Teaching Guide				
Identifying Data				2022/23
Subject (*)	Biomedical Image Analysis		Code	614535013
Study programme	Máster Universitario en Visión por Computador			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	2nd four-month period	First	Optional	6
Language	English			
Teaching method	Hybrid			
Prerequisites				
Department	Ciencias da Computación e Tecnoloxías da Información			
Coordinador	Novo Bujan, Jorge	E-mail	j.novo@udc.es	
Lecturers	De Moura Ramos, Jose Joaquim Novo Bujan, Jorge	E-mail	joaquim.demoura@udc.es j.novo@udc.es	
Web				
General description				

Study programme competences	
Code	Study programme competences
A1	CE1 - To know and apply the concepts, methodologies and technologies of image processing
A2	CE2 - To know and apply machine learning and pattern recognition techniques applied to computer vision
A5	CE5 - To analyze and apply methods of the state of the art in computer vision
A7	CE7 - To understand and apply the fundamentals of medical image acquisition, processing and analysis
A8	CE8 - To communicate and disseminate the results and conclusions of research in the field of computer vision
B1	CB6 - To possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context
B3	CB8 - That students are able to integrate knowledge and deal with the complexity of making judgements based on information that is incomplete or limited, including reflections on social and ethical responsibilities linked to the application of their knowledge and judgements
B7	CG2 - Ability to analyze a company's needs in the field of computer vision and determine the best technological solution for it
B10	CG5 - Ability to identify unsolved problems and provide innovative solutions
B11	CG6 - Ability to identify theoretical results or new technologies with innovative potential and convert them into products and services useful to society
C3	CT3 - Development of the innovative and entrepreneurial spirit

Learning outcomes			
Learning outcomes	Study programme competences		
Knowledge of specific advanced techniques for biomedical image processing and analysis.	AC1 AC2 AC5 AC7 AC8	BC1 BC3 BC7 BC10 BC11	CC3
Analysis of current biomedical imaging applications, and ability to evaluate existing solutions, as well as the development of new specific solutions	AC1 AC2 AC5 AC7 AC8	BC1 BC3 BC7 BC10 BC11	CC3

Evaluation of the adequacy of applied methodologies in a multidisciplinary context for biomedical environments.	AC1 AC2 AC5 AC7 AC8	BC1 BC3 BC7 BC10 BC11	CC3
Ability to write documentation and reports on scientific and technical results.	AC1 AC2 AC5 AC7 AC8	BC1 BC3 BC7 BC10 BC11	CC3

Contents	
Topic	**Sub-topic**
Advanced biomedical image processing and analysis techniques	
Advanced segmentation techniques in biomedical imaging	
Pattern recognition in biomedical imaging	
Advanced brain imaging techniques	
Advanced biomedical image analysis applications	

Planning				
Methodologies / tests	**Competencies**	**Ordinary class hours**	**Student?s personal work hours**	**Total hours**
Laboratory practice	A5 A8 B3 B10	15	51.84	66.84
Guest lecture / keynote speech	A1 A2 A7 B1 B7 B11 C3	14	21.6	35.6
Supervised projects	A5 A8 B3 B10	10	34.56	44.56
Personalized attention		3	0	3
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	**Description**
Laboratory practice	Practice in computer classrooms, learning based on the resolution of practical cases, combining work and autonomous learning with group work for cooperative learning
Guest lecture / keynote speech	Participatory Master Lessons
Supervised projects	Presentations of project-oriented works

Personalized attention	
Methodologies	**Description**
Laboratory practice Supervised projects	Attention to the challenges that the students are exposed to both in the practices and in the works exhibited.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Laboratory practice	A5 A8 B3 B10	Development practices of applied cases	50
Supervised projects	A5 A8 B3 B10	Practical projects related to the subject	30
Guest lecture / keynote speech	A1 A2 A7 B1 B7 B11 C3	Demonstration of application of knowledge taught in class	20

Assessment comments

Sources of information	
Basic	Handbook of Biomedical Image Analysis (Editors: Wilson, David, Laxminarayan, Swamy). 2005Aly A. Farag, Biomedical Image Analysis, Statistical and Variational Methods. 2014Artigos en conferencias e revistas da área (ISBI, MICCAI, T-MI, IEEE Transactions on Biomedical Engineering, etc.) p { margin-bottom: 0.25cm; direction: ltr; line-height: 115%; text-align: left; orphans: 2; widows: 2; background: transparent }
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Fundamentals of Machine Learning for Computer Vision /614535007 Instrumentation and Processing for Machine Vision/614535009 Fundamentals of Image Processing and Analysis /614535001
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.