



## Remote sensing of the environment: a practical course

**Lecturer(s) or Responsible(s):** Maria Alexandra Oliveira (CE3C, FCUL), Adriana Príncipe Silva (CE3C, FCUL), João Nuno Silva (INESC-ID/IST), Pedro Pinho (CE3C, FCUL), Inês Domingues (CE3C, FCUL), Mariana Ramos (CE3C, FCUL)

**Calendar:** 27-31 January 2025

**Duration:** 36 hours (contact hours)

**Schedule:** 9h-12h30; 14h-17h30 Monday-Thursday; 9h-13h and 14h-18h Friday

**Objectives:** Remote sensing is becoming an invaluable tool extending data collection, both in space and time, to complement classical sampling strategies for both earth and biological sciences. This advanced course aims to provide access and tools to remote sensing data acquisition and processing for different applications using satellite, drone and terrestrial multispectral imagery and LiDAR, and focusing on characterizing the vegetation and landscape, and their changes in time.

### General Plan:

Day 1: theoretical introductions concerning remote sensing sensors (active and passive) and platform (satellite, drone, terrestrial). Data access platforms: available satellites and

products, Remote Sensing data visualization using web portals, data download and visualization.

Day 2: theoretical introduction and practical classes on programming using R and/or python to access, download and process remote sensing data.

Day 3: Morning: use cases showcasing work involving researchers from the cE3c that used remote sensing data. Afternoon: Practical session (eventually some field work nearby for data collection using terrestrial LiDAR, NDVI and multispectral cameras).

Day 4: Practical session for remote sensing data download and processing in areas of interest of the students (data is also available for students without study areas).

Day 5: Practical sessions and presentations from the students.

Participants have to be present at 85% of the contact hours (this means that they can miss one half-day), and actively participate in all activities.

This course can give credits to PhD programmes at FCUL or of programmes with partnership from FCUL and other institutions with 6h-7h of contact hours per ECT, as a function of specific requirements. **For these students additionally to the exercises done during the week the delivery of a written report done after the course is mandatory.** For programmes with less hours of contact per ECT (6h/ECT, getting 6 ECTs from the course) students need to do an additional assignment (summary report). If needed 1 or 2 additional hours of contact may be added. Such report(s) are also advised for other students requesting creditation of the course in their institutions.

**Location:** FCUL

**Nº (min, max) students:** 10 – 20

**Directed to:** MSc or PhD students in Biology, Geology, Environmental Sciences, Ecology or related areas, postdocs and professionals working in related topics.

**Minimal formation of students:** Bachelor's degree in Earth Sciences, Biology, Natural Science, or related areas. Basic programming skills (python/R) and knowledge on geospatial data processing.

**Fee:** Free for 1st year PhD students in Doctoral programmes at FCUL (e.g. Biologia, Geologia), Biodiversity, Genetics and Evolution (BIODIV UL; UP), Biology and Ecology of Global Changes (BEAG UL, UA) and Sustainability Science (UL, several institutions), when the course counts credits for their formation, in which case the delivery of a final report done after the course is mandatory; the course is also free for more advanced PhD students of the BIODIV programme (ULisboa or UPorto); 50 € for more advanced PhD students of cE3c; 70 € for PhD students of the PEERS network (CFE); 125 € for FCUL Master students and unemployed; 180 € for BTI, BI and other PhD students; 250 € for Professional and postdocs.

When the maximum number of students is reached, 10 vacancies will be available for non-paying 1st year PhD students mentioned above, being, by order of preference students from: 1) cE3c; 2) BIODIV (not from cE3c); 3) FCUL (not from cE3c); 4) Sustainability Science (not from cE3c or FCUL); 5) BEAG (not from cE3c or FCUL).

**Deadline for applications:** December 20 2024

## **How to apply**

Candidates should fill in a FORMULARY that will be available after the call is open.

This formulary is strictly confidential, as explained in the introduction, and the data are required because the cE3c Advanced Courses are also offered as part of the PRR programme of FCUL.

When filling the formulary mind to:

- 1) FILL ALL THE MANDATORY FIELDS
- 2) UPLOAD CV AND MOTIVATION LETTER, both mandatory; use the names as instructed there
- 3) If you want to resume later SAVE the formulary, otherwise you will need to fill everything again
- 4) At the end SUBMIT the formulary before exiting

For any doubts please contact the cE3c coordinator of the cE3c courses Margarida Matos ([mmmatos@fc.ul.pt](mailto:mmmatos@fc.ul.pt)) or the teacher Maria Alexandra Oliveira ([maoliveira@fc.ul.pt](mailto:maoliveira@fc.ul.pt))