HEURISTIC ALGORITHMS

1	Course Title:	HEURISTIC ALGORITHMS
2	Course Code:	END5123
3	Type of Course:	Optional
4	Level of Course:	Second Cycle
5	Year of Study:	1
6	Semester:	1
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:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. NURSEL ÖZTÜRK
15	Course Lecturers:	Doç. Dr. İLKER KÜÇÜKOĞLU
16	Contact information of the Course Coordinator:	nursel@uludag.edu.tr +90 224 2942083 Bursa Uludağ Üniversitesi Endüstri Mühendisliği Bölümü
17	Website:	
18	Objective of the Course:	The objective of this course is to provide students the knowledge of Heuristic Algorithms with engineering applications.
19	Contribution of the Course to Professional Development:	The contribution of the course to the professional development is to introduce the knowledge and applications about heuristic algorithms, and to provide ability to apply the learned heuristic algorithms.
20	Learning Outcomes:	

	1	Will be able to have knowledge and understanding of heuristic algorithms
	2	Will be able to solve the engineering problems using the heuristic algorithms.
	3	Will be able to present a heuristic algorithm project
	4	
	5	
	6	
	7	
	8	
	9	
	10	

21	Course Content:	

Course Content:	

Week	Theoretical	Practice
1	Introduction to heuristic algorithms	
2	Simulated Annealing algorithm	
3	Simulated Annealing algorithm, application examples	

4	Tabu Search algorithm	
5	Tabu Search algorithm, application examples	
6	Genetic Algorithms	
7	Genetic Algorithms, application examples	
8	Differential Evolution Algorithm	
9	Ant Colony Algorithms	
10	Particle Swarm Optimization	
11	Artificial Bee Colony	
12	Artificial Immune System	
13	Application examples	
14	Presentation of projects	

22	Textbooks, References and/or Other Materials:	• Yapay Zeka Optimizasyon Algoritmaları, Derviş Karaboğa, 2014, Nobel Yayın. • Handbook of Metaheuristics, Michel Gendreau and Jean-Yves Potvin, Springer. • Metaheuristics From Design to Implementation, El-Ghazali Talbi, 2009, Wiley. • Search and Optimization by Metaheuristics – Techniques and Algorithms Inspired by Nature, Ke-Lin Du and M.N.S Swamy, 2016, Birkauser.

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		14	10.00	140.00
Homeworks		2	8.00	16.00
Projects	R	1	25.00	25.00
Field Studies		0	0.00	0.00
Quiz		0	0.00	0.00
Midterm exams		0	0.00	0.00
Others		0	0.00	0.00
Final Exams		1	2.00	2.00
Total Work Load				225.00
Total work load / 30 h				7.50
ECTS Credit of the Course				7.50

• Modern Sezgisel Teknikler ve Uygulamaları, Tunçhan

23 Assesment

Contribution of Term (Year) Learning Activities to Success Grade	50.00
Contribution of Final Exam to Success Grade	50.00
Total	100.00
Measurement and Evaluation Techniques Used in the Course	Homework, Project, Final Exam

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	5	0	0	0	0	0	5	0	0	0	0	0	0	0	0
ÖK2	0	5	0	0	0	0	0	5	0	0	0	0	0	0	0	0

ÖK3	0	0	5	0	5	4	0	5	0	0	4	4	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications				

Contribution Level:	1 very low	2 low	3 Medium	4 High	5 Very High