TURBO MACHINERY DESIGN PRINCIPLES

1	Course Title:	TURBO MACHINERY DESIGN PRINCIPLES
2	Course Code:	MAK 6210
3	Type of Course:	Optional
4	Level of Course:	Third Cycle
5	Year of Study:	1
6	Semester:	2
7	ECTS Credits Allocated:	6.50
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. MUHSIN KILIÇ
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	Prof. Dr. Muhsin Kılıç mkilic@uludag.edu.tr Adres: Uludağ Üniversitesi Mühendislik-Mimarlık Fakültesi Ali Durmaz Makine Mühendisliği Binası DM:220 16059 Görükle/BURSA Tel: 0224 294 1953
17	Website:	
18	Objective of the Course:	Mechanical engineering students with the gas and steam turbines, compressors, such as energy production, particularly the most widely used for various purposes, including the principles of thermal turbo machines, to teach the fundamentals of design and calculation methods in designing
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	
	1	Turbomachinery, general definitions, classifications, will be familiar with basic dimensions
	2	Thermal turbo machines, classes, and knows the area of use
	3	For subsonic and supersonic flows, like nozzle and diffuser design elements can made
	4	For radial-flow compressor calculation and design methods can be learnt
	5	For radial-flow turbine calculation and design methods can be learnt
	6	For Axial-flow compressor calculation and design methods can be learnt
	7	For Axial-flow turbine calculation and design methods can be learnt
	8	Have a basic knowledge on the use of thermal turbo machines at heat and power plants.
	9	
	10	

21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	Introduction of the course, given the content, giving students the resources and the measurement method. Turbo Machines Introduction, Dimensional Analysis, Similarity.	
2	Introduction of thermal turbo machines in the lab. Thermodynamics and Fluid Mechanics required for thermal turbo machines reminder of basics. I. Thermodynamics And II. Laws. Theorem of linear momentum, angular momentum theorem, the Euler equation	
3	that the flow nozzle and diffusers, stagnation properties, the speed of sound, subsonic and supersonic flow speeds. Convergent, convergent-divergent nozzle and diffusers. Nozzle and diffuser efficiencies. Actual nozzle and diffuser efficiencies. Problem solving and application.	
4	The compressor and turbine efficiencies. Problems solving	
5	Two-dimensional flow for kaskats. Concepts, force analysis, minor losses. Wing design	
6	Two-dimensional flow for kaskats. Concepts, force analysis, minor losses. Wing design. Example problems solving.	
9	Radial-flow compressor	
11	Axial-flow turbine	
13	Example problems solving about axial-flow	
14	Performance evaluation of thermic turbo-machinery design and the non-use of design	
22	Textbooks, References and/or Other Materials:	Turbomakinelerde Akış: Turbomakinelerin Termodinamiği ve Akışkanlar Mekaniği, F. Öztürk, Birsen Yayınevi, 1997 Örneklerle Termik Turbo Makinaların Prensipleri, N.
		Fluid Mechanics and Thermodynamics of Turbomachinery, 3rd Ed., S.L. Dixon , Pergoman Press Ltd., 1978, Oxford
23	Assesment	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	3.00	42.00
Homeworks	1	45.00	45.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	2.00	2.00
Others	1	62.00	62.00
Final Exams	1	2.00	2.00
Total Work Load			195.00
Total work load/ 30 hr			6.50
ECTS Credit of the Course			6.50

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	30.00
Quiz	0	0.00
Home work-project	1	20.00
Final Exam	1	50.00
Total	3	100.00

Contribution of Term (Year) Learning Activities to Success Grade	50.00
Contribution of Final Exam to Success Grade	50.00
Total	100.00
Measurement and Evaluation Techniques Used in the Course	

24 ECTS / WORK LOAD TABLE

25 CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS

	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	5	5	4	3	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	4	4	3	0	0	0	0	0	0	0	0	0	0	0	0	3
ÖK4	4	5	4	0	0	0	0	0	0	0	0	0	0	0	0	3
ÖK5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**