Universidad Carlos III de Madrid	COURSE: Propulsion Systems Performance and Design		
	MASTER: Aeronautical Engineering	YEAR: 1st	TERM: 2nd

WEEKLY PLANNING

SESSION	WEEK	DESCRIPTION	TYPE		COMMENTS	STUDENT WEEKLY PROGRAMME		
			LECTURE	SEMINAR		DESCRIPTION	CLASS HOURS	HOMEWORK HOURS
1	1	Review of engine requirements	X			Read the corresponding notes chapters Study and personal work	1,6	2
2	2	Preliminary design process: the constraint analysis • Theta break and throttle ratio • Models for thrust lapse and constraint estimation Non-standard atmosphere models	X			Read the corresponding notes chapters Study and personal work	1,6	3
3	2	Aircraft Propulsion: configurations and components		X	Room 3.1.S08 Seminar of Prof. F.Ehrich (MIT)	Read the corresponding notes chapters Study and personal work	1,6	2
4	3	LAB 1 - Selection of the powerplant		X	Computer room	Study and personal work Solve the proposed exercises	1,6	3
5	3	Preliminary design process: the mission analysis Parametric cycle analysis (1/4) • Nomenclature of characteristic ratios and efficiencies • Engine performance analysis: ideal and real turbojet	X			Read the corresponding notes chapters Study and personal work	1,6	2
6	4	Parametric cycle analysis (2/4) • Polytropic efficiencies of turbomachines • Calorically perfect gases and real gases • Engine performance analysis: mixed flow turbofan with bleeds and afterburning		X		Read the corresponding notes chapters Study and personal work	1,6	3
7	4	Parametric cycle analysis (3/4) • Mixer, afterburner and performances of a mixed flow turbofan with afterburner	X			Read the corresponding notes chapters Study and personal work	1,6	3

		• Mixed vs separate exhaust turbofan • Examples of parametric cycle analysis						
8	5	Parametric cycle analysis (4/4) • Perform parametric cycle analysis		X	Computer room	Study and personal work Solve the proposed exercises	1,6	2
9	5	LAB 1 PROOSIS – parametric cycle analysis		X	Computer room	Study and personal work Solve the proposed exercises	1,6	4
10	6	QUIZ 1 (50 minutes) Introduction to performance cycle analysis	X			Read the corresponding notes chapters Study and personal work	1,6	3
11	6	Sensors, instrumentation and control	X			Read the corresponding notes chapters Study and personal work	1,6	3
12	7	Off-design performances of turbojets	X			Read the corresponding notes chapters Study and personal work	1,6	4
13	7	Cycle analysis of turbofan engines		X	Computer room	Study and personal work Solve the proposed exercises	1,6	2
14	8	Off-design analysis in PROOSIS		X	Computer room	Study and personal work Solve the proposed exercises	1,6	3
15	8	LAB 2 PROOSIS – performance analysis		X	Computer room	Study and personal work Solve the proposed exercises	1,6	5
16	9	Bearing and seals	X			Read the corresponding notes chapters Study and personal work	1,6	2
17	9	Secondary systems: lubrication and cooling	X			Read the corresponding notes chapters Study and personal work	1,6	2
18	10	Installed performances	X			Read the corresponding notes chapters Study and personal work	1,6	3
19	10	Engine testing	X			Read the corresponding notes chapters Study and personal work	1,6	3

20	11	LAB 3 PROOSIS – Transient analysis		X	Computer room	Study and personal work Solve the proposed exercises	1,6	3
21	11	Certification. Problems on engine testing		X		Read the corresponding notes chapters Study and personal work Solve the proposed exercises	1,6	3
22	12	Turbine cooling design (1/2)	X			Read the corresponding notes chapters Study and personal work	1,6	3
23	12	Engine structural design	X			Read the corresponding notes chapters Study and personal work	1,6	3
24	13	Turbine cooling design (2/2)		X		Read the corresponding notes chapters Study and personal work Solve the proposed exercises	1,6	2
25	13	Problems on structural design		X		Study and personal work Solve the proposed exercises	1,6	2
26	14	Turbomachinery flutter	X			Read the corresponding notes chapters Study and personal work	1,6	3
27	14	Ramjets and scramjets	X			Read the corresponding notes chapters Study and personal work	1,6	2
28	15	Problems on turbomachinery flutter QUIZ 2 (50 minutes)		X		Study and personal work Solve the proposed exercises	1,6	3
						Subtotal 1	**48,33**	**78**

Sum *(Hours of class plus student homework hours between weeks 1-14)*	126.33

	15	Tutorials, handing in, etc						5
	16	Assessment					3	15
	17							
	18							
						Subtotal 2	**3**	**20**

Total *(Total 1 plus student homework hours between weeks 15-18)*	149.33