



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Number Theory							
Course Code		MTK513		Course Level		Second Cycle (Master's Degree)			
ECTS Credit	7	Workload	175 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		This course gives the fundamental concepts of algebraic numbers.							
Course Content		Principal ideal domain and unique factorization domains, commutative fields, residue classes, quadratic residues, algebraic integers, integral basis, discriminant, the decomposition of ideals, the norm and classes of ideals, units and estimations for the discriminant, ramification, discriminant and different, the ramification of prime ideals in Galois extension, the fundamental theorem of abelian extensions, miscellaneous numerical examples.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Individual Study, Problem Solving					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	50
Assignment	1	20

Recommended or Required Reading

1	Algebraic Numbers, P. Ribenboim, Wiley-Interscience, 1972
2	Number Theory, Z. I. Borevich and I.R. Shafarevich, Academic Press, 1967

Week	Weekly Detailed Course Contents	
1	Theoretical	Principal ideal domain and unique factorization domains
2	Theoretical	Fields
3	Theoretical	Residue classes
4	Theoretical	Quadratic residues
5	Theoretical	Algebraic integers, integral basis
6	Theoretical	Discriminant
7	Theoretical	The decomposition of ideals
8	Intermediate Exam	Midterm
9	Theoretical	The norm and classes of ideals
10	Theoretical	Units and estimations for the discriminant
11	Theoretical	Ramification, discriminant and different
12	Theoretical	Ramification, discriminant and different
13	Theoretical	The ramification of prime ideals in Galois Extension
14	Theoretical	The fundamental theorem of abelian extensions
15	Theoretical	Miscellaneous numerical examples
16	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	1	10	2	12
Midterm Examination	1	32	2	34
Final Examination	1	43	2	45
Total Workload (Hours)				175
[Total Workload (Hours) / 25*] = ECTS				7

*25 hour workload is accepted as 1 ECTS



Learning Outcomes

1	To be able to give fundamental properties of number theory
2	To be able to relate number theory with other fields of algebra
3	To be able to develop some theoretical approach on number theory
4	To be able to develop individual work on number theory
5	To be able to relate number theory with some other fields except algebra

Programme Outcomes (*Mathematics Master*)

1	To be able to have an adequate theoretical and practical domain knowledge.
2	To be able to comprehend the interdisciplinary interaction associated with Mathematics.
3	To be able to use theoretical and practical domain knowledge gained in the field of Mathematics.
4	To be able to interpret knowledge from different disciplines integrating knowledge in the field of mathematics and produce new information.
5	To be able to define, analyse, model and to solve the problems by scientific methods in Mathematics.
6	To be able to conduct a math related specialistic study independently.
7	To be able to develop new strategic approaches to solve problems occurred in unforeseen and complex math-related applications by taking responsibility.
8	To be able to lead in situations that require solving problems related to the mathematics.
9	To be able to criticize his/her knowledge and skills acquired in the field mathematics.
10	To be able to transfer his/her ideas and suggestions for solutions to problems by supporting quantitative or qualitative data verbally and in writing.
11	To be able to communicate both orally and written in a foreign language.
12	To be able to use computer hardware and information technologies with software required by Mathematics.
13	To be able to contribute to the solution of the social, scientific, cultural and ethical problems related to the Mathematics, and being able to support the development of social, scientific, cultural and ethical values.
14	To be able to develop mathematics-related strategies, policies and operational plans, and to evaluate the results obtained within the framework of quality processes.
15	To be able to use his/her knowledge in the field of mathematics and practical problem-solving skills in interdisciplinary studies.

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5
P1	5	3	4	5	5
P2	5	5	4	4	5
P3	4	4	5	5	4
P4	5	4	5	5	5
P5	4	5	5	5	4
P6	3	3	3	3	3
P7	2	3	4	5	3
P11					4
P15	2	4	4	5	5

