Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
MAT204	Introduction to Group Theory	3	3	2	0	5	8

Prerequisites	
Admission Requirements	

Language of Instruction	French
Course Type	Compulsory
Course Level	Bachelor Degree
Objective	To introduce some basic algebraic structures (groups and rings) and how to study them
Content	Groups as symmetry measuring constructs, subgroups, normal subgroups, quotient groups, group homomorphisms, isomorphism theorems, group actions Rings, subrings and ideals, isomorphism theorems, irreducible and prime elements
References	Mathématique L3 Algèbre, Aviva Szpirglas Abstract Algebra: Theory and Applications, Thomas W. Judson, Robert A. Beezer http://abstract.ups.edu/aata/aata.html An Inquiry Based Approach to Abstract Algebra, Dana C. Ernst https://danaernst.com/teaching/mat411f20/IBL-AbstractAlgebra.pdf Cebir I - Temel Grup Teorisi, Ali Nesin https://nesinkoyleri.org/wp-content/uploads/2019/05/cebir.pdf

Theory Topics

Week	Weekly Contents
1	Notion of symmetry
2	Axiomatic definition of a group, group examples, operation tables, subgroup
3	Group homomorphisms, operations on groups
4	Kernel et image of homomorphisms, quotient of a group by a subgroup, Lagrange's theorem
5	Normal subgroups, quotient groups, Isomorphism theorems
6	Semi-direct products
7	Group actions on sets
8	Midterm
9	Orbit-stabiliser theorem, Sylow Theorems
10	Sylow Theorems and applications
11	Rings, ring homomorphisms, kernel and image of homomorphisms, subrings and ideals
12	Quotient rings, isomorphism theorem
13	Prime and irreducible elements
14	Unique Factorization Domains