

COURSE: Digital Image Processing		
DEGREE: Degree on Audiovisual Systems Engineering	YEAR: 3rd	TERM: 2

WEEKLY PLANNING								
WEEK	SESSION	DESCRIPTION	TEACHING (mark X)		SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)	WEEKLY PROGRAMMING FOR STUDENT		
			LECTURES	SEMINARS		DESCRIPTION	CLASS HOURS (1,66=50+50 min)	HOMEWORK HOURS (Max. Estim. 6,5h)
1	1	Course Presentation Overview of Image Processing	x			Course Presentation Overview of Image Processing	1,66	6,5
	2	Digital Images		x		Pinhole camera model. Spatial sampling and quantification. Color models. Principal component analysis	1,66	
2	3	Intensity transformations	x			Basic Intensity transformations. Histograms. Histogram Equalization	1,66	6,5
	4	Lab Session 1: images in Matlab		x	Lab 40B01A	Images in Matlab	1,66	
3	5	Spatial Filtering	x			Low-pass filters. High-pass filters. Gaussian Filters. Statistical ordered filters	1,66	6,5
	6	Lab Session 2: Principal Component Analysis		x	Lab 40B01A	Principal Component Analysis	1,66	
4	7	DFT and Filtering in the Frequency Domain	x			DFT and DFT properties. Filtering in the Frequency Domain	1,66	6,5
	8	Lab Session 3: Histograms and Histogram Equalization		x	Lab 40B01A	Histograms and Histogram Equalization	1,66	
5	9	Edge Detection	x			Gradient and Laplacian. Discrete approximations. Canny Edge Detector. Edge sharpening	1,66	6,5
	10	Lab Session 4: Filtering		x	Lab 40B01A	Low-pass filters. High-pass filters. Gaussian Filters. Statistical ordered filters	1,66	

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6	11	Partial exam #1. Image Restoration	x			Partial exam #1. Introduction to Image Restoration. Noise. Linear distortion. Noise and linear distortion	1,66	6,5
	12	Lab Session 5: Template Matching		x	Lab 40B01A	Template Matching	1,66	
7	13	Segmentation (1)	x			Threshold-based segmentation	1,66	6,5
	14	Lab Session 6: DFT and Filtering in the Frequency Domain		x	Lab 40B01A	DFT and DFT properties. Role of Phase and Magnitude. Filtering in the Frequency Domain	1,66	
8	15	Segmentation (2)	x			clustering-based segmentation. Region Growing and Splitting	1,66	6,5
	16	Lab Session 7: Edge Derection		x	Lab 40B01A	Edge detection	1,66	
9	17	Morphological Image Processing. Hough Transform	x			Basic morphological operators. Hough transform	1,66	6,5
	18	Lab Session 8: Segmentation		x	Lab 40B01A	Threshold- and clustering-based segmentation	1,66	
10	19	Classification Methods	x			Learning by example paradigm. K-NN. Linear classifiers. Linear SVMs	1,66	6,5
	20	Lab Session 9: Morphological Image Processing. Hough Transform		x	Lab 40B01A	Morphological Image Processing. Hough Transform	1,66	
11	21	Partial exam #2. Image Descriptors (1)	x			Partial exam #2. Shape descriptors	1,66	6,5
	22	Lab Session 10: Classification Methods		x	Lab 40B01A	Image classification	1,66	
12	23	Image Descriptors (2)	x			Region descriptors. Notions of detectors and descriptors	1,66	6,5
	24	Lab Session 11: Final Project (1)		x	Lab 40B01A	Final Project (1)	1,66	
13	25	Introducion to CNNs and their Applications in Image Processing	x			Introducion to CNNs	1,66	6,5
	26	Lab Session 12: Final Project (2)		x	Lab 40B01A	Final Project (2)	1,66	
14	27	Introducion to CNNs and their Applications in Image Processing	x			Applications of CNNs in Image Processing	1,66	6,5
	28	Lab Session 13: Final Project (3)		x	Lab 40B01A	Final Project (3)	1,66	
	29	Additional session. Lab Session 14: Final Project (4)		x	Lab 40B01A	Final Project (4)	1,66	3,25
Subtotal 1							48	94

Total 1 (Hours of class plus student homework) 142

15		Tutorials, handing in, etc					3,6	-
16								

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17		Assessment					4	10
18								
Subtotal 2							8	10
<i>Total 2 (Hours of class plus student homework)</i>							18	

TOTAL (<i>Maximun 160 horas</i>)	160
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