



COURSE: PHYSICS I		
DEGREE: ENERGY ENGINEERING	YEAR: 1st	TERM: 1st

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	HOMEWORK HOURS (Max. 7h week)
1	1	1. Kinematics of a particle I - Vectors position, velocity and acceleration - Equation of trajectory	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
1	2			X			- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
2	3	2. Kinematics of a particle II - Intrinsic components of acceleration. Circular motion - Transformations among systems of reference - Relative motion	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
2	4			X			- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
3	5	3. Dynamics of a particle I - Fundamental concepts: mass, linear momentum and forces - Newton's laws. Equations of motion. - Examples of forces: weight, elastic force, tension, contact forces.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5

3	6			X			- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
4	7	4. Dynamics of a particle II - Forces in linear accelerated systems and circular motion. - Angular moment and moment of forces	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
4	8			X			- Solve the proposed exercises. - Participation in discussions and activities. - Midterm Exam (*)	1,7	
5	9	5. Work and Energy - Work. Power. Kinetic energy. - Conservative forces and potential energy. - Non-conservative forces.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
5	10			X			- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
6	11	6. Systems of particles - Internal and external forces. - Center of mass. - Kinetic energy of a system of particles. - Conservation theorems for a system of particles. - Collisions.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
6	12			X			- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
7	13	7. Planar kinematics of the rigid body - Rotation and translation motion. - Motion of the rigid body in the plane. - Moment of inertia. - Theorem of Steiner.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc) - Midterm Exam (*)	1,7	5
7	14			X			- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
8	15	8. Dynamics of the Rigid Body - Equations of motion of the rigid body - Rotation work and power. - Kinetic energy of rotation.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
8	16			X			- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
9	17	9. Introduction to Thermodynamics. Temperature - Thermodynamics: concepts and definitions. - Pressure.	X				- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture	1,7	5

		- Definition of temperature. Zeroth Law. - The Ideal-Gas Law.				(i.e. searching additional information, etc)		
9	18			X		- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
10	19	10. Thermal properties of pure substances. Heat. - Thermal coefficients: expansion and isotherm compressibility. - Heat. Heat capacities and specific heats. - Phase Diagrams. Phase Changes. Latent Heat.	X			- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
10	20			X		- Solve the proposed exercises. - Participation in discussions and activities. - Midterm Exam (*)	1,7	
11	21	11. First principle - Experiment of Joule and statement of Helmholtz. -The first law applied to various processes. - Heat capacities of ideal gases.	X			- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
11	22			X		- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
12	23	12. Second principle - Statement of Kelvin-Planck. Heat engines. - Statement of Clausius. Refrigerators and heat pumps. - Irreversibility. - Cycle of Carnot. - Cycles with ideal gases.	X			- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
12	24			X		- Solve the proposed exercises. - Participation in discussions and activities.	1,7	
13	25	13. Entropy - Theorem of Clausius. Entropy - Diagrams T-S. Entropy in ideal gases. - Entropy in irreversible processes. Entropy balance.	X			- Reading of the corresponding chapters in the proposed literature. - Study and personal work on the lecture (i.e. searching additional information, etc)	1,7	5
n.a.	26	Lab session 1(**)			4.SB01- 4.SB02- 4.SB03	- Reading of the guideline document. - Data acquisition. - Analysis of results and report.	1,7	3
n.a.	27	Lab session 2(**)			4.SB01- 4.SB02- 4.SB03	- Reading of the guideline document. - Data acquisition - Analysis of results and report.	1,7	3
n.a.	28	Lab session 3(**)			4.SB01- 4.SB02- 4.SB03	- Reading of the guideline document. - Data acquisition - Analysis of results and report.	1,7	3

n.a.	29	Lab session 4(**)			4.SB01- 4.SB02- 4.SB03		- Reading of the guideline document. - Data acquisition - Analysis of results and report.	1,7	3
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(*) Exact midterm exams dates will be set at the beginning of the course.

(**) Dates of laboratory sessions are not yet available.

Subtotal 1								49,3	77
Total 1 (Hours of class plus student homework hours between weeks 1-14)								126,3	

15		Last Midterm Exam (*), Tutorials, handing in, etc.						2	2,7
16-18		Assessment						3	17

Subtotal 2								5	19,7
Total 2 (Hours of class plus student homework hours between weeks 15-18)								24,7	

TOTAL (Total 1 + Total 2. Maximum 180 hours)								151	
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