MATH 550 Linear Algebra

DESCRIPTION

Basic properties of vector spaces and linear transformations, algebra of polynomials, characteristic values and diagonalizable operators, invariant subspaces and triangulable operators. The primary decomposition theorem, cyclic decompositions and the generalized Cayley-Hamilton theorem. Rational and Jordan forms, inner product spaces. The spectral theorem, bilinear forms, symmetric and skew symmetric bilinear forms. **PREREQUISITE**: Math 280

TEXTBOOKS

[**HK**] Linear Algebra, by K. Hoffman – R. Kunze, Second Edition.
[**A**] Linear Algebra Done Right, by S. Axler, Third Edition.

SYLLABUS + HOMEWORK + EXAMS

Week	Dates (2018)	Lectures	Homework	
		[HK]	Problems [HK]	Examples [A]
1	Sept 02 – 06	1.1, 2.1, 2.2 2.3	1.2-7, 8, 2.2-9 + **2.2-5** 6, 7, 8, 11, 14	1.33, 1.35, 1.43 2.6, 2.14, 2.16, 2.28, 2.40, 2.41 3.4, 3.10, 3.13, 3.18, 3.25, 3.27, 3.33, 3.34, 3.57, 3.68, 3.70, 3.75, 3.93, 3.100, 3.103, 3.104, 3.116
2	Sept 09 – 13	2.4 3.1	1, 2, 4, 5, 6 + Examples 19, 20 + **2.5-6** 12, 13	
3	Sept 16 – 20	3.2-3.3 3.4	3.2-11, 12 + Extras 12, 13 + Examples 16, 17	
4	Sept 24 – **29**	3.5 3.6-3.7	**12**, 13, 15, 17 + Examples 23, 24 + Corol. 1, 2 **3.6-1** + Corol. 2 + Proof of Theorem 23	
5	Sept 30 – Oct 04	6.1-6.2 6.3	6.2-8, 9, 11, 12, 15 + Examples 1, 2, 3 1, **2**, 10, 11 + Min. Poly. Examples 1, 2, 3 in 6.2	5.3, 5.8, 5.15, 5.18, 5.23, 5.33, 5.37, 5.40, 5.43, 5.45 8.25, 8.35, 8.45, 8.50, 8.51, 9.18, 9.22, 9.25
Exam 1: Saturday, October 6, 2018 ; 3:30 – 6:30 p.m. ; Room 59-1010				
6	Oct 07 – 11	6.4 6.5-6.6	11 + Examples 7, 8, 10 **6.5-1**, 5 + Proof of Theorem 8 + Extra	8.7, 8.12, 8.17, 8.28, 8.30 8.53, 8.54
7	Oct 14 – 18	6.7-6.8	Proof of Theorem 13	
8	Oct 21 – 25	7.1-7.2	7.1-3 + Proof of Theorem 4 + **Extras**	
9	Oct 28 – Nov 01	7.3 7.4	8 + Examples 5, 6 + **Extra** 3 + **Extra**	
10	Nov 04 – 08	7.5	[Summary → Theorem 13 (w/o proof)]	
Exam 2: Saturday, November 10, 2018 ; 3:30 – 6:30 p.m. ; Room 59-1010				
11	Nov 11 – 15	8.1-8.2	Examples 8, 9, 10, 11, 12, 13, 14 + **8.2-16**	6.4, 6.9, 6.17, 6.29, 6.33, 6.40, 6.44, 6.58 7.3, 7.4, 7.12, 7.19, 7.23, 7.30
12	Nov 18 – 22	8.3 8.4	**11** + Examples 16, 17, 19, 20 Examples 23, 24, 27, 28 + Extras	
13	Nov 25 – 29	8.5 9.5	Extras [Lecture]	
14	Dec 02 – 06	10.1 10.2	12, 14 + Examples 1, 4, 5 1, **6**, 17	
15	Dec 09 – 13	10.3	9	
Final: Saturday, December 15, 2018 ; 3:30 – 6:30 p.m. ; Room 59-1010				