

# 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:	<a href="http://www.ismailnacicangul.com/">http://www.ismailnacicangul.com/</a>	
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:		
		<b>Course Content:</b>	
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 $\phi$ -function	Calculation of the values of Euler $\phi$ -function
6	Properties of Euler $\phi$ -function	Examples of properties
7	Congruences	Examples of congruences
8	Operations in $Z_m$ 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 Çelik, 2005
23	Assesment	
<b>TERM LEARNING ACTIVITIES</b>		
	<b>NUMBER</b>	<b>WEIGHT</b>
Midterm Exam	1	40.00
Quiz	0	0.00
Homeworks, Performances	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		
24	<b>ECTS / WORK LOAD TABLE</b>	

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, Performances	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
<b>LO: Learning Objectives    PQ: Program Qualifications</b>																
<b>Contribution Level:</b>	<b>1 very low</b>		<b>2 low</b>			<b>3 Medium</b>			<b>4 High</b>			<b>5 Very High</b>				