Universidad Carlos III de Madrid
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COURSE: Electricity markets		
DEGREE: Electrical Engineering	**YEAR: 2015-16**	**TERM: 1**

La asignatura tiene 29 sesiones que se distribuyen a lo largo de 14 semanas. Los laboratorios pueden situarse en cualquiera de ellas. Semanalmente el alumnos tendrá dos sesiones, excepto en un caso que serán tres

WEEKLY PLANNING

WEEK	SESSION	DESCRIPTION	GROUPS (mark X)		SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)	Indicate YES/NO If the session needs 2 teachers	WEEKLY PROGRAMMING FOR STUDENT		
			LECTURES	SEMINARS			DESCRIPTION	CLASS HOURS	HOMEWO HOUR (Max. 7 week)
1	1	Introduction. Primary, secondary and tertiary regulation (not dynamic).	X			NO	Attendance. Study of the proposed topics	1,66	5,5
1	2	Problems of regulation and Area Control Error		X		NO	Attendance. Study of the proposed topics	1,66	
2	3	Voltage regulation. Voltage stability.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	5,5
2	4	Problems of voltage regulation (1)		X		NO	Attendance. Study of the proposed topics	1,66	
3	5	Voltage Regulation: compensating devices	X			NO	Rating. Attendance.	1,66	5,5

							Study of the proposed topics		
3	6	Problems of voltage regulation (2)		X		NO	Attendance. Study of the proposed topics	1,66	
4	7	Costs of ppower plants. Fundamentals of optimization.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	5,5
4	8	Laboratory 1. Introduction to PSS/E		X	Computer room.	NO		1,66	
5	9	Optimization with equality and inequality constraints. Economic dispatch with and without and losses.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	5,5
5	10	Laboratory 2. Voltage regulation.		X	Computer room.			1,66	
6	11	Optimal power flow.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	7
6	12	Optimal power flow. Examples.		X		NO	Attendance. Study of the proposed topics	1,66	
7	13	Unit commitment. Hydro generation. Pumping stations.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	7
7	14	Unit commitment. Hydro generation. Pumping stations. Problems		X		NO	Attendance. Study of the proposed topics	1,66	
8	15	Wholesale and retail electricity markets. Power exchanges. The Iberian market.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	7
8	16	Problems of electricity markets and power pools. Problem 1. Access tariffs from consumers.		X		NO	Attendance. Study of the proposed topics	1,66	
9	17	Congestion mangement: nodal pricing and redispatching.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	7
9	18	Redispatching congestion management. Zonal prices.		X		NO	Attendance. Study of the proposed topics	1,66	
10	19	Ancillary services. Imbalances. Different market models.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	7
10	20	Imbalances. Problem 2. Revenues of a wind farm.		X		NO	Attendance. Study of the proposed topics	1,66	

11	21	Participation of thermal and hydro power plants in electricity markets. Pumping plants.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	7
11	22	Problems of participation of thermal and hydro power plants in perfectly competitive markets and oligopolies.		X		NO	Attendance. Study of the proposed topics	1,66	
12	23	Power grids as natural monopolies. Revenues and fees. Other aspects (losses, connection charges). Power quality.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	7
12	24	Problems of investment in transmission. Losses and power quality.		X		NO	Attendance. Study of the proposed topics	1,66	
13	25	Power system planning. Introduction, generation planning. Optimal generation portfolio.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	7
13	26	Laboratory 3. Economic dispatch and OPF		X	Computer room.	NO		1,66	
14	27	Capacity payment. Definition and regulation in Spain.	X			NO	Rating. Attendance. Study of the proposed topics	1,66	7
14	28	Problems of long term market equilibrium.		X		NO	Attendance. Study of the proposed topics	1,66	
	29	Laboratory 4. Final exam		X	Computer room.			1,66	5
							Subtotal 1	**48,33**	**95,5**
							Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	143,64	

15		Tutorials, handing in, etc						17,36	
16		Assessment						3	16
17									
18									
							Subtotal 2	**3**	**16**
							Total 2 *(Hours of class plus student homework hours between weeks 15-18)*	36,36	

TOTAL *(Total 1 + Total 2. Maximum 180 hours)*	**180**