Sanisera Archaeology Institute for International Field Schools

Course 060: LiDAR, Photogrammetry, GIS and Claude AI to Discover Archaeological Sites in the Pyrenees

Course Syllabus · 2027 season

Course ID	SAI 060 · LiDAR, Photogrammetry, GIS and AI in the Pyrenees
Country / Location	Spain · Malpàs (El Pont de Suert, Lleida), Catalan and Aragonese Pyrenees
Dates	July to September 2027 (4 sessions of 16 days)
Duration	16 days per session
Instructional hours	80 hours: 9 days x 7.5 h of field reconnaissance and laboratory + museum day + report day (about 6 h each)
Recommended credit equivalence	4 semester credits (reference scale: about 20 instructional hours per semester credit; 80 h = 4, 100 h = 5, 120 h = 6). Credit is awarded by the student's home institution; see section 12.
Level / Prerequisites	Introductory / intermediate. No previous knowledge of archaeology or of the software is required.
Language of instruction	English
Maximum enrolment	6 students per session
Tuition	from USD 2,600 per session (see section 14)
Instructors	Fernando Contreras Rodrigo (Course Director); Adrián Fernández Sánchez (Instructor in GIS and remote sensing); Esther Fernández Colomo (GIS analyst and instructor)
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1. Program description

A landscape-archaeology course on the medieval Pyrenees, the area of Spain with the highest density of Romanesque sites of the 10th to 14th centuries: churches, monasteries, castles, abandoned villages and rock-cut necropolises. Within 70 minutes of the base at Malpàs, 37 sites and 20 abandoned villages have been inventoried for study.

Students learn to locate, assess and document archaeological sites with current digital techniques: LiDAR processing, drone photogrammetry, GNSS positioning, GIS (QGIS or ArcGIS) and the Claude AI assistant for the organisation and analysis of data. Each day combines field reconnaissance of one or more sites with laboratory processing of the data collected, and the course ends with a report on the viability of each site for future survey or excavation. A visit to the Romanesque collection of the Museu Nacional d'Art de Catalunya (Barcelona) and to monuments of the Vall de Boí (UNESCO World Heritage) is included.

2. Course objectives

- To teach the location of archaeological sites from historical, administrative and online sources.
- To train students in field reconnaissance and assessment of medieval sites.
- To teach LiDAR processing, drone photogrammetry, GNSS and GIS applied to heritage documentation.
- To introduce the use of AI tools in the management and analysis of archaeological data.
- To produce a professional viability report for future research.

3. Learning outcomes

On successful completion of the course, students will be able to:

- Locate potential sites from heritage inventories, historical cartography and online repositories.

- Assess a medieval site in the field (architecture, preservation, functional areas, access, signs of a necropolis).
- Fly a documentation mission with a drone (under supervision) and take GNSS coordinates.
- Produce orthophotos and 2D/3D photogrammetric models from drone images.
- Process LiDAR data and interpret anomalies; ground-truth them in the field.
- Build a GIS project with the archaeological map and its information layers.
- Write a study diary and a viability report, and present it orally.

4. Course format and instructional hours

The course lasts 16 days: 9 days of field reconnaissance and laboratory work, 1 day of museum and monument visits, 1 day for the preparation of the personal report and presentation, 2 travel days (Barcelona airport transfer) and 3 rest days. The working day is 7.5 hours: 5.5 in the field (sites studied in sessions of 30 to 120 minutes) and 2 in the laboratory processing the day's data. Instructional hours: 11 days (9 x 7.5 h field/lab + museum day + report day) = approx. 80 hours.

Total instructional hours: 80 hours. This figure appears on the Certificate of Completion and on the Student Evaluation Report.

5. Course schedule

Indicative daily schedule; the order of activities may change according to weather, site conditions and research needs.

Day	Activities
Day 1	Transfer from Barcelona airport to Malpàs. Orientation, Code of Conduct, hand-out of journal and site record forms.
Days 2-4	Lecture: the medieval Pyrenees and the Romanesque. Documentary sources and site location. Field reconnaissance of the first sites; drone and GNSS; lab: GIS project set-up, LiDAR data acquisition.
Day 5	Rest day.
Days 6-9	Field reconnaissance (2-3 sites per day) with drone photogrammetry; lab: photogrammetric processing, LiDAR interpretation, Claude AI data handling. Review of journals and record forms.
Day 10	Visit to the Romanesque churches of the Vall de Boí (UNESCO) and to the MNAC collection in Barcelona (or regional museums).
Day 11	Rest day.
Days 12-13	Field reconnaissance and ground-truthing of LiDAR anomalies; lab: completion of the GIS project.
Day 14	Preparation of the viability report and of the final presentation (laboratory).
Day 15	Final presentations, assessment and certificates. Rest afternoon.
Day 16	Transfer to Barcelona airport. Departure.

6. Assessment and grading

Students complete three assignments during the course, in addition to daily supervised work: a daily field journal, the course's recording sheets and a final presentation. The final grade is calculated as follows:

Component	Weight	Description
Field / laboratory participation and professional conduct	40 %	Daily assessment by the instructors of engagement, technique, care of the record and of the finds, teamwork and compliance with the Code of Conduct.
Daily field journal	20 %	A written entry for every instructional day describing the work carried out, the methods applied, the contexts or materials handled and the student's own observations. Reviewed weekly.
Recording sheets	20 %	Site record forms (one per site visited) and the GIS attribute tables; study diary. Assessed for accuracy, completeness, terminology and legibility.
Final presentation	20 %	A 10-minute PowerPoint presentation, delivered on the last

Component	Weight	Description
		instructional day, on the viability report of one of the sites studied by the student, followed by questions.

Grading scale

Letter grade	Percentage
A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D	60-69
F	below 60

Grades are recorded as a percentage and as a letter grade on the US scale above. Students who request it receive a Student Evaluation Report signed by the Course Director, with the breakdown of the grade, the attendance record and the instructional hours completed, for submission to their home institution. The Institute does not itself award academic credit.

7. Attendance policy

Attendance at all scheduled instructional activities is compulsory. A minimum attendance of 85 % of the instructional hours is required to pass the course and to receive the Certificate of Completion. Absences for documented illness or injury are excused but still count towards the 85 % threshold; unexcused absences lower the participation grade. Students who leave the course early receive a certificate stating only the hours actually completed.

8. Prerequisites and who should apply

None. Own laptop compulsory. Ability to walk 15-20 minutes on mountain paths. Minimum age 18.

9. Instructors

Fernando Contreras Rodrigo — Course Director. Licenciatura in History, specialisation in Classical Archaeology (Autonomous University of Barcelona). Five-year degree officially recognised in Spain at Master's level (MECES 3). Director of the Sanisera Archaeology Institute; since 1993 he has directed research, conservation and heritage-management projects in Spain, Italy and the United Arab Emirates, and since 2015 annual excavation and restoration missions for the Government of Dubai. Author of more than thirty publications and reports.

Adrián Fernández Sánchez — Instructor in GIS and remote sensing. PhD in Climatology and flood hazards; degree in Geography (2014). Professor of Remote Sensing at the Complutense University of Madrid. Has worked with Sanisera since 2018 in Carthage (Tunisia), Dubai (UAE), Menorca and Saudi Arabia; supervisor of Master's theses on LiDAR detection of archaeological remains and geostatistics.

Esther Fernández Colomo — GIS analyst and instructor. Archaeologist specialised in Geographic Information Systems (Complutense University of Madrid), trained in drone photogrammetry and machine learning applied to GIS. GIS technician for the Sanisera Archaeology Institute in Dubai (2025-2026); co-author of three scientific publications.

10. Equipment and what to bring

- Own laptop (compulsory); software (QGIS) is free, ArcGIS course licences provided.
- Hiking boots, rain jacket, hat, sunscreen, water bottle.
- Notebook for the diary; passport; health insurance.

11. Travel and meeting point

Fly to Barcelona (BCN). Transfer from Barcelona airport to Malpàs on Day 1 and back on Day 16 is included; the meeting time at the airport is sent after registration.

Students arriving from outside the Schengen area should check whether they need a visa; the Institute issues the letter of invitation required for the application. US, Canadian, UK and Australian citizens do not need a visa for stays of up to 90 days in Spain; they will need the EU ETIAS travel authorisation once it comes into force (no start date has been fixed yet; the Institute will inform admitted students). If a Schengen visa is refused, everything paid is refunded in full on presentation of the official refusal document.

12. Academic credit and transcript

The Sanisera Archaeology Institute is an independent, non-profit institution and does not award academic credit directly. Students who wish to receive credit for this course should obtain pre-approval from their department or study-abroad office before the course begins, using this syllabus. On completion, the Institute issues a Certificate of Completion stating the course, dates, instructional hours and final grade, and, on request, a detailed Student Evaluation Report. Students from universities in the United States, Canada, the United Kingdom and Australia have regularly obtained credit for Sanisera courses in this way: students from more than 40 universities have done so (see the list on the Institute's website). The Institute is currently working towards a School of Record agreement with a US accredited institution for the issue of official transcripts.

13. Code of conduct and safety

All students and staff are bound by the Institute's Code of Conduct and Anti-Harassment Policy, available on the website, which applies at the site, in the laboratory, in the accommodation and during free time. A safety briefing is given on the first day; students may decline any activity they consider unsafe. Serious breaches of the Code may lead to removal from the course without refund. Accident insurance at the site is included; students are responsible for their own health and travel insurance.

14. Dates, tuition and what is included

Session	Dates 2027	Tuition (USD)
1	14-29 July	$ 2,600
2	1-16 August	$ 2,600
3	19 August - 3 September	$ 2,600
4	6-21 September	$ 2,600

Tuition includes

- Tuition and teaching.
- Transfer Barcelona airport - Malpàs - Barcelona airport.
- Daily transport to the sites (minibus and 4x4).
- Accident insurance for the fieldwork.
- Visit to the MNAC (Barcelona) and to museums and Romanesque sites of the Pyrenees.

- Accommodation in the Malpàs apartment (shared rooms, maximum three people of the same sex, wifi, air conditioning, pool).
- Certificate of completion and, on request, the Student Evaluation Report.
- Letter of invitation for the Schengen visa, if required.

Not included

- Airfare to/from Barcelona.
- Meals (budget approx. EUR 23 per day).

Payment. A deposit of USD 450, which is part of the tuition and is deducted from the total, reserves the place and is due within five days of admission; the balance is due 60 days before the session begins. Payment plans are available on request. The Institute does not offer scholarships or discounts.

Refund policy. If the student cancels, only the USD 450 deposit is refunded, and only if the refund is requested within 20 days of paying it; the balance is not refundable, but everything paid can be converted into credit for any course in the current year or the following season. Everything paid is refunded in full if the Institute cancels the session or if the student's Schengen visa is refused (official refusal document required). Places are not transferable. Full text: Terms and Conditions of Payment on the website.

15. Recommended readings

Recommended, not required. Readings are available in the Institute's library during the course.

- Opitz, R. S. & Cowley, D. C. (eds.) (2013). Interpreting Archaeological Topography: Airborne Laser Scanning, 3D Data and Ground Observation. Oxford: Oxbow.
- Conolly, J. & Lake, M. (2006). Geographical Information Systems in Archaeology. Cambridge: Cambridge University Press.
- Historic England (2017). Photogrammetric Applications for Cultural Heritage: Guidance for Good Practice. Swindon: Historic England.
- Bango Torviso, I. G. (1992). El Románico en España. Madrid: Espasa Calpe.

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