FUELS AND COMBUSTION

1	Course Title:	FUELS AND COMBUSTION
2	Course Code:	OTO3009
3	Type of Course:	Optional
4	Level of Course:	First Cycle
5	Year of Study:	4
6	Semester:	7
7	ECTS Credits Allocated:	4.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	-
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. ALİ SÜRMEN
15	Course Lecturers:	Prof.Dr. Atakan Avcı Doç.Dr. M.İhsan Karamangil
16	Contact information of the Course Coordinator:	2941954 / atakan@uludag.edu.tr 2941978 / ihsan@uludag.edu.tr
17	Website:	
18	Objective of the Course:	The aim of the course is to give basic knowledge about combustion and combustor systems
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	

	1	Skill of comprehending fuel properties, combustion phenomenon and combustor systems
	2	Skill of solving engineering problems related to combustion phenomenon
	3	Skill of using information technologies effectively
	4	Skill of analyzing and commenting combustion products
	5	Skill of gaining to conduct individual and team work
	6	Skill of gaining awareness of lifelong learning necessity
	7	
	8	
	9	
	10	

21 Course Content:

Course Content:

Week	Theoretical	Practice
1	Introduction to combustion technology Classification of the fuels	
2	Refinerization gas fuels, Classification of the hydrocarbons	

3	liquid fuels	
4	Combustion and combustion equations Ignition temperature, dew-point temperature and properties of the air	
5	Air/fuel ratio, combustion types (theoretical complete combustion, complete combustion, incomplete combustion and partial incomplete combustion), stoichiometric air, excess air, percent excess air, deficiency of air, percent deficiency of air Analysis of combustion products.	
6	Solving of example problems	
7	Enthalpy of reaction and enthalpy of formation. Heating value of the fuels Solving problem related on combustion products	
8	First-Law analysis of systems reacting	
9	Repeating courses and midterm exam	
10	General reaction equations for types of introductory magnitudes. Volumetric fraction of products and calculation of maximum CO2 Analysis of incomplete combustion and partial	
11	Solving of example problems Concept of equilibrium constant	
12	Adiabatic flame temperature, analysis of the second law	
13	Thermal disosiyasyon and its effect on emissions, hazards,control	
14	Midterm exams	
22	Textbooks, References and/or Other Materials:	1.Borat, O.; Balcı, M.; Sürmen, A.; "Yanma Aerotermokimyası"; Gazi Üniversitesi Teknik Eğitim 2.Çengel Y.A.; Boles M.A. "Mühendislik Yaklaşımıyla Termodinamik", Literatür Yayınevi, ISBN: 975-7860-78-6, 3.Gürgönal, B.; Soruşbay, C.; Arslan, E.; Ergeneman, M.; "İçten yanmalı motorlar"; Birsen yayınevi, İstanbul,1995. 4.Öz, İ.H., Borat, O., Sürmen, A., Çalik, V., Balcı, M.; "İçten Yanmalı Motorlar". Birsen Yayınevi, 2003, ISBN: 975511346-0. 5.Telli Z.K., "Yakıtlar ve Yanma", Palme yayıncılık, ISBN: 975-7477-39-7, Ankara, 1998. 6.Surmen A., Karamangil M.I., Arslan R. "Motor Termodinamiği", Alfa Aktüel Basım Yayım Dağıtım Ltd Şti, Eylül 2004, ISBN: 975-253-002-8.
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	12	4.00	48.00
Homeworks	2	24.00	48.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	3.00	3.00
Others	0	0.00	0.00
Final Exams	1	3.00	3.00
Total Work Load			144.00
Total work load/ 30 hr			4.80
ECTS Credit of the Course			4.00

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	30.00
Quiz	0	0.00

Home work-project	2	20.00
Final Exam	1	50.00
Total	4	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	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	4	0	0	3	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0
ÖK5	3	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
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	**1 very low**		**2 low**			**3 Medium**			**4 High**			**5 Very High**				