



SUBJECT: Rotating electrical machines		
GRADE: Tecnologías Industriales	YEAR: 4th	TERM: 1st

WEEKLY SCHEDULE OF THE SUBJECT									
Week	Session	SESSION CONTENT DESCRIPTION	GRUPO (marcar X)		Fechas de entrega de ejercicios de evaluación	Indicar SI/NO ¿sesión con 2 profs?	STUDENT WEEKLY WORKLOAD		
			G	P			DESCRIPTION	IN-CLASS HOURS.	Homework (Max. 7h/sem)
1	1	Course presentation. Subject content and structure. Evaluation rules Types of electric machines: DC, CA, others. Basic description of an electrical machine. Building aspects of electrical machines.	X			NO	Searching, gathering and selecting of information retrieved on the web.	1,66	3,33
1	2	The electric drives issue. The torque equation. Types of load torques. Speed-torque curve. Examples. Inertia moment, ideal and non ideal gears. Calculation of electrical and mechanical power with different types of loads.		X		NO	Searching, information on mechanical systems: Numerical specifications.	1,66	
2	3	Practical and technological aspects of electric machines. Standardisation: Mounting arrangements. Enclosure protection codes. Cooling codes. Thermal classification of insulating materials. Thermal ageing of insulating materials.	X			NO	Searching, information on technological aspects and standardisation of rotating electrical machines. Homework T1: Define numerically a freely chosen drive specification	1,66	5
2	4	Practical demonstration on a test bench. Types of excitation for DC machines. Operation of DC machines. Equivalent circuit. No-load curve.		X		NO	Searching, information on technological aspects and standardisation of rotating electrical machines.	1,66	
3	5	Description and practical aspects of an induction machine. Power balance. Operation of a DC machine.	X			NO	Design and preparation of a test protocol for losses separation and efficiency measurement on the test bench.	1,66	5
3	6	External voltage-current characteristic. Torque- and internal emf production. Motor operation of a DC machine		X		NO		1,66	
4	7	Design of an experimental procedure for the losses separation and efficiency evaluation of the two-machine test bench	X			NO	Homework T2: Excel spreadsheet for losses separation and efficiency measurement.	1,66	5
4	8	Direct measurement of losses and efficiency. External mechanical torque-speed characteristic.		X	HMT2	NO	Determination of the dynamic model parameters from direct measurements.	1,66	

5	9	External mechanical torque-speed characteristic. Speed regulation of a DC machine. Speed regulation of an AC machine	X			NO	Preparation of the HMT1 presentations	1,66	5
5	10	Introduction to Matlab-Simulink		X		NO	Reading Matlab-Simulink Tutorial	1,66	
6	11	Working of In-class presentations.	X			NO	Preparation of the HMT1 presentations	1,66	5
6	12	In-class presentations of Homework T1		X	HM T1	NO	Preparation of the HMT1 presentations	1,66	
7	13	In-class presentations of Homework T1	X			NO	Homework T3: Critical analysis and report on HMT1 other's classmates presentations	1,66	5
7	14	Electrical machines simulation with Matlab-Simulink		X	HMT3	NO		1,66	
8	15	Basic operation of the induction motor	X			NO		1,66	5
8	16	Operation analysis of AC induction motors. Explanation of rated plate data. Selection of an induction motor for a given application		X		NO	Homework T4: Design and motor selection for a constant-frequency drive	1,66	
9	17	Operation analysis of AC induction motors. Base case: constant frequency. Influence of the type of service and service factor on the sizing process.	X			NO	Work on constant-frequency drive sizing.	1,66	5
9	18	DC machines simulation with Matlab-Simulink		X		NO	HOMEWORK T5: SIMULINK simulation report	1,66	
10	19	Working on the selection of an induction motor for a given application. Base case: constant frequency.	X		HM T4	NO	Preparation of the HMT4 presentations	1,66	5
10	20	Selection of an induction motor for a given application. Presentations of the selected cases (I)		X		NO	Preparation of the HMT4 presentations.	1,66	
11	21	Selection of an induction motor for a given application. Presentations of the selected cases (II)	X		HM T5	NO	Preparation of the HMT4 presentations. Homework T6: Critical analysis and report on HMT4 other's classmates presentations	1,66	5
11	22	Variable-frequency induction motor drives. PWM problems, overvoltages, pulse propagation, bearing fluting.		X	HMT6	NO	Reading recommended documents	1,66	
12	23	Operation analysis of AC induction motors. Variable frequency (Theory). Presentation of homework cases.	X			NO	Homework T7: Design and motor selection for a variable-frequency drive	1,66	5
12	24	Operation analysis of AC induction motors. Variable frequency (I)		X		NO	Work on variable-frequency drive sizing	1,66	
13	25	Operation analysis of AC induction motors. Variable frequency (II)	X		HM T7	NO	Work on variable-frequency drive sizing	1,66	5
13	26	Working on the selection of an induction motor for a variable frequency application.		X		NO	Work on variable-frequency drive sizing	1,66	
14	27	Working on the selection of an induction motor for a variable frequency application. (In-class presentations)	X			NO	Homework T8: Critical analysis and report on HMT4 other's classmates presentations	1,66	5
	28	Working on the selection of an induction motor for a variable frequency application. (In-class presentations)				NO		1,66	
		Tutorials, homework delivering, etc			HM T8	NO		1,66	1,66
								48,33	

		Total 1 (In-class and homework hours load during 1-14th weeks)				118,33	
						8,67	
						3	20
						Subtotal 2	
						3	
		Total 2 (In-class and homework hours load during 15-18th weeks)				31,67	
		TOTAL (Total 1 + Total 2. Maximum 180 horas)				150	