

COURSE: Energy in Transport		
DEGREE: Energy Engineering	YEAR: 4	TERM: 2nd

WEEKLY PLANNING								
WEEK	SESSION	DESCRIPTION	TEACHING (mark X)		SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)	WEEKLY PROGRAMMING FOR STUDENT		
			L E C T U R E S	S E M I N A R S		DESCRIPTION	CLASS HOURS (1,66=50+50 min)	HOMEWORK HOURS (Max. Estim. 3,25h)
1	1	1. Introduction. Energy consumption per sectors. Transport sector. Propulsion engines types per sector. Fuel types. Pollutants directly or indirectly emitted by transport systems.	x			Class attendance. Studying of the course materials.	1.66	3
2	2	2. Reciprocating engines in transportation. Architecture and processes of reciprocating engines. Solution of example problems.	x			Class attendance. Studying of the course materials.	1.66	3
3	3	2. Reciprocating engines in transportation (continuation). Power, torque and specific consumption in reciprocating engines.	x			Class attendance. Studying of the course materials.	1.66	3.25
4	4	2. Reciprocating engines in transportation (continuation). Processes and operation curves of reciprocating engines at full load. Solution of example problems.	x			Class attendance. Studying of the course materials.	1.66	3.25
5	5	2. Reciprocating engines in transportation (continuation). Combustion and pollution in reciprocating engines. Control and mitigation of pollution.	x			Class attendance. Studying of the course materials.	1.66	3.25

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6	6	FIRST LABORATORY SESSION: Indicated cycle of a reciprocating engine.	x		Computer room	Session attendance. Preparation and writing of the laboratory report.	1.66	3.25
7	7	MID TERM EXAM	x			Studying of the course materials. Class attendance. Answering of the exam questions.	1.66	3.25
8	8	3. Gas turbines in transportation. Gas turbine subsystems and processes. Brayton cycles for power generation and propulsion. Turbojet cycle without and with afterburner.	x			Class attendance. Studying of the course materials.	1.66	3.25
9	9	3. Gas turbines in transportation (continuation) Turbofan cycles. Combustion and pollution in gas turbines. Solution of example problems.	x			Class attendance. Studying of the course materials.	1.66	3.25
10	10	4. Electric propulsion in transportation. All-electric and hybrid systems. Energy storage systems.	x			Class attendance. Studying of the course materials.	1.66	3.25
11	11	5. Propulsion efficiencies. Resistance forces and propulsion power. Efficiencies of land, air and sea transport means. Solution of example problems.	x			Class attendance. Studying of the course materials.	1.66	3.25
12	12	6. Auxiliary devices in transportation systems. Cooling systems, HVAC, cabin pressurization, electrical and electronic systems, etcetera.	x			Class attendance. Studying of the course materials.	1.66	3.25
13	13	SECOND LABORATORY SESSION: Performance of a turbocharger of a reciprocating engine.	x		Computer room	Session attendance. Preparation and writing of the laboratory report.	1.66	3.25
14	14	7. Control and management of transportation systems. Transport control and management. Road, rail, air and maritime traffic. International transport modes.	x			Class attendance. Studying of the course materials.	1.66	3.25
	15	Additional session: rescheduled class in case a previous session is cancelled.				Class attendance. Studying of the course materials.	1.66	3.25
Subtotal 1							25	48

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15		Tutorials, handing in, etc					1.8	-
16		Assessment					4	4
17								
18								
Subtotal 2							6	4
Total 2 (Hours of class plus student homework)							10	

TOTAL (<i>Maximun 83 horas</i>)							83	
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