Last update: 06-05-2019

230323 - IPER - Pigment Identification with Raman Spectroscopy

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering

Teaching unit: 739 - TSC - Department of Signal Theory and Communications

Academic year: 2019

Degree: BACHELOR'S DEGREE IN TELECOMMUNICATIONS SCIENCE AND TECHNOLOGY (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN TELECOMMUNICATIONS SYSTEMS ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN NETWORK ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Optional)
BACHELOR'S DEGREE IN ELECTRONIC SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional)

ECTS credits: 2 Teaching languages: Spanish

Teaching staff

Coordinator: Sergio Ruiz Moreno

Others: Sergio Ruiz Moreno

Prior skills

First course completed

Teaching methodology

Class room and laboratory

Learning objectives of the subject

Experimentation of the new optical communications technologies applied to the pigment analysis

Study load

Total learning time: 50h	Hours large group:	12h	24.00%
	Hours small group:	8h	16.00%
	Self study:	30h	60.00%

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Content

Pigment identification with Raman spectroscopy: Application of the laser to the investigation and conservation of artworks	Learning time: 20h Laboratory classes: 12h Guided activities: 8h

Description:
? Scientifical methodologies in conservation, restoration, datation and catalogation of artworks
? Pulsed lasers (IR and UV) in the conservation of the cultural heritage (laser cleaning)
? CW laser and Raman spectroscopy: molecular information (the Raman effect)
? Modern systems of Raman spectroscopy with optical fiber: direct and non destructive identification of pigments
? Fundamental parameters in Raman analysis
? Noise and interferences in a Raman spectrum: SNR optimization
? Differentiation between natural and synthetic pigments
? Spectral identification in mixtures of pigments
? Experiences with the Cultural Heritage at the UPC
? Evaluation

Related activities:
Raman in Art Laboratory

Qualification system

Experimental tasks and continous evaluation

Bibliography