

MÓDULO	MATERIA	CURSO	SEMESTRE	CRÉDITOS	TIPO
	Image Analysis and Processing		1º	5	Mandatory
PROFESORES*			DIRECCIÓN COMPLETA DE CONTACTO PARA TUTORÍAS (Dirección postal, teléfono, correo electrónico, etc.)		
José Antonio Diaz Navas Rafael Huertas Luis Gómez Robledo (University of Granada)			http://directorio.ugr.es/static/Personal/*/jadianz_at_ugr.es http://directorio.ugr.es/static/Personal/*/rhuertas_at_ugr.es		
			HORARIO DE TUTORÍAS*		
			Martes, miércoles y jueves, de 8 a 10 horas (Profesor YYYY) y de 10 a 12 horas (Profesor XXXX)		
MASTER EN EL QUE SE IMPARTE					
Máster EM Color in Informatics and Media Technology CIMET					
PRERREQUISITOS Y/O RECOMENDACIONES (si procede)					
scientific graduate level. Matlab/C++ basic knowledge					
BREVE DESCRIPCIÓN DE CONTENIDOS (SEGÚN MEMORIA DE VERIFICACIÓN DEL GRADO)					
This course is a graduate-level introductory course to the fundamentals of digital image processing and analysis. It emphasizes general principles of image processing, rather than specific applications. We expect to cover topics such as digital image definition, basic transformations, sampling and quantization, point operations, linear image filtering, transforms and histogram processing, spatial, frequency and nonlinear filtering, image segmentation, texture analysis, color representations and spaces, image restoration, simple feature extraction and recognition tasks.					

* Consulte posible actualización en Acceso Identificado > Aplicaciones > Ordenación Docente.



COMPETENCIAS GENERALES Y ESPECÍFICAS

Programming assignments will use MATLAB and the MATLAB Image Processing Toolbox, though the use of other computer languages and/or software packages will be accepted.
Additional seminars will be organized to introduce specific tools or applications to enlarge the covering of image processing and analysis (compression, reconstruction, wavelets and multiresolutions approaches, ...).

OBJETIVOS (EXPRESADOS COMO RESULTADOS ESPERABLES DE LA ENSEÑANZA)

TEMARIO DETALLADO DE LA ASIGNATURA

Topics to be taught (may be modified):

- Introduction and overview of image processing; Image formation & sensing; sampling & quantization; pixel connectivity; digital images format
- Arithmetic/logic operations; 1-D image processing; gray level transformations
- Histogram processing; equalization, thresholding, gray level transformation
- Spatial filtering; smoothing; sharpening; Laplacian; gradient and other derivative filters
- Filtering in the frequency domain; lowpass filters; highpass and other filters; Fourier transform
- Image restoration; noise reduction using spatial filters; adaptive filtering; noise reduction using frequency domain techniques; image degradation; inverse filters
- Point, line and edge detectors; operators
- Image segmentation; region growing; region splitting and merging; region adjacency graph
- Color images; color spaces; color space transformations; pseudocolor transformations; Color image transformations and color image processing
- Image analysis; texture analysis; features extraction; shape descriptors
- Pattern recognition; template matching; correlation; graph matching; objects recognition

Practical Laboratory Sessions:

Matlab/C++ laboratory topics in order to implement and master basic issues explained in the lectures.

BIBLIOGRAFÍA

Reference book:

Digital Image Processing, 3rd Edition (DIP/3e), by Rafael C. Gonzalez and Richard E. Woods, Prentice Hall (2008)

Additional textbook:

Color Image Processing: Methods and Applications (Image Processing), by Rastislav Lukac & Kostantinos N. Plataniotis, CRC (2006)

The Image Processing Handbook, Fifth Edition (Image Processing Handbook), by John C. Russ, CRC (2006)



Image Processing: Analysis and Machine Vision by Sonka, V and Hlavac and R.Boyle, 3rd edition, Thomson (2008)

ENLACES RECOMENDADOS

METODOLOGÍA DOCENTE

Teaching methods: Lectures and lab classes, and homework exercises.

EVALUACIÓN (INSTRUMENTOS DE EVALUACIÓN, CRITERIOS DE EVALUACIÓN Y PORCENTAJE SOBRE LA CALIFICACIÓN FINAL, ETC.)

50% for Final exam and 25% exercises and 25% project work.

INFORMACIÓN ADICIONAL



ugr

Universidad
de Granada

Página 3

INFORMACIÓN SOBRE TITULACIONES DE LA UGR
<http://grados.ugr.es>