

METAHEURISTIC ALGORITHMS

1	Course Title:	METAHEURISTIC ALGORITHMS
2	Course Code:	ELN6104
3	Type of Course:	Optional
4	Level of Course:	Third Cycle
5	Year of Study:	1
6	Semester:	2
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:	
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. FAHRİ VATANSEVER
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	Adres: Elektrik-Elektronik Mühendisliği bölümü, No:311 Tel: (224) 294 09 05 Web: http://home.uludag.edu.tr/~fahriv E-posta: fahriv@uludag.edu.tr
17	Website:	http://home.uludag.edu.tr/~fahriv
18	Objective of the Course:	To present basics, mathematical background, types, application areas, programming techniques of evolutionary algorithms theoretically and practically, and to provide to be used these in real applications
19	Contribution of the Course to Professional Development:	Effective use of metaheuristic algorithms in the professional area
20	Learning Outcomes:	
	1	To provide adequate knowledge in evolutionary algorithms concept and ability to apply for modeling and solving engineering problems using theoretical and practical knowledge in this area
	2	To gain ability to detect, to describe, to formulate and to solve problems which belong to optimization area
	3	To gain ability to develop, choose and implement modern techniques and equipment which are needed for engineering applications, ability to use information technology effectively
	4	To gain ability to design, to realize experiments, to collect data, to analyze and to interpret results for investigation problems which belong to optimization area
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21	Course Content:	
	Course Content:	

Week	Theoretical	Practice
1	Optimization	
2	Test functions, objective functions, real-world problems and statistical analysis	
3	Classification and coding	
4	Evolutionary-based optimization algorithms	
5	Evolutionary-based optimization algorithms	
6	Nature-inspired optimization algorithms (swarm-based, physic/chemistry-based, bio-inspired, human-based etc.)	
7	Nature-inspired optimization algorithms (swarm-based, physic/chemistry-based, bio-inspired, human-based etc.)	
8	Nature-inspired optimization algorithms (swarm-based, physic/chemistry-based, bio-inspired, human-based etc.)	
9	Midterm exam	
10	Nature-inspired optimization algorithms (swarm-based, physic/chemistry-based, bio-inspired, human-based etc.)	
11	Trajectory-based optimization algorithms	
12	Other optimization algorithms	
13	Up-to-date optimization algorithms	
14	Up-to-date optimization algorithms	
22	Textbooks, References and/or Other Materials:	1. Simon, D., Evolutionary Optimization Algorithms, Wiley, 2013. 2. Goldberg D E. Genetic Algorithms in Search, Optimization and Machine Learning., Addison-Wesley Longman Publishing, 1989. 3. Yang XS. Nature-Inspired Metaheuristic Algorithms. 2nd ed., Luniver Press, 2010.
23	Assesment	
TERM LEARNING ACTIVITIES		NUMBE R
		WEIGHT
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
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		Midterm and final exams
24	ECTS / WORK LOAD TABLE	

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	6.00	84.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	20.00	20.00
Others	0	0.00	0.00
Final Exams	1	34.00	34.00
Total Work Load			200.00
Total work load/ 30 hr			6.00
ECTS Credit of the Course			6.00

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	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	0	5	0	0	0	0	0	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			