

Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
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IND404	System Dynamics	8	3	0	0	3	4
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Prerequisites IND304

Admission Requirements IND304

Language of Instruction French

Course Type Elective

Course Level Bachelor Degree

Objective This course is designed to develop an understanding of complex systems. It aims to equip students with an advanced knowledge of causal mapping technique.

Content Definition of a system, Complex systems, The modeling process, Structure and behavior of dynamic systems, Causal links, Causal loop diagrams, Stocks and Flows, Dynamics of stocks and flows, Dynamics of simple structures, The dynamics of growth, Delays

References Sterman, J. D., "Business Dynamics: Systems Thinking and Modeling for a Complex World", Irwin McGraw-Hill, Boston, MA, 2000.

Morecroft, J., "Strategic Modelling and Business Dynamics: A Feedback Systems Approach", John Wiley and Sons, England, 2007.

Erkut, H., "Analiz, Tasarım ve Uygulamalı Sistem Yönetimi", İrfan Yayıncılık, İstanbul, 2005.

Theory Topics

Week

Weekly Contents

- 1 Definition of a system
- 2 Complex systems
- 3 The modeling process
- 4 Structure and behavior of dynamic systems
- 5 Causal links
- 6 Causal loop diagrams
- 7 Causal loop diagrams
- 8 Stocks and Flows
- 9 Midterm exam
- 10 Dynamics of stocks and flows
- 11 Dynamics of simple structures
- 12 The dynamics of growth • S- shaped growth
- 13 The dynamics of growth • Path dependence and positive feedback
- 14 Delays