

Guía docente

220144 - 220144 - Uav Sensores y Aplicaciones

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Unidad responsable: Escuela Superior de Ingenierías Industrial, Aeroespacial y Audiovisual de Terrassa
Unidad que imparte: 220 - ETSEIAT - Escuela Superior de Ingenierías Industrial y Aeronáutica de Terrassa.

Titulación: GRADO EN INGENIERÍA EN TECNOLOGÍAS AEROESPACIALES (Plan 2010). (Asignatura optativa).
GRADO EN INGENIERÍA EN VEHÍCULOS AEROESPACIALES (Plan 2010). (Asignatura optativa).

Curso: 2021 **Créditos ECTS:** 3.0 **Idiomas:** Inglés

PROFESORADO

Profesorado responsable: Manel Soria

Otros:

METODOLOGÍAS DOCENTES

OBJETIVOS DE APRENDIZAJE DE LA ASIGNATURA

To understand how different types of imaging sensors operate (RGB cameras, multispectral cameras, hyperspectral cameras) and how they can be used to gather useful information about the environment.

To obtain a panoramic of the current applications of UAVs for civilian applications.

To acquire a hands-on experience reading and post-process UAV data.

HORAS TOTALES DE DEDICACIÓN DEL ESTUDIANTE

Tipo	Horas	Porcentaje
Horas grupo grande	30,0	40.00
Horas aprendizaje autónomo	45,0	60.00

Dedicación total: 75 h

CONTENIDOS

Module 1: Introduction to imaging sensors

Descripción:

The fundamentals of image sensors will be described. The sensors to be described include monochrome cameras, color (RGB) cameras, multispectral cameras, hyperspectral cameras and thermal imaging cameras.

Dedicación: 25h

Grupo grande/Teoría: 10h

Aprendizaje autónomo: 15h

Module 2: Introduction to image processing for UAV applications

Descripción:

Digital representation of images. Data types used for image representation. Loosely compressed and non-compressed image formats. Monochrome and color images. Contrast enhancement algorithms. RGB and HSV images. Processing of multispectral and hyperspectral images. Binary images. Morphological image processing. Image segmentation. Image registration. Application examples.

Dedicación: 25h

Grupo grande/Teoría: 10h

Aprendizaje autónomo: 15h

Module 3: Guided project

Descripción:

The students will select the subject of their project in agreement with the professor. It will be based on a UAV imaging system (including spacecraft images). The students creativity in the selection of a project will be encouraged.

Some examples of possible bibliographic works are:

- Processing of spacecraft RAW images.
- Band-pass filters for multispectral imaging systems

Some examples of possible practical projects are:

- Characterization of a micro UAV camera
- Segmentation of planetary images
- Tracking of objects in a video

The students will work in groups. Each group will submit a report of the project, as well as a video presentation of their work.

Dedicación: 25h

Grupo grande/Teoría: 10h

Aprendizaje autónomo: 15h

SISTEMA DE CALIFICACIÓN