This course is a proof based course. We extend the ideas from MA3160: Linear Algebra to more abstract structures and study linear operators in detail. We will study inner product spaces, orthonormal bases and normed spaces, duality on infinite dimensional vector spaces, spectral theorems and the decomposition of operators . This course in a sense is backwards form the traditional treatment of linear algebra. The last idea introduced is the determinant (a MA 3160: Linear Algebra topic). We will introduce the determinant from scratch and define it in geometric or combinatorial terms.

COURSE OBJECTIVES: As in all proof based courses, the student should be able to write complete and clear mathematical proofs. Also the successful student should be able to compute a dual space, compute minimal polynomials, use the Canonical Forms. And identify an inner product space and prove that the space is an inner product space. rove the basic properties. Compute spectra and the decompositions of Linear Operators.

And a successful should know what the determinant is.

COURSE EVALUATION & GRADING: Your grade for the course will be based on your homework/quiz performance (15%), two tests (50%) and a comprehensive final exam (35%).

A = [94, 100]	B+ = [87, 89]	C+ = [77, 79]	D+ = [67, 69]	
A- = [90, 93]	B = [84, 86]	C = [74, 76]	D = [64, 66]	F = [0, 59]

	B- = [80, 83]	C- = [70, 73]	D- = [60, 63]	

CALCULATOR: No calculator is allowed nor needed.

TUTORING: Tutoring is available in the Mathematics Learning Center in **the library**.

ACCOMMODATIONS FOR STUDENTS WITH SPECIAL NEEDS:

If you have or suspect you may have a physical, psychological, medical or learning disability that may impact your course work, please contact Stacey DeFelice, Director, The Office of Services for Students with Disabilities (OSSD), NAB, 2065, Phone: 516-628-5666, Fax (516) 876-3005, TTD: (516) 876-3083. E-mail: defelices@oldwestbury.edu.

The office will help you determine if you qualify for accommodations and assist you with the process of accessing them. All support services are free and all contacts with the OSSD are strictly confidential. SUNY/Old Westbury is committed to assuring that all students have equal access to all learning activities and to social activities on campus.

RESPECT: No cell phones in class and no texting.

FINAL EXAM: Will be held Tuesday May 16, 2016 in our regular classroom at the regular class time.

Topics Covered

Chapter 4: General Vector Spaces

Chapter 5: Eigenvectors and Eigenvalues

Chapter 6: Inner Product Spaces

Chapter 7: Diagonalization and Quadratic Forms

Chapter 8: General Linear Transformations

Chapter 9: Numerical Methods

Canonical Forms

Infinite Dimension Spectral Theorem