

SYSTEM MODELING AND SIMULATION

1	Course Title:	SYSTEM MODELING AND SIMULATION
2	Course Code:	OTO5159
3	Type of Course:	Optional
4	Level of Course:	Second Cycle
5	Year of Study:	1
6	Semester:	1
7	ECTS Credits Allocated:	6.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Doç. Dr. ZELİHA KAMIŞ KOCABIÇAK
15	Course Lecturers:	-
16	Contact information of the Course Coordinator:	Uludağ Üniversitesi, Mühendislik Fakültesi, Otomotiv Mühendisliği Bölümü 16059 Görükle/BURSA zkamis@uludag.edu.tr; Tel: 0224 2941992
17	Website:	
18	Objective of the Course:	Performing system modeling and analysis using different modeling techniques
19	Contribution of the Course to Professional Development:	System modeling and analysis using different modeling techniques.
20	Learning Outcomes:	

	1	Understanding the concept of modeling
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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	2	21.00	42.00
Homeworks	1	56.00	56.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	0	0.00	0.00
Others	0	0.00	0.00
Final Exams	1	42.00	42.00
Total Work Load			182.00
Total work load/ 30 hr			6.07
ECTS Credit of the Course			6.00

21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	Introduction	
2	Mathematical description of system elements	
3	Modeling of engineering systems	
4	Equation formulation and simulation techniques	
5	State space representation and analysis	
6	Simulation examples in MATLAB/Simulink environment	
7	System graph method	

8	System graph method applications	
9	Bond graph method	
10	Bond graph method applications	
11	Engineering applications, programming dynamic system models	
12	Modeling with Simscape	
13	Simscape applications	
14	An overview	

22	Textbooks, References and/or Other Materials:	"Mühendislik Sistemlerinin Modellenmesi ve Dinamiği", Prof. Dr. Y. Ercan, Literatür yayınları, 2.baskı 2003 "Introduction to System Dynamics", Shear, J.L., Murphy, A.T ve Ricardson, Addison-Wesley, 1971 "Sistem Dinamiğine Giriş", Çev. Prof. Dr. A. Barkana, Bilim Teknik Yayınları, 1984 "Introduction to Physical System Dynamics", Rosenberg, R. C. ve Karnopp, D. C., McGraw-Hill, 1983 "System Dynamics-Modeling and Simulation of Mechatronic Systems", D. C. Karnopp, D.L. Margolis, R. C. Rosenberg, 2000, 3. Edition, John & Wiley. "Modeling, Analysis, and Control of Dynamic Systems", W. J. Palm III, 2.edition, 1999, John & Wiley "Mühendislik Sistemlerinin Analizi, Kısım II", Prof. Dr. Y. Tokad, Yıldız Üniversitesi Yayınları, 1985 "Lagrangian Dynamics", Wells, D. A., Schaum's Outline Series, YARDIMCI KAYNAKLAR "MATLAB ile Mühendislik Sistemlerinin Analizi ve Çözümü" Prof. Dr. İbrahim YÜKSEL, Dora, 4.baskı, 2014. OTOMATİK KONTROL, Sistem Dinamiği ve Kontrol, Dora Yayınları, İbrahim YÜKSEL, 9. Baskı, 2009
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23	Assesment		
TERM LEARNING ACTIVITIES		NUMBE R	WEIGHT
Midterm Exam		0	0.00
Quiz		0	0.00
Home work-project		1	40.00
Final Exam		1	60.00
Total		2	100.00
Contribution of Term (Year) Learning Activities to Success Grade			40.00
Contribution of Final Exam to Success Grade			60.00
Total			100.00
Measurement and Evaluation Techniques Used in the Course			Relative evaluation system

24	ECTS / WORK LOAD TABLE
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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	0	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	5	3	5	1	0	0	0	1	3	1	0	0	0	0	0	0

ÖK3	5	3	5	1	0	0	0	1	3	2	0	0	0	0	0	0
ÖK4	5	3	5	2	0	0	0	1	3	2	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			