

## [MMD103] ADVANCED PROCESSING OF BIOMEDICAL IMAGES

### GENERAL INFORMATION

<b>Studies</b>	MASTER'S DEGREE IN BIOMEDICAL TECHNOLOGIES		<b>Subject</b>	?	
<b>Semester</b>	1	<b>Course</b>	1	<b>Mention / Field of specialisation</b>	???
<b>Character</b>	OPTIONAL		<b>Language</b>	ENGLISH	
<b>Plan</b>	2023	<b>Modality</b>	Face-to-face	<b>Total hours</b>	47.8 class hours + 27.2 non-class hours = <b>75 total hours</b>
<b>Credits</b>	3	<b>Hours/week</b>	2.66		

### PROFESSORS

MENDICUTE ERRASTI, MIKEL  
 ROMERO BASCONES, DAVID

### REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
SIGNAL AND BIOMEDICAL IMAGES PROCESSING [!] <i>Procesamiento de imagen biomédica</i> [!] <i>Procesamiento de señales biomédicas</i>	[!] <i>Bases de captura y procesamiento de imágenes biomédicas</i>

### LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
<b>MMRA16</b> - To propose advanced image processing algorithms for healthcare applications		x		2,1
<b>MMRA26</b> - To apply the knowledge acquired and your problem-solving skills in new, little-known or changing environments within broader (or multidisciplinary) contexts related to your area of study		x		0,72
<b>MMRA28</b> - To communicate your conclusions and the knowledge and ultimate reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way		x		0,18
			<b>Total:</b>	<b>3</b>

KC: Knowledge or Content / SK: Skills / AB: Abilities

### CONTENTS

- 1.- Thresholding
- 2.- Shape Analysis and feature extraction
- 3.- Texture analysis
- 4.- OCT analysis pipeline
  - 4.1.- Visualization
  - 4.2.- Preprocessing
  - 4.3.- Feature extraction
- 5.- MRI analysis pipeline
  - 5.1. Image visualization and preprocessing
  - 5.2. Image registration
  - 5.3. Brain & tissue segmentation

### LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Class presentations	Rangayyan, R. M. (2004). Biomedical image analysis. CRC press.
Technical articles	Gonzalez, R.C., & Woods, R.E. (2008). Digital Image Processing. Pearson Prentice Hall
Moodle Platform	Gonzalez, R.C., Woods, R.E., Eddins, S.L. (2009). Digital Image Processing Using MATLAB. Gatesmark Publishing
	Jenkinson, M. & Chappell, M. (2018). Introduction to Neuroimaging Analysis (Oxford Neuroimaging Primers). OUP Oxford. ISBN:978-0198816300