

## Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
MAT473	Ideals, Varieties and Algorithms	8	3	0	0	3	6

Prerequisites	
Admission Requirements	

Language of Instruction	French
Course Type	Elective
Course Level	Bachelor Degree
Objective	The purpose of this course is to learn about Groebner basis which is useful to solve some problems on algebraic varieties, especially for the solution of systems of equations, to understand how to use it in the proof of theorem extension.
Content	Ring theory and fields (summary), Polynomial rings and affine space, Affine varieties, Parametrization, Ideals, One variable polynomials; Monomial orders, Division algorithm, Monomial ideals and Dickson's lemma, Hilbert bases theorem, Groebner bases, Properties of Groebner bases, Buchbergers algorithm, Applicaitons of Groebner bases; Elimination and Extension theorems, Resultants and the extension theorem.
References	Ideals, Varieties and Algorithms, D. Cox, J. Little, D. O'Shea.

## Theory Topics

Week	Weekly Contents
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