ALGORITHMS

1	Course Title:	ALGORITHMS
2	Course Code:	BM5103
3	Type of Course:	Compulsory
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:	Prof. Dr. PINAR KIRCI
15	Course Lecturers:	yok
16	Contact information of the Course Coordinator:	Bilgisayar müh. bölüm binası 1. kat oda 110 pinarkirci@uludag.edu.tr
17	Website:	
18	Objective of the Course:	The goal of this course is to introduce students the advanced techniques for algorithm analysis and design.
19	Contribution of the Course to Professional Development:	The goals of this course are to study several fundemantal algorithms which are used to solve conventional computational problems and to introduce some mathematical methods and tools that are useful in the analysis of algorithms.
20	Learning Outcomes:	
	1	Students should develop proficiency in fundamental algorithmic techniques and analysis as well as the ability to implement the algorithms in a programming language.
	2	they should understand computational limitations such as NP-completeness, and how to tackle such real-world algorithmic problems via randomized and approximation techniques.
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21	Course Content:	

Course Content:

Week	Theoretical	Practice
1	Asymptotic Notation, Divide and Conquer Method	

2	Overview of Sorting Algorithms : Insertion Sort, Quicksort, Merge Sort, Heapsort	
3	Dynamic Programming : Rod Cutting Problem, Longest Common Subsequence Problem	
4	Greedy Algorithms	
5	B-Trees	
6	Fibonacci Heaps	
7	Graph Algorithms I : Breadth-first Search, Depth-First Search	
8	Graph Algorithms II : Minimum Spanning Trees, Shortest Path Algorithms	
9	Graph Algorithms III : Maximum Flow Problem	
10	Multithreaded Algorithms : Matrix Multiplication, Merge Sort	
11	Multithreaded Algorithms : Matrix Multiplication, Merge Sort	
12	Number-Theoretic Algorithms : Extended Euclid Algorithm, Miller-Rabin Primality Test, Integer Factorization	
13	String Matching Algorithms	
14	Computational Geometric Algorithms : Line Segment Algorithms, Finding the Closest Pair of Points	

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	2.00	28.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	50.00	50.00
Others	0	0.00	0.00
Final Exams	1	60.00	60.00
Total Work Load			230.00
Total work load/ 30 hr			6.00
ECTS Credit of the Course			6.00

- Michael T. Goodrich, Roberto Tamassia Algorithm
John Wiley & Sons Inc., 2002.
Algorithms.

TERM LEARNING ACTIVITIES

	NUMBER	**WEIGHT**
Quiz	0	0.00
Final Exam	1	50.00
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		written 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	3	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ÖK2	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low			2 low			3 Medium			4 High			5 Very High			