

Course guide

230323 - IPER - Pigment Identification with Raman Spectroscopy

Last modified: 25/05/2023

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 739 - TSC - Department of Signal Theory and Communications.

Degree: BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Optional subject).
BACHELOR'S DEGREE IN ELECTRONIC ENGINEERING AND TELECOMMUNICATION (Syllabus 2018). (Optional subject).

Academic year: 2023 **ECTS Credits:** 2.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: Consultar aquí / See here:
<https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura>

Others: Consultar aquí / See here:
<https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma>

PRIOR SKILLS

Basic knowledge in Mathematics and Physics

TEACHING METHODOLOGY

Class room (16h) and laboratory (4h)

LEARNING OBJECTIVES OF THE SUBJECT

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

STUDY LOAD

Type	Hours	Percentage
Hours large group	12,0	24.00
Self study	30,0	60.00
Hours small group	8,0	16.00

Total learning time: 50 h

CONTENTS

Pigment identification with Raman spectroscopy: Application of the laser to the investigation and conservation of artworks

Description:

- ? Scientific 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

Full-or-part-time: 20h

Laboratory classes: 12h

Guided activities: 8h

GRADING SYSTEM

Class attendance (60%) and delivery of a proposed work (40%)