AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Heat Exhangers								
Course Code	MME505		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	195 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The aim of this course is to provide the students with common types of heat exchangers; namely hair-pin, shell-and-tube, gasket-plate, and compact heat exchangers, fouling of surfaces, fouling in designs, rating and sizing problems in heat exchanger design.								
Course Content	Classification of heat exchangers, design methods of het exchangers, heat exchanger pressure drop and pumping power, material selection for exchangers. Design projects.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Project Based Study, Individual Study, Problem Solving								
Name of Lecturer(s)	Assoc. Prof. Mustafa ASKER								

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	15
Final Examination	1	60
Quiz	4	15
Assignment	5	5
Term Assignment	1	5

Recommended or Required Reading	
1	Kakac, S., Pramuanjaroenkij, A., Liu, H., Heat Exchangers: Selection, Rating and Thermal Design, 2nd edition, CRC Press, 2002.
2	Kays, W.M., London A.L., Compact Heat Exchangers, 3rd edition, Krieger Publishing Company, 1998.
3	Shah, R.K., Sekulic D.P., Fundamentals of heat exchanger design, 1st edition, Wiley, 2002.

Week	Weekly Detailed Course Contents	
1	Theoretical	Classification of heat exchangers
2	Theoretical	Fundamental Definitions
3	Theoretical	Temperature Profiles in Steady Conditions
4	Theoretical	Variable Heat Transfer Temperature Coefficients
5	Theoretical	Design of Heat Exchangers With Fins
6	Theoretical	Design of Evaporators
7	Theoretical	Design of Evaporators
8	Intermediate Exam	Midterm Exam
9	Theoretical	Design of Compact Heat Exchangers
10	Theoretical	Design of Compact Heat Exchangers
11	Theoretical	Air-Cooled Heat Exchangers
12	Theoretical	Shell-and-Tube Reboilers
13	Theoretical	Pressure Drop In Heat Exchangers
14	Theoretical	Pressure Drop In Heat Exchangers
15	Theoretical	Material Selection and Stress Calculations In Heat Exchangers
16	Final Exam	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	16	2	4	96
Lecture - Practice	5	0	3	15
Term Project	1	15	10	25
Quiz	4	4	1	20

Midterm Examination	1	15	2	17
Final Examination	1	20	2	22
			Total Workload (Hours)	195
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To be able to classify the heat exchangers
2	To be able to calculate overall heat transfer coefficient
3	To be able to analyse the heat exchanger using log mean temperature difference
4	To be able to analyse the heat exchanger using effectiveness-number of transfer unit methods
5	To be able to analyse of shell-tube heat exchanger
6	To be able to calculate pressure drop and pumping power
7	To be able to select materials for heat exchanger design
8	To be able to calculate the strength of materials for heat exchangers

Programme Outcomes *(Mechanical Engineering Master's Without Thesis)*	
1	To be able to access wide and deep information with scientific researches in the field of Engineering, evaluate, interpret and implement the knowledge gained in his/her field of study
2	To be able to complete and implement “limited or incomplete data” by using the scientific methods
3	To be able to consolidate engineering problems, develop proper method(s) to solve and apply the innovative solutions to them
4	To be able to develop new and original ideas and method(s), to develop new innovative solutions at design of system, component or process
5	To be able to gain comprehensive information on modern techniques, methods and their borders which are being applied to engineering
6	To be able to design and apply analytical, modeling and experimental based research, analyze and interpret the faced complex issues during the design and apply process
7	To be able to gain high level ability to define the required information and data
8	To be able to work in multi-disciplinary teams and to take responsibility to define approaches for complex situations
9	To be able to transfer of the process and results of studies at national and international environments systematic and clear verbal or written
10	To be able to become aware of social, scientific and ethical values guarding adequacy at all professional activities and at the stage of data collection, interpretation, and announcement
11	To be able to become aware of new and developing application of profession and ability to analyze and study on those applications
12	To be able to gain ability to interpret engineering application’s social and environmental dimensions and it’s compliance with the social environment

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5	L6	L7	L8
P1	4	4	4	4	4	3	4	5
P2	3	3	4	4	4	3	4	5
P3	5	5	5	5	4	4	4	5
P4	3	3	3	3	3	3	4	4
P5	4	4	3	3	3	3	4	4
P6	4	4	4	5	4	4	4	4
P7	5	4	4	4	4	4	4	5
P8	4	4	3	4	3	4	4	4
P9	4	3	5	3	4	4	4	4
P10	3	4	5	4	4	5	5	5
P11	4	5	5	5	5	5	4	4
P12	3	4	5	5	3	3	4	5