

LARGE SCALE OPTIMIZATION

1	Course Title:	LARGE SCALE OPTIMIZATION
2	Course Code:	END6151
3	Type of Course:	Optional
4	Level of Course:	Third Cycle
5	Year of Study:	2
6	Semester:	3
7	ECTS Credits Allocated:	7.50
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	END5101 Mathematical Programming
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Doç. Dr. BURCU ÇAĞLAR GENÇOSMAN
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	e-posta: burcucaglar@uludag.edu.tr, Telefon: + 90 (224) 294 20 89 Adres: Bursa Uludağ Üniversitesi, Mühendislik Fakültesi, Endüstri Mühendisliği Bölümü, Görükle Kampüsü, 16059 Nilüfer, Bursa
17	Website:	
18	Objective of the Course:	This course aims to provide students with the ability to model and solve combinatorial optimization problems with the techniques that will be taught in the course.
19	Contribution of the Course to Professional Development:	It's been planned to contribute to professional development by analyzing real-life problems with scientific methods and providing solutions.
20	Learning Outcomes:	
	1	Learning search and relaxation algorithms used in large-scale combinatorial problems.
	2	Representation of a combinatorial problem with the basic constraint expressions of the constraint solver and creating a constraint programming model.
	3	Modeling real-world integer problems with constraint programming.
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21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	Review on Linear Optimization	

2	Effective modeling in integer programming, search algorithms	
3	Lagrangian Relaxation and Duality	
4	Lagrangian Relaxation and Duality	
5	Dantzig-Wolfe Decomposition	
6	Column generation	
7	Benders Decomposition and Delayed Constraint Generation	
8	Logic-Based Benders decomposition	
9	Review on Nonlinear Optimization	
10	Cutting-plane and dynamic constraint generation	
11	Parallel computing	
12	Constraint programming	
13	Constraint programming	
14	Project Presentations	
Activites		
		Number
		Duration (hour)
		Total Work Load (hour)
Theoretical	Bazaraa, John J. Jarvis, Hanif D. Sherali, 4th Edition, 2009	36.00
Practicals/Labs	0	0.00
Self study and preperation	"Integer and Combinatorial Optimization" Laporte A. Wiley, George L. Nemhauser, William 1999	36.00
Homeworks	1	36.00
Projects	"IBM ILOG CPLEX Optimization Studio V22.1 documentation" IBM, 2024	36.00
Field Studies	0	0.00
Midterm Assessment	1	2.00
Others	0	0.00
Final Exams	1	2.00
Midterm Exam	1	2.00
Total Work Load		228.00
Self study	0	0.00
Total work load/ 30 hr	2	20.00
Home work project	2	20.00
ECTS Credit of the Course		7.50
Final Exam	1	00.00
Total	4	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		Measurement and evaluation is carried out according to the priciples of Bursa uludag University Associate and Postgraduate Education Regulation.
24	ECTS / WORK LOAD TABLE	

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	0	5	5	2	2	2	2	1	1	0	0	1	1	1	1
ÖK2	0	0	5	5	4	4	4	4	1	1	1	1	1	1	3	3
ÖK3	1	1	5	5	5	5	5	5	1	1	4	4	1	1	3	3
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low			2 low			3 Medium			4 High			5 Very High			