Earth Observation Data Processing

Academic Year: (2022 / 2023) **Review date: 02/07/2021 11:11:04**

Department assigned to the subject: Signal and Communications Theory Department

Coordinating teacher: SOTO SANTIAGO, LUCIA

Type: Electives ECTS Credits : 3.0

Year : 2 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Remote Sensing and Scientific Missions (18093)

OBJECTIVES

Basic competences:
- Programming in Python
- Working in a Linux environment
- English. Middle level for written and high level for comprehension (minimum).
- Basic math

Specific skills:
- Numerical calculus applied to programming
- Understand and apply the physics of an optical instrument
- Understand and follow an algorithm document (ATBD)
- Implementation of the algorithms of an optical sensor
- Delivery of a Validation Report

DESCRIPTION OF CONTENTS: PROGRAMME

1. Optical instrument modelling
Optical phase: PSF, ISRF
Detection phase
Electronic phase
Noises
2. Processing and correction of data
Offset and Gain
Calibration
3. Geometry

LEARNING ACTIVITIES AND METHODOLOGY

Two teaching activities are proposed: lectures and practical sessions.

LECTURES AND EXAMPLES (2 ECTS)
Lectures will be delivered using the blackboard, with slides or by any other means to illustrate the concepts to be learnt. In these classes the explanation will be completed with examples. In these sessions the student will acquire the basic concepts of the course. It is important to highlight that these classes require the initiative and the personal and group involvement of the students (there will be concepts that the student himself should develop).

PRACTICAL SESSIONS (1 ECTS)

The practical classes will solve practical cases as well as laboratory sessions in which real and synthetic data sets will be analysed.

Basic concepts learnt during the course are applied in the laboratory and by means of simulation. The student should participate actively the exercise implementation; the level of the student involvement in this work grows from the first exercise to the last one where the student will be encouraged to propose and solve the problem.

ASSESSMENT SYSTEM

% end-of-term-examination/test:	0
% of continuous assessment (assigments, laboratory, practicals…):	100

All of the subject is evaluated continuously.

The subject expects the students to implement a number of algorithms defined in the subject's ATBD (provided to the students).
Those algorithms shall be tested with reference data and compared to output reference data.
The results shall be reported in the Validation Report (template provided to the students).
Deliverables and weights in the CONTINUOUS ASSESSMENT:
- Source code (30%)
- Output data (5%)
- Validation Report (65%)

The deliverable shall be delivered as a maximum at the end of the course. Nevertheless, the students will be motivated to do intermediate deliveries.