



COURSE: Chemical Basis of the Engineering

GRADE: ENERGY ENGINEERING

YEAR: 1

TERM: 1

WEEKLY PLANNING

WEEK	SESSION	DESCRIPTION	TEACHING (mark X)		SPECIAL ROOM FOR SESSION (Computer classroom, audio-visual class room)	Indicate YES/NO if this is a sesión with two teachers	WEEKLY PROGRAMMING FOR STUDENT		
			LECTURES	SEMINARS			DESCRIPTION	CLASS HOURS (1,66=50+50 min)	HOMEWORK HOURS (Max. Estim. 6,5h)
1	1	BLOCK 1: FUNDAMENTALS Structure of matter. Atomic structure. Electronic configuration and periodic properties..	X			NO	Work on the topic taught, including recommended readings	1,66	6
1	2	Review of fundamental concepts: atom, atomic mass and isotopic distribution. Ions. Mol. Solutions. Stoichiometry.		X		NO	Work on proposed exercises	1,66	
2	3	Chemical bond. Link types. Interactions intermolecular. Examples of obtaining the shape and geometry of simple molecules.	X			NO	Work on the topic taught, including recommended readings	1,66	6
2	4	Solving exercises and questions related to fundamental aspects of block 1		X		NO	Work on proposed exercises	1,66	
3	5	States of matter. Gases, solids and liquids	X			NO	Work on the topic taught, including recommended readings	1,66	6
3	6	Solving exercises and questions related to fundamental aspects of block 1		X		NO	Work on proposed exercises	1,66	
4	7	Solutions and colligative properties	X			NO	Work on the topic taught, including recommended readings	1,66	6

4	8	Solving exercises and questions related to fundamental aspects of block 1		X		NO	Work on proposed exercises	1,66	
5	9	BLOCK 2: THERMODYNAMICS AND CHEMICAL EQUILIBRIUM Thermochemistry. Enthalpy and heat capacity. Hess's law. Entropy.	X			NO	Work on the topic taught, including recommended readings	1,66	6
5	10	Solving exercises and questions related to fundamental aspects of block 2		X		NO	Work on proposed exercises	1,66	
6	11	Free energy. Chemical equilibrium. Equilibrium constant. Factors affecting the chemical equilibrium Le Chatelier's principle.	X			NO	Work on the topic taught, including recommended readings	1,66	6
6	12	Solving exercises and questions related to fundamental aspects of block 2		X		NO	Work on proposed exercises	1,66	
7	13	Acid-base and solubility. Acid-base equilibrium. pH. Acid and basic ionization constant. Neutralization.	X			NO	Work on the topic taught, including recommended readings	1,66	6,5
7	14	Laboratory session. Titration of a polyprotic acid			1.1E02	SI	Lab practices in groups of 2-3 students and delivery report.	2	
8	15	Buffer solutions. pH Indicators. Solubility product. Factors affecting solubility.	X			NO	Work on the topic taught, including recommended readings	1,66	6
8	16	Solving exercises and questions related to fundamental aspects of block 2		X		NO	Work on proposed exercises	1,66	
9	17	Electrochemistry. Oxidation-reduction reactions. Standard potentials. Operation of galvanic cells.	X			NO	Work on the topic taught, including recommended readings	1,66	6,5
9	18	Laboratory session. Measuring electrochemical potentials			1.1E02	SI	Lab practices in groups of 2-3 students and delivery report.	2	
10	19	Electrolytic cells. Faraday's law. Applications. Nernst equation. Corrosion.	X			NO	Work on the topic taught, including recommended readings	1,66	6
10	20	Solving exercises and questions related to fundamental aspects of block 2		X		NO	Work on proposed exercises	1,66	
11	21	SECTION 3: APPLIED CHEMISTRY Chemistry kinetics and catalysis. Reaction rate. Rate law and order of reaction. Arrhenius' law. Catalysis.	X			NO	Work on the topic taught, including recommended readings	1,66	6
11	22	Solving exercises and questions related to fundamental aspects of block 3		X		NO	Work on proposed exercises	1,66	
12	23	Basic operations in chemical engineering. Concept of basic operation. Basic operations controlled by mass or mass/heat transport.	X			NO	Work on the topic taught, including recommended readings	1,66	6,5
12	24	Laboratory session. Separation of a mixture			1.1E02	SI	Lab practices in groups of 2-3 students and delivery report.	2	
13	25	Organic Chemistry (I). Organic compounds. Classification. Main types of organic reactions. Physical and chemical properties of parafines and	X			NO	Work on the topic taught, including recommended readings	1,66	6

		olefines. Hydrocarbons. Combustion.							
13	26	Estudio de procesos industriales de la química inorgánica: síntesis de amoníaco, ácido sulfúrico, carbonato sódico...		X		NO	Work on proposed exercises. Case studies	1,66	
14	27	Organic Chemistry (II). Physical and chemical properties of another organic compounds. Reactivity and examples of industrial processes	X			NO	Work on the topic taught, including recommended readings	1,66	6
14	28	Fractionation and industrial use of oil, coke ... Exercises of combustion		X		NO	Work on proposed exercises. Case studies	1,66	
	29	Laboratory session. Reaction kinetics. Method of initial rates			1.1E02	SI	Lab practices in groups of 2-3 students and delivery report.	2	2,5
Subtotal 1								41,7 + 8 lab	88
Total 1 (Hours of class plus student homework)								137,7	
15	Tutorials, handing in, etc							4	
16-18	Assessment							3	15
Subtotal 2								7	15
Total 2 (Hours of class plus student homework)								22	
TOTAL (Total 1 + Total 2. Maximum 160 hours)								159,7	