Universidad Carlos III de Madrid
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COURSE: Physics		
DEGREE: Communication system Engineering, Audovisual system Engineering, Telematics Engineering and Telecommunication techniques Engineering	YEAR: 2013	TERM: 1st

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 online	SEMINARS face to face			DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
1	1	**1. Particle kinematics** -Position, velocity and acceleration vectors -Trajectory equation -Intrinsic components of the acceleration -Circular motion	X				-Read the suggested topics -Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	5
1	2			X			- Do the suggested exercises. - Participate in the discussions. - Expose the suggested works.	1,66	
2	3	**2.Particle dynamics** -Fundamental concepts: mass, linear momentum and forcé	X				-Read the suggested topics -Individual work on the concepts shown in the	1,66	5

		-Newton's Law -Forces examples: weight, elastic force -Work, Power, Kinetic energy -Conservative forces and potential energy -Angular moment and torque -Conservative theorems					lectures. It includes the search of bibliography		
2	4			X			- Do the suggested exercises. - Participate in the discussions. - Expose the suggested works.	1,66	
3	5	**3.Coulomb's law. Electric field** -Electric charge -Coulomb's law. Unit systems. Superposition principle -The electric field. Concept. Electric field intensity vector. -Electric field due to a punctual charge. Electric field lines	X				-Read the suggested topics -Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	5
3	6			X			- Do the suggested exercises. - Participate in the discussions. - Expose the suggested works.	1,66	
4	7	**4.Gauss's Law** -Continuous charge distributions: charge density. Electric field -Electric flux -Gauss's law -Application of Gauss's law to electric field calculations	X				-Read the suggested topics -Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	5
4	8			X			- Do the suggested exercises. - Participate in the discussions. - Expose the suggested works.	1,66	
5	9	**5.Electric potential**	X				-Read the suggested topics	1,66	5

		-Work done for moving a charge in an electric field -Potential difference. Electric potential -Potentials due to various charge distributions -Relationship between electric potential and the electric field. Equipotential surfaces -Electrostatic potential energy of a charge in an electric field. Conservation of energy					-Individual work on the concepts shown in the lectures. It includes the search of bibliography		
5	10			X			- Do the suggested exercises. - Participate in the discussions. - Expose the suggested works.	1,66	
6	11	**6.Conductors** -Conductors and insulators. Conductors in electrostatic equilibrium -Properties of conductors in electrostatic equilibrium: Field and potential inside. Charge distribution. Field and potential on the surface -Conductors with a cavity. Electrostatic shielding	X				-Read the suggested topics -Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	5
6	12			X			- Do the suggested exercises. - Participate in the discussions. - Expose the suggested works.	1,66	
7	13	**7.Capacitors, dielectrics and energy** -Definition of capacitor -Capacitor capacitance. Capacitances calculation -Combinations of capacitors -Energy stored in a capacitor -Capacitors with dielectrics. Dielectric constant -Microscopic theory of dielectrics. Electric dipole. Polarization -Rupture electric field	X				-Read the suggested topics -Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	5
7	14			X			- Do the suggested exercises. - Participate in the discussions.	1,66	

							- Expose the suggested works.		
8	15	**8.Electric Current** - Electric current. Intensity and density of current - Ohm'slaw. Resistance. Electric conductivity -Power dissipated by a conductor. Joule's law - Electromotive forcé	X				-Read the suggested topics -Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	5
8	16			X			- Do the suggested exercises. - Participate in the discussions. - Expose the suggested works.	1,66	
9	17	**9.Magnetic forces and magnetic fields** -Introduction -Definition of magnetic field. Lorentz's forcé on a charged particle -Motion of a charged particle on a magnetic field. Applications -Current element. Magnetic force on currents. Torques on circular loops and magnets	X				-Read the suggested topics -Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	5
9	18			X			- Do the suggested exercises. - Participate in the discussions. - Expose the suggested works.	1,66	
10	19	**10.Sources of the magnetic field I** -Electric currents as sources of the magnetic field. The Biot-Savart law -Magnetic flux -Ampere's law	X				-Read the suggested topics -Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	5
10	20			X			- Do the suggested exercises. - Participate in the discussions. - Expose the suggested works.	1,66	
11	21	**11.Sources of the magnetic field II** -Magnetic field due to simple distributions of	X				-Read the suggested topics -Individual work on the	1,66	5

		electric currents -The magnetic force between currents. Case of two parallel conductor wires. -Atomic magnetic moments. Magnetization -Magnetism in matter					concepts shown in the lectures. It includes the search of bibliography		
11	22			X			- Do the suggested exercises. - Participate in the discussions. - Expose the suggested works.	1,66	
12	23	**12.Faraday's law of induction** -Faraday's law of induction. Lenz's law -Examples: motional electromotive force and electromotive force due to a time –varying magnetic field -Self-inductance. Energy in a magnetic field	X				-Read the suggested topics -Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	5
12	24			X			- Do the suggested exercises. - Participate in the discussions. - Expose the suggested works.	1,66	
13	25	**13.Wave motion** -Oscillators. Simple harmonic oscillator. Energy of a simple harmonic oscillator. Examples -Wave motion. Types of waves. Mechanical eaves -Mathemathical description of waves: wave function. Wave propagation speed -Wave equation -Harmonic waves. Standing waves **14.Sound and electromagnetic waves** -Pressure waves: sound waves. Doppler effect -Electromagnetic waves. Electromagnetic spectrum.	X				-Read the suggested topics -Individual work on the concepts shown in the lectures. It includes the search of bibliography	1,66	5 3
13	26	Laboratory practice 1			ONLINE		-Read the suggested topics -Pick data in the laboratory -Elaborate a report	1,66	

14	27	Laboratory practice 2			Laboratory		-Read the suggested topics -Pick data in the laboratory -Elaborate a report	1,66	3
14	28	Laboratory practice 3			ONLINE		-Read the suggested topics -Pick data in the laboratory -Elaborate a report	1,66	3
	29	Laboratory practice 4			Laboratory		-Read the suggested topics -Pick data in the laboratory -Elaborate a report	1,66	5,67
							Subtotal 1	**48,33**	**79,67**
							Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	**128**	

15		Tutorials, handing in, etc						2	2
16		Assessment						3	**15**
17									
18									
								5	**17,00**
							Total 2 *(Hours of class plus student homework hours between weeks 15-18)*	**22**	

TOTAL *(Total 1 + Total 2. Maximum 180 hours)*	**150**