	THEORY OF ELLIPTIC	CUR	VES AND ITS APPLICATIONS II							
1	Course Title:	THEOR'	Y OF ELLIPTIC CURVES AND ITS APPLICATIONS II							
2	Course Code:	MAT611	2							
3	Type of Course:	Optional								
4	Level of Course:	Third Cycle								
5	Year of Study:	1								
6	Semester:	2								
7	ECTS Credits Allocated:	5.00								
8	Theoretical (hour/week):	3.00	3.00							
9	Practice (hour/week):	0.00	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.	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 57 / 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 bring new ideas the theory of elliptic curves and have the ability conduct original research and independent publication.								
19	Contribution of the Course to Professional Development:									
20	Learning Outcomes:									
		1	Learn the elliptic curves over C, construction of elliptic functions, analytic and algebraic maps.							
		2	Learn Elliptic curves over global fields, heights on elliptic curves, the rank of an elliptic curve.							
		3	Learn Siegel's theorem, Shafarevich's theorem and Roth's theorem.							
		4	Learn computing the Mordell-Weil group an examples.							
		5	Learn algorithmic aspects of elliptic curves and Lenstra's elliptic curve algorithm.							
		6	Learn cohomology of finite groups and Galois cohomology, non abelian cohomology.							
		7								
		8								
		9								
		10								
21	Course Content:									
	Course Content:									

Week	Theoretical		Practice
1	Algebraic varieties and maps betwee varieties, algebraic curves and maps them.		
2	The Riemann-Roch theorem, the geo elliptic curves, Weiestrass's equation isogenies, dual isogenies.	s,	
3	Endomorphism rings and the automo groups, the formal group of an elliptic formal logarithm.	curve,	
4	Formal groups in characteristic p, elli curves over finite fields, the Weil concalculating the Hasse invariant.		
5	Elliptic curves over C, construction of functions, analytic and algebraic map		
6	Elliptic curves over local fields, minim Weierstrass equations, reductions an of finite order.		
7	Elliptic curves over global fields, heig elliptic curves, the rank of an elliptic c		
8	Siegel's theorem, Shafarevich's theo Roth's theorem.		
9	Computing the Mordell-Weil group ar examples.	1	
10	The Selmer and Shafarevich-Tate gro	oups.	
11	The twists of elliptic curves and appli over some family of elliptic curves.	cations	
12	Algorithmic aspects of elliptic curves Lenstra's elliptic curve algorithm.	and	
13	Elliptic curves in characteristics 2 and	d 3.	
14	Cohomology of finite groups and Galcohomology, non abelian cohomolog		
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. [4] Introduction to Elliptic Curves and Modular Forms, N. Koblitz.
23	Assesment		
TERM L	EARNING ACTIVITIES	NUMBE R	WEIGHT
Midtern	n Exam	0	0.00
Quiz		0	0.00
	work-project	0	0.00
Final E	xam	1	100.00
Total		1	100.00
Contribution of Term (Year) Learning Activities to Success Grade			0.00
Contrib	ution of Final Exam to Success Grade)	100.00
Total			100.00
Measui Course	rement and Evaluation Techniques Us	sed in the	
24	ECTS / WORK LOAD TABLE		

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	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	0	0.00	0.00
Others	14	5.00	70.00
Final Exams	1	13.00	13.00
Total Work Load			195.00
Total work load/ 30 hr			6.50
ECTS Credit of the Course			5.00

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ1 0	PQ11	PQ12	PQ1 3	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																
Contrib 1 very low ution Level:			2	2 low			3 Medium		4 High			5 Very High				