Textbook: Kuttler – A First Course in Linear Algebra lyryx.com/first-course-linear-algebra/

Session	**Topic**	**Homework** Exercises from separate supplement **WW** Webwork problems
1	1.2 Systems of Equations, Algebraic Procedures (Gaussian Elimination) pp. 8-18	1.2.1 – 1.2.9 WW: Systems of Linear Equations WW: Gaussian Elimination
2	1.2 Systems of Equations, Algebraic Procedures (continued) pp. 18-27	1.2.10 – 1.2.15 WW: Gaussian Elimination (cont)
3	2.1 Matrix Addition and Scalar Multiplication 2.2 Matrix Multiplication 2.3 The Transpose pp. 49-71	2.1.1 - 2.1.2 2.2.1 2.3.1 – 2.3.4 WW: Matrix Operations
4	2.4 The Identity Matrix and Matrix Inverses 2.5 Finding the Inverse of a Matrix pp. 72-79	2.5.1 – 2.5.8 WW: The Inverse of a Matrix
5	2.5 Finding the Inverse of a Matrix (continued) pp. 79-82	2.5.9 – 2.5.10 WW: Characterizations of Invertible Matrices
6	2.6 Elementary Matrices pp. 84-92	2.6.1 – 2.6.7 WW: Elementary Matrices
7	3.1 Basic Techniques and Properties of Determinants pp. 109-121	3.1.1 - 3.1.3 WW: Introduction to Determinants
8	3.1 Basic Techniques and Properties of Determinants (continue) pp. 122-124	3.1.4 – 3.1.7 WW: Properties of Determinants
9	Exam 1 (sessions 1-7)	
10	3.2 Applications of the Determinant (Cramer's Rule) pp. 136-139	3.2.1 – 3.2.4 WW: Cramer's Rule
11	4.1-4.2 Vectors in $\mathbf{R}^n$ 4.3 Length of a Vector pp. 143-161	4.2.1-4.2.4, 4.3.1-4.3.4 WW: Vectors in Space WW: Norm and Distance
12	4.4 Dot Product, Projections pp. 161-171	4.4.1-4.4.6 WW: Dot Product WW: Projections
13	4.5 Cross Product	4.5.1-4.5.5

	pp. 171–176	WW: Cross Product
14	4.6 Parametric Lines pp. 180–185 4.7 Planes in $\mathbf{R}^3$ pp. 187–192	4.6.1–4.6.9 WW: Parametric Lines 4.7.1—4.7.4 WW: Planes in $\mathbf{R}^3$
15	4.8 Spanning and Linear Independence in $\mathbf{R}^n$ pp 195–197	4.8.1 — 4.8.3 WW: Spanning Sets
16	4.8 Spanning and Linear Independence in $\mathbf{R}^n$ (continued) pp 195–197	4.8.4 — 4.8.6 WW: Linear Independence
17	Review	
18	Midterm (1–16)	
19	4.9 Subspaces, Bases and Dimension pp. 206–217	4.9.1 — 4.9.6 WW: Subspaces of Rn WW: Coordinates and Basis
20	4.10 Row Space, Column Space and Null Space of a Matrix pp. 218–226	4.10.1 — 4.10.6 WW: Row Column and Null Spaces
21	4.11 Orthogonal and Orthonormal Sets and Matrices pp. 227–235	4.11.1 — 4.11.7 WW: Orthogonal Sets
22	5.1 Linear Transformations pp. 261–265	5.1.1 WW: Introduction to Linear Transformations
23	7.1 Eigenvalues and Eigenvectors of a Matrix pp. 339–352	7.1.1 - 7.1.4 WW: Eigenvectors and Eigenvalues WW: The Characteristic Equation
24	7.2 Diagonalization pp. 353–359	7.2.1 — 7.2.4 WW: Diagonalization
25	Exam 3 (19–23)	
26	7.3 Raising a Matrix to a Higher Power pp. 362–367	7.3.1–7.3.3
27	7.4 Orthogonal Diagonalization pp. 388–396	7.4.1 - 7.4.4
28	7.4 Quadratic Forms pp. 417–425	7.4.5, 7.4.6
29	Review	
30	Final Examination	

Supplementary Homework Problems

Chapter 4.11.2

Determine whether the matrix is orthogonal, and if so, find its inverse.

$$(a)\begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \\ -\frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \end{bmatrix} \quad (b)\begin{bmatrix} 1 & 0 & 0 \\ 0 & \frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}} \\ 0 & \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \end{bmatrix}.$$