Universidad Carlos III de Madrid

COURSE: ALGEBRA		
DEGREE IN INDUSTRIAL TECHNOLOGIES	**YEAR: 1**	**TERM: 1**

WEEKLY PLANNING

WEEK	SESSION	GROUP	DESCRIPTION	TYPE			NOTES	HOURS	
				LECTURE	PROBLEMS	EXAM		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	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	Size	Content						Hours	Total
7	1	Large	● <u>**CHAPTER 3**</u>: **THE VECTOR SPACE** $\mathbb{K}^n$ · Coordinate Systems · Introduction to Linear Transformations	X					1.66	7
	2	Small	● <u>**CHAPTER 3**</u>: **THE VECTOR SPACE** $\mathbb{K}^n$ **Problems**		X				1.66	
8	1	Large	● <u>**CHAPTER 4**</u>: **MATRIX ALGEBRA** · 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	X			1.66	
9	1	Large	● <u>**CHAPTER 4**</u>: **MATRIX ALGEBRA** · 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**</u>: **EIGENVALUES & EIGENVECTORS** · 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**</u>: **EIGENVALUES & EIGENVECTORS** · 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**</u>: **ORTHOGONALITY** · Dot Product and Modulus · Orthogonal Sets · Unitary Matrices	X				New Chapter!	1.66	7
	2	Small	**PROBLEMS (To be determined)**		X	X			1.66	
13	1	Large	● <u>**CHAPTER 6**</u>: **ORTHOGONALITY** · 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**</u>: **ORTHOGONALITY** · Least-Squares Problems ● <u>**CHAPTER 7**</u>: **NORMAL MATRICES** · 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**