

Code: 1349 Remote Sensing and Image Analysis**Degree:** 2nd cycle – Agriculture; Forestry and Natural Resources**Stream:** Agriculture – Agricultural Engineering; Forestry and Natural Resources - all**Curricular Year:** 1st (FNR) / 2nd (Agr)**Semester Course:** 1st**Credits:** 6 ECTS**Compulsory** (Forestry and Natural Resources)**Language:** Portuguese/English**Optional** (Agriculture)**Responsible:** José Miguel Oliveira Cardoso Pereira**Other lecturer(s):** -**Web Site:** <http://www.isa.utl.pt/home/node/3813>**1. Contact hours:****Lecture/Practicals 70 Others 14 Total 84****2. Objectives:**

Develop competences for qualitative classification and quantitative analysis of imagery from the main Earth Observation satellites, using data with spatial resolution ranging from 1m to 1km. Emphasis on land cover classification / change monitoring, namely those induced by fire and harvesting. Analysis of vegetation dynamics using vegetation indices.

3. Programme:

Introduction to the raster structure of multispectral data. Spatial, radiometric, spectral and temporal resolution. Quantitative characterization and image visualization. Contrast enhancement and filtering. Pre-processing: radiometric correction and DN-to-reflectance conversion. Geometrical correction. Main methodologies for the correction of atmospheric effects. Spectral signatures. Main algorithms for supervised and unsupervised classification: ISODATA, k-means, maximum likelihood, classification trees. Accuracy assessment. Chance detection and time series analysis. Vegetation indices: generic concept and specialized indices. Minimization of disturbances induced by the atmosphere and soil background.

4. Bibliography:**Main Bibliography**

Jensen, J.R. (1996) Introductory Digital Image Processing – A Remote Sensing Perspective. Prentice Hall, NJ

Other Bibliography

Chuvieco, E. (1996, 3rd Ed.) Fundamentos de Teledetección Espacial. RIALP, Madrid.

5. Assessment:

Mid-term test

Final exam

Computer lab practical exercises

6. Estimated Workload:

168

Hours

7. Last Update:

19/7/2010