



SUBJECT NAME: MATERIALS PERFORMANCE IN EXTREME CONDITIONS

POSTGRADE: UNIVERSITY MASTER IN MATERIALS SCIENCE AND ENGINEERING
Professors: María Asunción Bautista, Sophia Tsipas y Juan Cornide

ECTS: 3

FOUR -MONTH PERIOD: 2

TIMETABLE OF THE COURSE (detailed version)

WEEK	SESION	DESCRIPTION OF THE CONTENT OF THE SESSION	GRUOP (tick X)		Indicate different classroom space required (computer classroom, audiovisual, etc...)	TRABAJO DEL ALUMNO DURANTE LA SEMANA		
			1	2		DESCRIPCION	ATTENDANCE HOURS	HOURS OF INDIVIDUAL WORK (maximum 7 h)
1	1	Presentation of the subject. 1. Challenges of material in the industry. 2. Aqueous corrosion and the factors that determine the anode location. Corrosion under thermal isolation.	X			Study of the contents taught during the lesson.	1.5	1.5
1	2	Laboratory 1: Manufacturing of different corrosion cells. Preferential location of anodes and cathodes.	X		1.0A04	Reading the guide notes for the experimental work and solving the raised questions in small groups	1.5	1.5
2	3	Laboratory 2: Analysis of the results of the former laboratory session. Influence of acid concentration in passivable systems. Measurement of the intensity of galvanic couples.	X		1.0A04	Reading the guide notes for the experimental work and solving the raised questions in small groups.	1.5	4
2	4	3. High temperature oxidation of materials.	X			Study of the contents taught during the lesson.	1.5	2
3	5	4. Extreme wear conditions 5. Tribocorrosion.	X			Study of the contents taught during the lesson. Doing the first individual exercise of the continuous assessment	1.5	2



3	6	Laboratory 3: Hot corrosion. Wear Test	X		1.0A03	Reading the guide notes for the experimental work and solving the raised questions in small groups	1.5	1.5
4	7	6. Stress corrosion cracking 7. Deterioration of the mechanical properties in extreme conditions.	X			Study of the contents taught during the lesson. Doing the second individual exercise of the continuous assessment	1.5	2
4	8	Laboratory 4: Analysis of the results of the former laboratory session	X		1.0A03	Reading the guide notes for the experimental work and solving the raised questions in small groups	1.5	4
5	9	8. H embrittlement. 9. Challenges of joining of components in the industry. 10. Corrosion inhibitors.	X			Study of the contents taught during the lesson.	1.5	2
5	10	10. Cathodic protection. Anodic protection. 11 Materials performance in the chemical industry.	X			Study of the contents taught during the lesson. Doing the third individual exercise of the continuous assessment	1.5	3
6	11	12. Materials performance in the petrol industry.	X			Study of the contents taught during the lesson.	1.5	2
6	12	12. Materials performance in the petrochemical industry. 13. Materials performance in thermal fuel plants.	X			Study of the contents taught during the lesson. Doing the fourth individual exercise of the continuous assessment.	1.5	2.5
7	13	14. Materials performance in the paper industry. 15. Materials performance in nuclear power generation plants. Effect of irradiation on materials	X			Study of the contents taught during the lesson.	1.5	2
7	14	16. Materials performance in solar power stations Materials performance in aerospace and aeronautical industries.	X			Study of the contents taught during the lesson.	1.5	2
TOTAL HOURS							21	33.5