Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
G371	Finansal Sistemler ve Kaos	5	3	0	0	3	5

Prerequisites	
Admission Requirements	

Language of Instruction	Turkish
Course Type	Elective
Course Level	Bachelor Degree
Objective	This course aims to examine financial systems not merely as linear structures tending towards equilibrium, but as systems that exhibit nonlinear and complex dynamics arising from feedback mechanisms, expectations, leverage, liquidity, and network interconnections. It seeks to equip students with the ability to assess financial fluctuations, crises, contagion processes, and policy interventions using chaos theory, complexity economics, and systemic risk approaches. The course also aims to develop an understanding of the conditions under which small changes can generate large market movements and how behaviour that appears rational at the individual level can produce instability at the systemic level.
Content	The course begins with the fundamental components and functioning of financial systems before examining linear and nonlinear dynamics, the core concepts of chaos theory, sensitivity to initial conditions, feedback mechanisms, bifurcations, attractors, and irregularities in financial time series. Financial markets are examined as complex adaptive systems, with particular attention to expectations, herding behaviour, speculative bubbles, leverage cycles, liquidity spirals, bank runs, runs on investment funds, shadow banking, financial networks, and mechanisms of systemic contagion. The responses of central banks, regulatory institutions, and other public authorities to financial crises are analysed through selected case studies from the global and Turkish economies. The course also examines the capacity of financial stability policies to prevent crises and the unintended consequences of policy interventions.
References	Hamilton, J. D. (1994). Time Series Analysis. Princeton University Press. Hayashi, F. (2000). Econometrics. Princeton University Press. Kantz, H., & Schreiber, T. (2004). Nonlinear Time Series Analysis (2nd ed.). Cambridge University Press. Lütkepohl, H. (2005). New Introduction to Multiple Time Series Analysis. Springer. R , Eviews, Stata

Theory Topics

Week	Weekly Contents
1	System theory introduction
2	Financial systems
3	Financial systems
4	Decision making and rationality
5	error term and its distribution
6	Efficient markets hypothesis
7	Stochastic financial value function
8	Linear stochastic systems
9	Stability, balance and stability
10	Stability tests
11	AR(p), MA(q), ARMA(p,q)
12	Nonlinear stochastic systems
13	Nonlinear stochastic systems
14	BDS test