



## Museum Techniques in the 21st Century

**Lecturer(s) or Responsible(s):** Ricardo Jorge Lopes (CE3C, FCUL), Judite Alves (CE3C, MUHNAC), Pedro Andrade (MUHNAC)

**Calendar:** 14-18 July 2025

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

**Schedule:** 9h-12h30 and 14h-18h, Monday-Friday

### Objectives:

This course aims to provide an updated vision of the potential of museum collections for biodiversity research. More specifically aims to:

- 1) present case studies on the value of museums and the use of collections and specimens in the 21st century, using new technologies and analytical methods. These include, among others:

- a) discuss 'whole specimen' techniques;
  - b) consider how museum specimens provide genetic and genomic resources;
  - c) present non-genetic molecular methods (e.g., stable isotopes, toxicology and quantification of color);
  - d) understand the potential of the spatial and temporal data gathered along with the specimen, especially when made available in global repositories;
- 2) present the ways that 'voucher specimens' of vertebrates are prepared;

### General Plan:

<b>Monday</b>	<b>09:00</b>	<b>Value of museums in the 21st century</b> - <i>the use of Biological collections</i> - <i>the principle of the "extended specimen"</i> - <i>current methods for preparing specimens</i>
	<b>10:30</b>	<b>Invited lectures</b> <i>"whole specimen" examples, including CT scanning and 3D models</i>
	<b>14:00</b>	<b>Practical</b> <i>digital vouchers, photogrammetry and 3D printing</i>
<b>Tuesday</b>	<b>09:00</b>	<b>Museum specimens as a genetic and genomic resources</b>
	<b>10:30</b>	<b>Invited lectures</b> <i>examples on the use of genetic data from museum specimens</i>
	<b>14:00</b>	<b>Practical</b> <i>preparing voucher specimens (Birds)</i>
<b>Wednesday</b>	<b>09:00</b>	<b>Museum specimens as a resource for non-genetic molecular analysis</b>
	<b>10:30</b>	<b>Invited lectures</b> <i>examples on the use of non-genetic molecular analysis data from museum specimens</i>
	<b>14:00</b>	<b>Practical</b> <i>preparing voucher specimens (Mammals)</i>
<b>Thursday</b>	<b>09:00</b>	<b>Museum specimen's data as a resource for biodiversity analysis</b>
	<b>10:30</b>	<b>Invited lectures</b> <i>examples on the use of museum data for biodiversity analysis</i>
	<b>14:00</b>	<b>Practical</b> <i>data validation for public repositories and data retrieval</i>
<b>Friday</b>	<b>09:00</b>	<b>Practical</b> <i>preparing voucher specimens (Fluid preservation)</i>
	<b>14:00</b>	<b>Visit</b> <i>MUHNAC collections - types of specimens and storage</i>

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:** Museu Nacional de História Natural e da Ciência (MUHNAC)

**Specific needs (e.g. computers, lab):** Taxidermy and general lab facilities.

**Nº (min, max) students:** 10-15

**Directed to:** Students interested in the preservation and use of biological specimens.

**Minimal formation of students:** Bachelor in Biological and Natural Sciences or related areas

**Fee:** Free for 1st year PhD students in Doctoral programmes at FCUL (e.g. Biologia), 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:** 15 June, 2025

## 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 course coordinator, Ricardo Jorge Lopes ([rjlopes@ciencias.ulisboa.pt](mailto:rjlopes@ciencias.ulisboa.pt))