INTRODUCTION TO THE THEORY OF ELLIPTIC CURVES									
1	Course Title:	INTROD	UCTION TO THE THEORY OF ELLIPTIC CURVES						
2	Course Code:	MAT4081							
3	Type of Course:	Optional							
4	Level of Course:	First Cycle							
5	Year of Study:	4							
6	Semester:	7							
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:	none							
12	Language:	Turkish							
13	Mode of Delivery:	Face to face							
14	Course Coordinator:	Prof. Dr. OSMAN BİZİM							
15	Course Lecturers:	Prof. Dr. Osman Bizim							
16	Contact information of the Course Coordinator:	Uludağ Üniversitesi, Fen-Edebiyat Fakültesi Matematik Bölümü, Görükle Bursa-TÜRKİYE 0 224 294 17 50 / obizim@uludag.edu.tr							
17	Website:								
18	Objective of the Course:	The theory of elliptic curves brings important areas of mathematics such as abstract algebra, number theory and related fields. The aim of this course is to make the students get all connections among all these areas. The goal is to teach the elementary theory of elliptic curves. So students can know the basic theory of elliptic curves.							
19	Contribution of the Course to Professional Development:								
20	Learning Outcomes:								
		1	Use elliptic curves to solve some problems of mathematics.						
		2	Learn the group structure of the points on the elliptic curves.						
		3	Learn the j-invariant of an elliptic curve and isomorphisms and endomorphisms of the curves						
		4	Learn the singular curves and determine group law of singular curves.						
		5	Learn the torsion points of an elliptic curve and learn division polynomials of an elliptic curve.						
		6	Learn elliptic curves over finite fields and counts the number of the points on these curves.						
		7	Give some results about the numbers of the points of the elliptic curves over finite fields						
		8	Learn the elliptic curves over Q and the torsion subgroup and the Lutz-Nagell theorem.						
		9	Learn the method of descent of Fermat and the Mordell-Weil theorem.						
		10	Learn the elliptic curves over C.						
21	Course Content:								
	Course Content:								

Week	Theoretical		Practice			
1	Basic concepts on groups, rings and	fields.				
2	Use elliptic curves to solve some promathematics.	blems of				
3	The group law on the elliptic curves a of associativity.	and proof				
4	Other equations for elliptic curves, Le equation, cubic equations and quartic equations.					
5	The j-invariant of an elliptic curve and isomorphisms and endomorphisms o curves.					
6	The singular curves and determining law of singular curves.	group				
7	Torsion points of elliptic curves and d polynomials of an elliptic curve.	livision				
8	Elliptic curves over finite fields, count number of the points on these curves theorem of Hasse.					
9	Determining the group structure of th on the elliptic curves over finite fields group order.					
10	Some family of elliptic curves over fin fields.	ite				
11	The elliptic curves over Q and the tor subgroup and the Lutz-Nagell theore					
12	The method of descent of Fermat and Mordell-Weil theorem.	d the				
13	The elliptic curves over C.					
14	Overview on Fermat's last theorem.					
22	Textbooks, References and/or Other Materials:		 [1] Rational Points on Elliptic Curves, J. H. Silverman ve J. Tate, [2]The Arithmetic of Elliptic Curves, J. H. Silverman, [3]Elliptic Curves, L. C. Washington. 			
23	Assesment					
TERM L	EARNING ACTIVITIES	NUMBE R	WEIGHT			
Midtern	n Exam	1	40.00			
Quiz		0	0.00			
Home v	vork-project	0	0.00			
Final E	xam	1	60.00			
Total		2	100.00			
	ution of Term (Year) Learning Activitie s Grade	es to	40.00			
Contrib	ution of Final Exam to Success Grade	9	60.00			
Total			100.00			
Measur Course	rement and Evaluation Techniques Us	sed in the				
24	ECTS / WORK LOAD TABLE					

Activites	5								Number			Dura	Duration (hour)			Total Work Load (hour)	
Theoretical									14			3.00	3.00		42.00		
Practicals/	Practicals/Labs								0			0.00	0.00		0.00		
Self study	Self study and preperation								14			5.00	5.00		70.00		
Homework	Homeworks								0			0.00	0.00		0.00		
Projects	Projects								0			0.00	0.00		0.00		
Field Stud	Field Studies								0			0.00	0.00		0.00		
Midterm e	m exams								1			15.00	15.00		15.00		
Others									14			1.00	1.00		14.00		
Final Exar	Final Exams								1			9.00	9.00		9.00		
Total Work Load															150.00		
Total work load/ 30 hr															5.00		
ECTS Cre	ECTS Credit of the Course										5.00						
25			CON	TRIE	BUTIC	N O				OUTO	OME:	S TO	PROC	SRAM	ME		
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ1 0	PQ11	PQ12	PQ1	PQ14	PQ15	PQ16	
ÖK1	5	5	5	5	5	5	5	5	5	5	0	0	0	0	0	0	
ÖK2	5	5	5	5	5	5	5	5	5	5	0	0	0	0	0	0	
ÖK3	5	5	5	5	5	5	5	5	5	5	0	0	0	0	0	0	
ÖK4	5	5	5	5	5	5	5	5	5	5	0	0	0	0	0	0	
ÖK5	5	5	5	5	5	5	5	5	5	5	0	0	0	0	0	0	
ÖK6	5	5	5	5	5	5	5	5	5	5	0	0	0	0	0	0	

LO: Learning Objectives PQ: Program Qualifications

ÖK7

ÖK8

ÖK9

ÖK10

Contrib	1 very low	2 low	3 Medium	4 High	5 Very High
ution					
Level:					