Universidad Carlos III de Madrid

COURSE: Physics II		
DEGREE: Bachelor's Degree in Industrial Electronics and Automation	COURSE: 1º	TERM: 2º

WEEKLY PLANNING

WEEK	SESSION	DESCRIPTION	GROUPS (mark X)		Indicate YES/NO If the session needs 2 teachers		WEEKLY PROGRAMMING FOR STUDENT		
1	1	**1. Coulomb's Law. The Electric Field** 1.1 Electric charge. 1.2 Coulomb's Law. Dimensions and Units. The Superposition Principle. 1.3 Definition of the Electric Field. 1.4 Electric Field of Point Charges. 1.5 Superposition Principle. Electric Field Lines.	X			No	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
1	2			X		No	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	
2	3	**2 Gauss's Law** 2.1 Charge Densities. Electric Field due to different Charge Distributions. 2.2 Electric Flux. Relationship between field flux and electromagnetic fields. 2.3 Gauss's Law.	X			No	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
2	4			X		No	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	

		2.4 Application of Gauss's Law to Calculate Electric Fields in systems with certain symmetry.								
3	5	**3 The Electric Potential** 3.1 The work done by an electric field on a moving point charge. 3.2 Electric Potential Difference and Electric Potential. 3.3 Electric Potential due to different Charge Distributions. 3.4 Relationship between Electric Field and Electric Potential. Equipotential curves and surfaces. 3.5 Electrostatic Energy of Point Charges.	**X**			**No**	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
3	6			**X**		**No**	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	
4	7	**4 Conductors** 4.1 Conductor and Insulator materials; microscopic interpretation. 4.2 Properties of conductors in Electrostatic Equilibrium. Charge Distribution in Conductors. 4.3 Electric Field and Electric Potential in a conductor. 4.4 Electric Fields inside charged conductors. Conductors with charge inside a cavity. The Faraday-s Cage. Corona Discharge.	**X**			**No**	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
4	8			**X**		**No**	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	

5	9	**5 Dielectrics: Capacitance and Energy Storage** 5.1 Microscopic point of view of dielectrics: induced dipoles. 5.2 Dielectric constant and electric susceptibility. Polarization. Electric displacement. 5.3 Definition of Capacitance: Calculation of capacitance. 5.4 Capacitors with Dielectrics. 5.5 Combination of Capacitors. Series and parallel connections. 5.6 Storing energy in a Capacitor. Energy density of the electric Field.	**X**			**No**	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
5	10			**X**		**No**	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	
6	11	**6 Electric Current** 6.1 Electric Current: Intensity and Current Density. 6.2 Ohm's Law. Electric Resistance. Conductivity and resistivity of materials. 6.3 Joule-s Law. Power Dissipated in an Electric Conductor. 6.4 Electromotive Force (emf). Combination of resistance. Series and parallel connections. 6.4 RC circuits. Charging and discharging a capacitor.	**X**			**No**	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
6	12			**X**		**No**	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	
7	13	**7 Magnetic Forces and Magnetic Fields** 7.1 Introduction. Definition of a Magnetic Field. Lorentz-s Force. 7.2 Charged Particle Movement in a uniform Magnetic Field. Applications: Velocity selector, Mass Spectrometer. 7.3 Magnetic Force on a dipole and on a Current-Carrying conductor wire. 7.4 Torque on a dipole and Current Loop in a constant magnetic field, Permanent Magnets. Magnetic Moment.	**X**			**No**	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
7	14			**X**		**No**	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	

8	15	**8 Sources of Magnetic Field and Magnetic Fields in Matter** 8. Sources of Magnetic Field and Magnetic Materials. 8.1 Sources of the Magnetic Field: Current elements. Biot-Savart Law. 8.2 Forces Between Two Current-Carrying parallel wires. 8.3 Magnetic Flux. Ampère-s Law. Application of Ampère-s Law to Calculate Magnetic Fields.	**X**			**No**	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
8	16			**X**		**No**	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	
9	17	**8.4 Magnetic Fields in Matter**. 8.4 Magnetic Materials. Microscopic point of view of Magnetism. Magnetization: Magnetic Dipoles. Paramagnetism, Diamagnetism and Ferromagnetism. Magnetic Susceptibility and Permeability.	**X**			**No**	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
9	18			**X**		**No**	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	
10	19	**9 Faraday's Law** 9.1 Faraday's Law of Induction. Lenz-s Law. Applications. 9.2 Motional Electromotive Force. 9.3 Examples of Electromagnetic Induction. 9.4 Mutual Induction and Self-Induction. Energy Stored in a Solenoid. 9.5 Energy Stored in a Magnetic Field.	**X**			**No**	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
10	20			**X**		**No**	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	
11	21	**10. Oscillations. Maxwell's Equations: Electromagnetic Waves** 10.1 Introduction to the oscillatory movement. Mathematical description of the oscillatory systems. 10.2 Simple AC circuits: resistive, inductive and capacitive load. The LCR series circuits. Impedance. Resonance. 10.3 Introduction to travelling Waves and Standing Waves: Mathematical Description. Mechanical waves, Sound and Electromagnetic Waves. One-dimensional wave Equation.	**X**			**No**	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
11	22			**X**		**No**	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	

12	23	**<u>10.4 Oscillations. Maxwell's Equations(2)</u>** **<u>Electromagnetic Waves:</u>** 10.4 Displacement Current: Gauss´s Law for Magnetism: Maxwell's Equations. Plane Electromagnetic Waves. Energy Flux Density of an Electromagnetic Wave.	**X**			**No**	Read the suggested topics. Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	6
12	24			**X**		**No**	Do the suggested exercises. Participate in the discussions. Expose the suggested works.	1,66	6
13	25	Revision and integration of the main concepts.	**X**			**No**	Read the suggested topics. Individual work on the concepts shown in course lectures. It includes the search of bibliography	1,66	4
¿?	26	**Laboratory practice 1**		**X**	Laboratory	**No**	Read and study the suggested topics. Laboratory work. Elaborate a report. Compulsory activity.	1,66	3
¿?	27	**Laboratory practice 2**		**X**	Laboratory	**No**	Read and study the suggested topics. Laboratory work. Elaborate a report. Compulsory activity.	1,66	3
¿?	28	**Laboratory practice 3**		**X**	Laboratory	**No**	Read and study the suggested topics. Laboratory work. Elaborate a report. Compulsory activity.	1,66	3
¿?	29	**Laboratory practice 4**		**X**	Laboratory	**No**	Read and study the suggested topics. Laboratory work. Elaborate a report. Compulsory activity.	1,66	3
SUBTOTAL								**48,33 + 94 = 136,33**	
		Tutorials, handing in, etc					Tutorials, handing in, etc	1,66	0
		Assessment						0	12
TOTAL								**150**	