Course name: MCE 503 – Heat Exchangers				**Department:** Mechanical Engineering				
Semester	**Methods of Education**							**Credit (ECTS)**
	Lecture	Recitation /(Etude)	Lab.	Project/Field Study	Homework	Other	Total	**7.5**
Fall/Spring	42	78		35	50	20	225	
Language	English							
Compulsory/Elective	Elective							
Prerequisites	Heat Transfer, Thermodynamics, Fluid Mechanics.							
Course Contents	Basic concepts in heat exchangers; Heat exchangers constructions; Flow arrangements in heat exchangers; Thermal calculations of heat exchangers; The ΔT_{LMTD}, θ–P, and ε–NTU methods and comparison of these methods; Thermal calculations of basic heat exchangers: *Kern* and *Bell* methods; Thermal calculations of regenerators and compact heat exchangers; Pressure drop calculations in some heat exchangers; Material selection and strength calculations in heat exchangers; Some example projects.							
Course Objectives	The objective of the course is to give the students the basics of heat exchanger analysis.							
Learning Outcomes and Competences	The students will be able to analyze and design heat exchangers.							
Textbook and/or References	**Textbook:** Kakaç S., and Liu H., "Heat Exchangers: Selection, Rating and Thermal Design", CRC Press LLC, 1998. **Additional Resources** **[1]** Genceli O. F., "Isı Değiştiricileri", Birsen Yayınevi, İstanbul, 1999. (*Secondary source.*) **[2]** Kakaç S. "Heat Exchanger Fundamentals and Applications", Course Textbook, İstanbul Technical University, 1996. **[3]** Kakaç S., A. E. Bergless, F. Mayinger "Heat Exchangers: Thermo-Hydraulic Fundamentals and Design", Wiley, New York, 1981. **[4]** Dagsoz A. K., "Isı Değiştiricileri" İTÜ Kütüphanesi Yayını, Sayı:1311, 1985. **[5]** Onat K., "Isı Eşanjörleri (Değiştirgeçleri) Ders Notları", İTÜ Makine Fak., 1979. **[6]** Kays W. M., and London A. L., "Compact Heat Exchangers", 3rd Edition, McGraw-Hill, NewYork, 1984. **[7]** Fraas A. P. and Özışık M. N., "Heat Exchanger Design", John Wiley & Sons, London, 1965.							
Assessment Criteria					**If any, mark as (x)**		**Percentage (%)**	
	Midterm exams				x		20	
	Quizzes							
	Home works				x		15	
	Projects				x		10	
	Term paper				x		5	
	Laboratory work							
	Other							
	Final exam				x		50	
Instructors	Assist. Prof. Dr. Kemal BİLEN							
Week	**Subject**							
1	Basic concepts in heat exchangers							
2	Heat exchangers constructions							
3	Heat exchangers constructions							
4	Flow arrangements in heat exchangers							
5	Thermal calculations of heat exchangers							
6	The ΔT_{LMTD} and θ–P methods							
7	The ε–NTU method and comparison of ΔT_{LMTD}, θ–P and ε–NTU methods							
8	Thermal calculations of basic heat exchangers: *Kern* and *Bell* methods							
9	Thermal calculations of regenerators							
10	Thermal calculations of compact heat exchangers							
11	Pressure drop in heat exchangers							
12	Pressure drop calculations in some heat exchangers							
13	Material selection and strength calculations in heat exchangers							
14	Some example project in heat exchangers							