

SUBJECT TEACHING GUIDE

M1516 - Algebra and Algorithms

Master's Degree in Mathematics and Computing

Academic year 2022-2023

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	M1516 - Algebra and Algorithms				
Number of ECTS credits allocated	3	Term	Semester based (2)		
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 Gathen 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)