

## SUBJECT TEACHING GUIDE

### 334 - Algebra and Algorithms

#### Master's Degree in Mathematics and Computing

Academic year 2023-2024

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	JESUS JAVIER JIMENEZ GARRIDO				
E-mail	jesusjavier.jimenez@unican.es				
Office	Facultad de Ciencias. Planta: + 0. DESPACHO JESUS JAVIER JIMENEZ GARRIDO (0061)				
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 applications

6. COURSE ORGANIZATION	
CONTENTS	
1	Factorisation of univariate polynomials
2	Real algebraic geometry, quantifier elimination
3	Curves and surfaces in computer aided geometry

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Personal work	Others	No	Yes	100,00
TOTAL				100,00
Observations				
Observations for part-time students				
Part time student 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)