	ADVANC	ED DA	ATA STRUCTURES							
1	Course Title:	ADVAN	ADVANCED DATA STRUCTURES							
2	Course Code:	BMB3013								
3	Type of Course:	Optional								
4	Level of Course:	First Cycle								
5	Year of Study:	3								
6	Semester:	5								
7	ECTS Credits Allocated:	5.00								
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 t	face							
14	Course Coordinator:	Dr. Ögr.	Üyesi CEYDA NUR ÖZTÜRK							
15	Course Lecturers:									
16	Contact information of the Course Coordinator:	ceydanur@uludag.edu.tr								
17	Website:									
18	Objective of the Course:	To teach the design of data structures such as trees, sets, maps, heaps, and graphs and their use for the purposes of searching, sorting, traversal, compression, and indexing. To examine the proposed solutions to some practically encountered computational problems with appropriate data structures and algorithms. To enable development of applications with C++ language in this context.								
19	Contribution of the Course to Professional Development:									
20	Learning Outcomes:									
		1	Being able to program C++ applications which involve the examined data structures;							
		2	Being able to decide the appropriate data structure and algorithm to solve a problem efficiently;							
		3	Being able to compute space and time complexities at elementary level;							
		4	Being able to randomly access data elements using various hashing techniques;							
		5	Being able to accelerate searches with indexing methods;							
		6	Being able to model complex problems with graphs;							
		7	Being able to use efficient algorithms that manipulate the examined data structures;							
		8	Having knowledge about searching, sorting, traversal, and compression algorithms;							
		9	Being able to distinguish between the different techniques that are used in algorithms;							
		10								
21	Course Content:									
		Co	ourse Content:							
Week	k Theoretical Practice									

1	Basic d	Basic data structures and operations, Introduction to complexity analysis																
2	C++ pro variable	C++ programming: pointers, reference /ariables, classes																
3	C++ pro standar	C++ programming: templates, overloading, standard template library																
4	Binary s trees	AVL t	rees, F	Red bla	ack													
5	B trees, B* trees, B+ trees																	
6	6 Hashing techniques, Static and dynamic collision resolution methods																	
7	Extendible hashing, Linear hashing																	
8	Indexin	g meth	ods, S	patial	indexi	ng, K-	d tree	s										
9	Heaps,	d-heap	os, Lef	tist he	aps, S	kew h	eaps											
10	Graphs algorith	, Grapł ms	n trave	rsal, S	Shortes	st path												
11	Topolog spannir	gical so g trees	ort, Net S	works	s, Minir	num												
12	Disjoint approxi	sets a mate s	nd unio tring m	on fine natchi	d, Exac ng algo	ct and	6											
13	Searchi and ext	ng anc ernal a	l sortin pproa	ig algo ches	orithms	, inter	nal											
14	14 Compression algorithms, Review of algorithm design techniques																	
Activites							1	Number				Duration (hour)			Total Work Load (hour)			
Theoretical							+	2 0 14.	4th Edi	ition. Pe	arsola Education, IS <mark>B</mark> A-90:							
Practicals/Labs									0			0.00			0.00			
Self-study and preperation									14			3.00			42.00			
Homew	vorks							Ę	5			8.00			40.00			
Projects R								(0			0.00	0.00					
Field S	tudies					1.4		(0			0.00			0.00			
Midtern	Midterm exams									0.40			12.00			12.00		
Others	Others								0			0.00	0.00			0.00		
FIRALE	FINAI EXAMs								60100			16.00	16.00					
Total Work Load														152.00				
Contribution of Jerm (Year) Learning Activities to								40	.00					5.07				
ECTS Credit of the Course															5.00			
Total	Total									100.00								
Measurement and Evaluation Techniques Used in the programming assignments, written exams																		
24 ECTS / WORK LOAD TABLE																		
25 CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME]						
	QUALIFICATIONS																	
	PQ	1 PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ1 0	PQ11	PQ12	PQ1 3	PQ14	PQ15	PQ16		
ÖK1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
ÖK2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

ÖK3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contrib ution Level:	Contrib 1 very low ution Level:			2 low			3 Medium			4 High			5 Very High			