ABSTRACT ALGEBRA

1	Course Title:	ABSTRACT ALGEBRA	
2	Course Code:	MAT3019	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	3	
6	Semester:	5	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	2.00	
9	Practice (hour/week):	2.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. İSMAİL NACİ CANGÜL	
15	Course Lecturers:	Yrd. Doç. Dr. Musa DEMİRCİ, Yrd. Doç. Dr. Hacer ÖZDEN	
16	Contact information of the Course Coordinator:	cangul@uludag.edu.tr, 0224 2941756, Fen-Edebiyat Fakültesi, Matematik Bölümü, 16059, Görükle / Bursa	
17	Website:	http://www.ismailnacicangul.com/	
18	Objective of the Course:	To teach divisibility, congruences, linear Diophant equations, arithmetic functions, and also the applications of those together with the origins of the notions	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	Differentiates between prime and composite numbers and knows the reasons of different situations.
		2	Knows the Notion of divisibility on the ring of integers and related notions.
		3	Knows daily applications of Diophantine equations.
		4	Knows daily applications of congruences.
		5	Knows the origins and history of the main notions.
		6	Knows the corresponding English meanings of the main notions.
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21	Course Content:		

Course Content:

Week	Theoretical	Practice
1	Divisibility on integers	Divisibility examples
2	Division and Euclid algorithms and gcd and lcm	Examples of division and Euclid algorithms
3	Linear Diophantine equations	Examples of linear Diophantine equations

4	Fundamental theorem of arithmetic and divisors	Examples of the number and the sum of the divisors of a number
5	Euler ?-function	Calculation of the values of Euler ?-function
6	Properties of Euler ?-function	Examples of properties
7	Congruences	Examples of congruences
8	Operations in Zm and properties of congruences	Examples of properties
9	Midterm exam, Euler and Fermat theorems	Examples of Euler and Fermat theorems
10	Linear congruences with one variable	Examples of linear congruences
11	Linear congruences and linear Diophantine equations	Relation between linear congruences and linear Diophantine equations
12	Congruence systems	Solution of congruence systems
13	Quadratic residues and Legendre symbol	Calculation of quadratic residues
14	Gauss' quadratic reciprocity law	Applications of reciprocity law

22	Textbooks, References and/or Other Materials	1. Sayılar Teorisi Problemleri, İsmail Naci Cangül & Basri Celik, 2005

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	14	2.00	28.00
Self study and preperation	14	5.00	70.00
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	28.00	28.00
Total Work Load			194.00
Total work load/ 30 hr			5.80
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	2	0	0	0	2	2	0	0	0	0	0	0	0	0
ÖK2	5	3	0	0	2	0	5	2	0	0	0	0	0	0	0	0
ÖK3	3	0	0	0	3	0	5	2	2	0	0	0	0	0	0	0
ÖK4	5	0	0	0	0	0	0	2	2	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	5	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**