Universidad Carlos III de Madrid

COURSE: ALGEBRA		
DEGREE: COMMUNICATION SYSTEM ENGINEERING	YEAR: 1	TERM: 1

WEEKLY PLANNING

WEEK	SESSION	GROUP	DESCRIPTION	LECTURE	PROBLEMS	EXAM	NOTES	CLASS	WEEKLY TOTAL
1	1	Large	● **PRESENTATION** ● **CHAPTER 1: COMPLEX NUMBERS** · Numbers sets · Necessity of complex numbers · Binomial form of a complex number · Graphical representation · Operations · Complex conjugate, modulus, argument · Polar form of a complex number	X			New Chapter!	1.66	7
	2	Small	● **CHAPTER 1: COMPLEX NUMBERS** **Problems**		X			1.66	
2	1	Large	● **CHAPTER 1: COMPLEX NUMBERS** · Roots of complex numbers · Exponential of a complex number · Solving equations · Mandelbrot set	X				1.66	7
	2	Small	● **CHAPTER 1: COMPLEX NUMBERS** **Problems**		X			1.66	
3	1	Large	● **CHAPTER 2: LINEAR EQUATIONS** · Introduction to Linear Equations · Geometrical Interpretation · Existence and Uniqueness · Matrix Notation · Gaussian Elimination · Row Equivalence and Echelon Forms	X			New Chapter!	1.66	7
	2	Small	● **CHAPTER 2: LINEAR SYSTEMS** **Problems**		X			1.66	
4	1	Large	● **CHAPTER 2: LINEAR EQUATIONS** · Solving Linear Systems · Homogeneous Systems · Simultaneous Solving · Systems with parameters	X				1.66	7
	2	Small	● **CHAPTER 2: LINEAR SYSTEMS** **Problems**		X			1.66	
5	1	Large	● **CHAPTER 3: THE VECTOR SPACE $\mathbb{K}^n$** · Vectors · Linear Subspace · Linear Combinations · Subspace Spanned by Vectors · Column and Row Spaces	X			New Chapter!	1.66	9
	2	Large	● **CHAPTER 3: THE VECTOR SPACE $\mathbb{K}^n$** · The Matrix Equation $Ax=b$ · Null Space · Revisiting Linear Systems	X				1.66	
	3	Small	● **CHAPTER 3: THE VECTOR SPACE $\mathbb{K}^n$** **Problems**		X	X		1.66	
6	1	Large	● **CHAPTER 3: THE VECTOR SPACE $\mathbb{K}^n$** · Linear Independence · Basis for a Linear Subspace · Dimension of a Linear Subspace · Basis for Col A, Row A and Nul A · Rank of a Matrix · Coordinate Systems	X				1.66	7
	2	Small	● **CHAPTER 3: THE VECTOR SPACE $\mathbb{K}^n$** **Problems**		X			1.66	

Week	Session	Group	Content					Hours	%
7	1	Large	● <u>**CHAPTER 3: THE VECTOR SPACE K^n**</u> · Coordinate Systems · Introduction to Linear Transformations	X				1.66	7
	2	Small	● **CHAPTER 3: THE VECTOR SPACE K^n** **Problems**		X			1.66	
8	1	Large	● <u>**CHAPTER 4: MATRIX ALGEBRA**</u> · Matrix Operations · Transpose of a Matrix · Conjugate Transpose of a Matrix · Inverse of a Matrix	X			New Chapter!	1.66	7
	2	Small	● **CHAPTER 4: MATRIX ALGEBRA** **Problems**		X			1.66	
9	1	Large	● <u>**CHAPTER 4: MATRIX ALGEBRA**</u> · Inverse of a Matrix · Partitioned Matrices · Determinants	X				1.66	7
	2	Small	● **CHAPTER 4: MATRIX ALGEBRA** **Problems**		X			1.66	
10	1	Large	● <u>**CHAPTER 5: EIGENVALUES & EIGENVECTORS**</u> · Eigenvalues & Eigenvectors · The Characteristic Equation · Diagonalization	X			New Chapter!	1.66	7
	2	Small	● **CHAPTER 5: EIGENVALUES AND EIGENVECTORS** **Problems**		X	X		1.66	
11	1	Large	● <u>**CHAPTER 5: EIGENVALUES & EIGENVECTORS**</u> · Change of Basis · Transformations between Linear Subspaces	X				1.66	7
	2	Small	● **CHAPTER 5: EIGENVALUES AND EIGENVECTORS** **Problems**		X			1.66	
12	1	Large	● <u>**CHAPTER 6: ORTHOGONALITY**</u> · Dot Product and Modulus · Orthogonal Sets · Unitary Matrices	X			New Chapter!	1.66	7
	2	Small	**PROBLEMS (To be determined)**		X			1.66	
13	1	Large	● <u>**CHAPTER 6: ORTHOGONALITY**</u> · Orthogonal Complement · Orthogonal Projection · The Gram-Schmidt Process	X				1.66	7
	2	Small	● **CHAPTER 6: ORTHOGONALITY** **Problems**		X			1.66	
14	1	Large	● <u>**CHAPTER 6: ORTHOGONALITY**</u> · Least-Squares Problems ● <u>**CHAPTER 7: NORMAL MATRICES**</u> · Schur Decomposition · Normal Matrices · Particular Cases of Normal Matrices	X			New Chapter!	1.66	7
	2	Small	● **CHAPTER 6: ORTHOGONALITY** **Problems** ● **CHAPTER 7: NORMAL MATRICES** **Problems**		X	X		1.66	
							Subtotal	48.14	100
			Total 1 *(Hours of class plus student homework hours between weeks 1-14)*					148.14	
15-16			**TUTORIALS AND EXAMEN PREPARATION**					28.36	
17			**FINAL EXAM**			X		3.5	
			Total 2 *(Hours of class plus student homework hours between weeks 15-18)*					31.86	
TOTAL (Total 1 + Total 2)								180	