

LOCAL RINGS II

1	Course Title:	LOCAL RINGS II	
2	Course Code:	MAT6324	
3	Type of Course:	Optional	
4	Level of Course:	Third Cycle	
5	Year of Study:	2	
6	Semester:	4	
7	ECTS Credits Allocated:	6.00	
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. Atilla AKPINAR	
15	Course Lecturers:	Prof. Dr. Basri ÇELİK Doç. Dr. Fatma ÖZEN ERDOĞAN	
16	Contact information of the Course Coordinator:	E-posta: aakpinar@uludag.edu.tr Telefon: +90 224 2941774 Adres: Bursa Uludağ Üniversitesi Fen-Edebiyat Fakültesi Matematik Bölümü 16059 Görükle-Bursa-TÜRKİYE	
17	Website:		
18	Objective of the Course:	To better understand the geometric structures that can be construct on local rings is to examine the properties of such rings in more detail.	
19	Contribution of the Course to Professional Development:	To understand the properties of algebraic structures	
20	Learning Outcomes:		
		1	Knows the concept of dualize
		2	Learns the concepts of amplitude and dimension
		3	Learns Serre's condition
		4	Constructs power series over an algebraic structure
		5	Finds the rank of a lineer map
		6	Learns the McRae's invariant
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21	Course Content:		
		Course Content:	
Week	Theoretical	Practice	
1	Description of the course, Poincare series		
2	Grothendieck's local duality theorem, duality for Cohen–Macaulay modules, dualizing modules		
3	Locally factorial domains, conductors, formal fibers		

4	Depth of a complex, the dual of a module	
5	The amplitude formula, dimension of a complex, the tensor product formula	
6	Depth inequalities, condition S_r of Serre	
7	Factorial rings and condition S_r , condition S_r , specialization of Poincaré series	
8	Introduction to Serre's conjectures, filtration of the Koszul complex	
9	Introduction to Serre's conjectures, filtration of the Koszul complex	
10	Euler characteristic of the Koszul complex, a projection formula, power series over a field	
11	Power series over a discrete valuation ring, application of Cohen's structure theorem, the amplitude inequality	
12	Translation invariant operators, Todd operators, Serre's conjecture in the graded case	
13	McCoy's theorem, the rank of a linear map, the Eisenbud–Buchsbaum criterion	
14	Fitting's ideals, the Euler characteristic McRae's invariant, the integral character of McRae's invariant	

Activites		Number	Duration (hour)	Total Work Load (hour)
Theoretical	Appl. Publishers, , 2000, Dordrecht.	14	3.00	42.00
Practicals/Labs		0	0.00	0.00
Self-study and preparation		14	9.00	126.00
Homeworks		0	0.00	0.00
Projects		0	0.00	0.00
Midterm Exam		0	0.00	0.00
Field Studies		0	0.00	0.00
Midterm exams		0	0.00	0.00
Home work-project		0	0.00	0.00
Others		0	0.00	0.00
Final Exams		1	12.00	12.00
Total		1	100.00	
Total Work Load				180.00
Contribution of Term (Year) Learning Activities to Total work load/ 30 hr				6.00
ECTS Credit of the Course				6.00
Total		100.00		
Measurement and Evaluation Techniques Used in the Course		The system of relative evaluation is applied.		

24	ECTS / WORK LOAD TABLE
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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	4	4	1	0	1	2	2	1	3	2	0	0	0	0	0	0
ÖK2	3	4	1	0	1	1	1	1	2	1	0	0	0	0	0	0

ÖK3	3	4	2	0	2	1	1	2	2	1	0	0	0	0	0	0
ÖK4	5	5	2	0	2	1	1	2	2	1	0	0	0	0	0	0
ÖK5	4	4	1	0	2	2	2	1	3	2	0	0	0	0	0	0
ÖK6	3	4	2	0	1	1	2	1	2	1	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			