SUBJECT TEACHING GUIDE

334 - Algebra and Algorithms

Master's Degree in Mathematics and Computing

Academic year 2026 - 2027

1. IDENTIFYING DATA					
Degree	Master's Degree in Mathematics and Computing			Type and Year	Optional. Year 1
Faculty	Faculty of Sciences				
Discipline					
Course unit title and code	334 - Algebra and Algorithms				
Number of ECTS credits allocated	3	Term		Semester based (1)	
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. MATEMATICAS, ESTADISTICA Y COMPUTACION
Name of lecturer	DAVID SENOVILLA SANZ
E-mail	david.senovilla@unican.es
Office	
Other lecturers	

3.1 LEARNING OUTCOMES
Compute resultants, factor univariate polynomials, work with semialgebraic sets, curves and surfaces from an algorithmic point of view.

4. OBJECTIVES
Show the connection between algebra and algorithms via aplications

6. COURSE ORGANIZATION	
CONTENTS	
1	Factorisation of univariate polynomials. Real equation and inequation systems. Elimination theory. Manipulation of curves and surfaces

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessment	%
Personal work	Others	No	Yes	100,00
TOTAL				100,00
Observations				
Observations for part-time students				
Part time students will follow the same evaluation as regular students				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
Saugata Basu, Richard Pollack, Marie-Françoise Roy: Algorithms in Real Algebraic Geometry. Springer-Verlag, 2006.
Joachim von zur Gatten y Jürgen Gerhard: Modern Computer Algebra. Cambridge University Press, 1999.
J. Rafael Sendra, Franz Winkler, Sonia Pérez-Díaz: Rational algebraic curves : a computer algebra approach,Springer, 2008.
Michel Coste: An introduction to Semialgebraic Geometry. Curso manuscrito RAAG Network, Universidad de Rennes, Francia. (Acceso libre en la web)