



CONSERVATION & INTERPRETATION OF ARCHAEOLOGICAL METAL ARTIFACTS AT THE ISLAND OF ZAKYNTHOS (GREECE)

Course ID: HIS 489

June 1-14, 2025

Academic Credits: 4 Semester Credit Units (Equivalent to 6 Quarter Units)

School of Record: Culver Stockton College

This program provides breakfast only during teaching days. Students are responsible for all other meals. There are plenty inexpensive and mid-range local restaurants at Zakynthos that offer a typical three-course Greek meal.

DIRECTORS:

Assoc. Prof. Dr. Christos Karydis, Conservator & Associate Professor at Ionian University, Greece
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Dr. Adamandia Panagopoulou, Post-Doc Researcher at the Institute of Nanoscience & Nanotechnology “Demokritos” National Center for Scientific Research, Athens
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Dr. Angela Pencheva, Co-Founder of Balkan Heritage Foundation, Adjunct Professor at CPCE, New Bulgarian University (Bulgaria) & ICCM Board Member (balkanheritage@gmail.com)



INTRODUCTION

The program provides students with intensive training in ethnographic metal conservation. This program is designed for students who are considering a career in conservation and provides focused, in depth training for the study, conservation, preservation, mounting, and reconstruction of one type of ethnographic artifact – metals. This is a hands-on program, and we will cover both theory and practice of metal conservation.

Students will be guided through the history and technology of ecclesiastical, historical, and ethnographic metal objects and consequent stages of their study, conservation, and documentation. Students will explore the principles of material conservation, including methods and theories. To better understand structure and materials, students will learn how to use analytical instruments, including optical microscopy, X-Ray Fluorescence (XRF) and X-Ray Diffraction (XRD). Students will learn how to operate and interpret results. During the program, students will work with authentic objects and replicas of metal artifacts of various types and sizes.

This program focuses on metal object conservation. It will cover the following modules:

- Introduction to Chemistry for Conservators
- History of Ethnographic and Archaeological Metal Artifacts
- Construction Technology of Ethnographic and Archaeological Metal Artifacts
- Introduction to Interventive Conservation Treatments of Metal
- Conservation Techniques and Materials of Metal: 1) Iron; 2) Copper; 3) Copper Alloys
- Physicochemical Analyses of Metal: XRF, XRD & Raman analysis
- Preventive Conservation & Handling of Metal. Conditions and Materials of Storage or Exposure of Metal
- Environmental Conditions of Interventive or Preventive Conservation. Methods and Materials of in situ Conservation of Metal

This program takes place at the labs of the [Department of the Environment at the Ionian University](#), on the Greek Island of Zakynthos.

IMPORTANT DISCLAIMER

The Center for Field Sciences was established to support field training in a range of sciences at sites within the U.S. & across the world. Traveling and conducting field work involves risk. Students interested in participating in any CFS program must weigh the potential risk against the value of education provided by the program of their choosing.

Risk is inherent in everything we do and the CFS takes risks seriously. A committee of leading scholars review each field school location prior to approval. Once a program is accepted, the CFS continually monitor conditions at the program's site and so we can provide an experience that is as safe as possible.

The CFS does not provide trip or travel cancellation insurance. Students are encouraged to explore such insurance policies on their own. Post Covid 19, most basic policies do not cover trip cancellation due to pandemics. If you wish to purchase an insurance policy that covers such contingencies, explore Cancel for Any Reason (CFAR) plans. [Insuremytrip.com](https://www.insuremytrip.com), [Squaremouth.com](https://www.squaremouth.com) or [Travelguard.com](https://www.travelguard.com) are possible websites where students may explore different insurance policies.

Students should be aware that conditions in the field are different than those experienced at home, dorms or college towns. Students will be exposed to the elements, live in rustic accommodation, and expect to engage in daily physical activity.

We do our best to follow schedule and activities as outlined in this syllabus. Yet local permitting agencies, political, environmental, personal, and/or weather conditions may force changes. This syllabus, therefore, is only a general commitment. Students should allow flexibility and adaptability as research work is frequently subject to modification.

All students must consult medical professionals to ensure they are fit to participate in a CFS field program. CFS is not qualified to provide medical advice. For all other concerns, please consult with CFS staff members or program director(s) – as appropriate.

COURSE OBJECTIVES

By the end of the workshop the participants will:

- Be able to develop basic practical skills (depending on participant's initial level of qualification) in metal conservation treatment.
- Become acquainted with the basic methods of required documentation for the conservation of metal objects using graphic software, as well as photo documentation.
- Learn about the forms, types, traditions, and technology of manufacture of archaeological and ethnographic metal objects in the Eastern Mediterranean, from the Middle Age to the modern era.
- Get acquainted with different case studies for preventive conservation of metal objects.
- Meet professionals working in the areas of conservation in Greece.

LEARNT SKILLS

We are aware that many students may not seek academic careers but will pursue employment in the private sector. To that end, we are following the example set by Twin Cairns with their Skills Log Matrix™ (<https://twincairns.com/skills-log-matrix/>). Students will be trained in the following skills:

| Skill | Skill Definition |
|------------------------|--|
| Photography | Ability to take clear images of various features, artifact & soil colors at various light and field depth conditions |
| Artifact Conservation | Ability to expertly conserve, preserve & restore a broad range of artifact types |
| Artifact Documentation | Ability to measure, record, photograph and classify various artifact types in the lab |
| Artifact Processing | Understand how to assign artifacts to accepted cultural/geological spheres, across space (classification) & time (seriation) |
| Field Conservation | Ability to conduct initial field conservation and preservation of different artifact types, features & architecture |
| Data Recording | Ability to use printed or digital sheets to document & record field data |
| Archival Search | Ability to find & search various databases for records related to prior work/research done on cultural or natural heritage in the project area |
| Public Interpretation | Ability to understand site history and provide clear and coherent interpretation for the public |
| Report Writing | Ability to write technical reports in coherent language that follow both federal and state regulations and law |

SKILLS MATRIX LEVELS

The school instructors will evaluate the level each student achieved on the Twin Cairns Skills Log Matrix™ skills list provided above. Each skill will be graded on one of the following three levels:

Basic: Can perform the skill/task with some supervision.

Competent: Can perform the skill/task without any supervision.

Advanced: Can perform the skill/task and teach others how to do it.

COURSE SCHEDULE

The field school includes lectures & workshop. See below schedule of activity.

| WEEK 1 | | |
|----------------|--|---|
| Sunday | | |
| 08.00 – 10.00h | Breakfast | |
| | Optional visits of to the National Marine Park of Zakynthos. and the most popular beaches of the island. | |
| Monday | | |
| 07.50 – 09.00h | Breakfast | |
| 09.30 – 11.30h | Lecture 1: History of ethnographic and archaeological metal artefacts. Lecture 2: Construction technology of ethnographic and archaeological metal artefacts. | Dr. Adamantia Panagopoulou, (National Research Center, 'NCSR DEMOKRITOS', Greece) |
| 11.30 – 12.00h | Break | |
| 12.00 – 13.00h | Workshop 1: Documentation techniques of metal objects. | Dr. Adamantia Panagopoulou |
| 13.00 – 14.30h | Lunch break and free time | |
| 14.30 – 16.45h | Workshop 2: Introduction to interventive conservation treatments of metal. | Dr. Adamantia Panagopoulou |
| Tuesday | | |
| 07.50 – 09.00h | Breakfast | |
| 09.30 – 11:30h | Lecture 3: Conservation techniques and materials of metal (Fe). | Dr. Adamantia Panagopoulou |
| 11.30 – 12.00h | Break | |
| 12.00 – 13.00h | Workshop 3: Conservation techniques and materials of metal (Fe). Mechanical cleaning with solvents. | Dr. Adamantia Panagopoulou |
| 13.00 – 14.30h | Lunch break and free time | |
| 14.30 – 16.45h | Workshop 4: Conservation techniques and materials of metal (Fe). Attachment, Stabilization, Protection. | Dr. Adamantia Panagopoulou |
| Wednesday | | |
| 07.50 – 09.00h | Breakfast | |
| 09.30 – 11.30h | Lecture 4: Conservation techniques and materials of metal (Cu). | Dr. Adamantia Panagopoulou |
| 11:30 – 12:00h | Break | |
| 12.00 – 13.00h | Workshop 5: Conservation techniques and materials of Cu and Copper alloys. Mechanical cleaning with solvents. | Dr. Adamantia Panagopoulou |

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|------------------------|--|--|
| 13.00 – 14.30h | Lunch break and free time | |
| 14.30 – 16.45h | Workshop 6: Conservation techniques and materials of Cu and Copper alloys. Attachment, Stabilization. | Dr. Adamantia Panagopoulou |
| Thursday | | |
| 07.50 – 09.00h | Breakfast | |
| 09.30 – 11.30h | Visit to the Ecclesiastical Museum of Holy Monastery of St. Dionysios: Documentation & preventive conservation. | Dr. Adamantia Panagopoulou |
| 11.30 – 12:00h | Break | |
| 12.00 – 13.00h | Lecture 5: Non-Invasive Physicochemical analyses of metal OM, X-Rays, XRF, FCIR, Raman analysis. | Dr. Adamantia Panagopoulou |
| 13.00 – 14.30h | Lunch break and free time | |
| 14.30 – 16.45h | Workshop 7: Conservation techniques and materials of Cu and Copper alloys. Protection. | Dr. Adamantia Panagopoulou |
| Friday | | |
| 07.50 – 09.00h | Breakfast | |
| 09.30 – 11:30h | Lecture 6: Preventive conservation & handling of metal. Conditions and materials of storage or exposure of metal. | Dr. Adamantia Panagopoulou |
| 11:30 – 12:00h | Break | |
| 12.00 – 13.00h | Workshop 8: Preventive conservation & handling of metal. | Dr. Adamantia Panagopoulou |
| 13.00 – 14.30h | Lunch break and free time | |
| 14.30 – 16:45h | Final outcomes Presentations of students End of seminar | Dr. Adamantia Panagopoulou |
| Saturday-Sunday | | |
| Days off | | |
| WEEK 2 | | |
| Monday | | |
| 07.50 – 09.00h | Breakfast | |
| 09.30 – 11.30h | Lecture 1: History of ethnographic and archaeological metal artefacts. Lecture 2: Construction technology of ethnographic and archaeological metal artefacts. | Dr. Adamantia Panagopoulou, (National Research Center, 'NCSR DEMOKRITOS', Greece) |
| 11.30 – 12.00h | Break | |
| 12.00 – 13.00h | Workshop 1: Documentation techniques of metal objects. | Dr. Adamantia Panagopoulou |
| 13.00 – 14.30h | Lunch break and free time | |
| 14.30 – 16.45h | Workshop 2: Introduction to interventive conservation treatments of composite metals. | Dr. Adamantia Panagopoulou |
| Tuesday | | |
| 07.50 – 09.00h | Breakfast | |

| | | |
|------------------|--|----------------------------|
| 09.30 – 11:30h | Lecture 3: Introduction to interventive conservation treatments of composite metals. | Dr. Adamantia Panagopoulou |
| 11.30 – 12.00h | Break | |
| 12.00 – 13.00h | Workshop 3: Conservation techniques and materials of composite metals. Chemical cleaning. | Dr. Adamantia Panagopoulou |
| 13.00 – 14.30h | Lunch break and free time | |
| 14.30 – 16.45h | Workshop 4: Conservation techniques and materials of composite metals. Chemical cleaning. | Dr. Adamantia Panagopoulou |
| Wednesday | | |
| 07.50 – 09.00h | Breakfast | |
| 09.30 – 11.30h | Lecture 4: Introduction to interventive conservation treatments of composite metals. | Dr. Adamantia Panagopoulou |
| 11:30 – 12:00h | Break | |
| 12.00 – 13.00h | Workshop 5: Conservation techniques and materials of composite metals. Chemical cleaning. | Dr. Adamantia Panagopoulou |
| 13.00 – 14.30h | Lunch break and free time | |
| 14.30 – 16.45h | Workshop 6: Conservation techniques and materials of composite metals. Attachment, Stabilization. | Dr. Adamantia Panagopoulou |
| Thursday | | |
| 07.50 – 09.00h | Breakfast | |
| 09.30 – 11.30h | Visit to the Ecclesiastical Museum of Holy Monastery of St. Dionysios: Documentation & preventive conservation. | Dr. Adamantia Panagopoulou |
| 11:30 – 12:00h | Break | |
| 12.00 – 13.00h | Lecture 5: Invasive Physicochemical analyses of metal OM, XRF, SEM, XRD. | Dr. Adamantia Panagopoulou |
| 13.00 – 14.30h | Lunch break and free time | |
| 14.30 – 16.45h | Workshop 7: Conservation techniques and materials of composite metals. Gap fillings, Aesthetic restoration. | Dr. Adamantia Panagopoulou |
| Friday | | |
| 07.50 – 09.00h | Breakfast | |
| 09.30 – 11:30h | Lecture 6: Preventive conservation & handling of metal. Conditions and materials of storage or exposure of metal. | Dr. Adamantia Panagopoulou |
| 11:30 – 12:00h | Break | |
| 12.00 – 13.00h | Workshop 8: Conservation techniques and materials of composite metals. Protection. Preventive conservation & handling of metal. | Dr. Adamantia Panagopoulou |
| 13.00 – 14.30h | Lunch break and free time | |
| 14.30 – 16:45h | Final outcomes Presentations of students End of seminar | Dr. Adamantia Panagopoulou |
| Saturday | | |
| Departure | | |

ACADEMIC GRADING MATRIX

Students are required to participate in all components of the field school. Grades are determined as follows:

- ❖ **60% - Lab work:** Students will be assessed on the quality of their lab work (i.e., their ability to effectively use conservation methods and instruments to treat cultural artifacts). Students are expected to be able to link the lectures and readings to their laboratory work.
- ❖ **25% - Lab Records, demonstrated diligence and active participation:** Students are required to record their work in a notebook that must be submitted to the project at the end of the field school. The notebook must include scaled sketches, procedures and other notes taken while working on assigned objects.
- ❖ **15% - Attendance.**

ATTENDANCE POLICY

The required minimum attendance for the successful completion of the field school is 95% of the course hours. Any significant delay or early departure from an activity will be calculated as an absence from the activity.

An acceptable number of absences for medical or other personal reasons will not be considered if the student catches up on the field school study plan through additional readings, homework, or tutorials with program staff members.

PREREQUISITES

There are no prerequisites for participation in this field school but note that conservation work requires good manual dexterity skills and ability to carry out delicate bench work. Students will receive hands-on training in conservation work and will spend most of the time learning how to conserve metal objects in a lab setting.

Students will be taught how to use a variety of laboratory procedures and equipment – from microscopes to analytical instruments. Conservation work is slow and may be tedious. It requires patience and focus. This is an intensive course so we will cover basic and advanced elements of conservation of archaeological and ethnographic metal objects.

PROGRAM ETIQUETTE

Greece, a land steeped in myth and history, is a captivating blend of ancient heritage and modern allure. From the birthplace of democracy in Athens to the legendary temples of Olympia and Delphi, Greece is a living museum showcasing the achievements of past civilizations. Its vibrant culture, with its rich traditions, delicious cuisine, and warm hospitality, captivates visitors from around the globe. Whether exploring its archaeological wonders, soaking in the Mediterranean sun, or indulging in its vibrant nightlife, Greece offers an unforgettable experience. Greek people take pride in their heritage and achievements, and we kindly ask for your respect towards their customs, traditions, and culture.

TRAVEL & MEETING POINT

We suggest you hold purchasing your airline ticket until six (6) weeks prior to departure date. Natural disasters, political changes, weather conditions and a range of other factors may require the cancelation of a program. The CFS typically takes a close look at local conditions 6-7 weeks prior to program beginning and makes a Go/No Go decision by then. Such a time frame still allows

for the purchase of deeply discounted airline tickets while protecting students from potential loss of airline ticket costs if CFS is forced to cancel a program.

The meeting point is at the lobby of [Hotel Yria](#), the project hotel near historical center of the town of Zakynthos (Zante), at 7:00pm the first day of the program. The Greek Island of Zakynthos (or Zante) is in the Ionian Sea. The island is a popular summer destination for many European tourists. The island is located less than 10 min away from the coast of the Peloponnese. The island has one airport – Zakynthos International Airport (ZTH).

Most visitors to Zakynthos arrive by bus. Buses from Athens to Zakynthos depart from Kifisou station, platform 38 and take about 7 hours. Kifisou station can be easily reached from Athens airport by bus X93 (€5), which takes about 45 minutes and arrives exactly where the bus to Zakynthos is waiting to depart. For bus schedule, see [Ktel Buses](#). There are also many ferries connecting the port of Kyllini (mainland Greece) and Zakynthos. For ferry schedule, see [Levante Ferries](#).



Figure 1: The entrance to the Yria Hotel



Figure 2: Entrance to the Department of the Environment at the Ionian University

MEALS & ACCOMMODATIONS

Students will stay at the family-run [Yria Hotel](#), located near the historical center of Zakynthos. The rooms are comfortable, with 2-4 beds, bathrooms with shower and WC, TV, 24-hour room service, lockers, hair dryers, LAN plugin connection, A/C and a fridge. Laundry service and free Wi-Fi are available at the hotel. Participants are not expected to bring any additional equipment, linen, or towels. Single rooms are available on request.

The program covers the cost of breakfast during teaching days only. **Other meals (lunch, dinners and meals during days off) are not included.** There are plenty inexpensive and mid-range local restaurants that offer a typical three-course Greek meal for 10-20 Euros (equivalent to \$11-22).

Participants should bring clothes and toiletries suitable for warm and sunny weather (26 -36°C), but should also prepare for rainy, windy, and chilly days. Zakynthos offers a lot of opportunities for sports and entertainment. Possible leisure activities during the siesta and days off are swimming, sunbathing, surfing, scuba diving, fishing, and sailing.

Participants can visit the most famous landmark of the island [Navagio beach](#), the numerous natural "Blue Caves", cut into cliffs around [Cape Skinari](#), the [mountain village Keri](#) is located in the far south of the island.

VISA REQUIREMENTS

There are no special visa requirements for U.S. citizen travelling to Europe, as long as they do not stay longer than 3 months. Passport's expiration date should exceed the stay by at least 3 months.

Citizens of other countries are asked to check the embassy website page at their home country for specific visa requirements.

PRACTICAL INFORMATION

International dialing code: The Greek international phone code is +30.

Money/Banks/Credit Cards: Greece's currency is the Euro, and there are several banks at Zakynthos. Most shops/supermarkets accept major credit cards (except for American Express, which is not always accepted). However, credit cards are not commonly used for small purchases (for example coffee at a café).

ATM Availability: There are several ATM machines at Zakynthos.

Local Language: The native language is Greek. Given that Zakynthos is a major tourist destination, many locals speak English at least at some level.

Measurement units: degree Celsius (°C), meter (m.), gram (gr.), liter (l)

ACADEMIC CREDITS & TRANSCRIPT

Attending students will be awarded 4 semester credit units (equivalent to 6 quarter credit units). Students will receive a letter grade for attending this field school based on the assessment matrix (above). This program provides a minimum of 80 direct instructional hours. Students are encouraged to discuss the transferability of credit units with faculty and the registrar at their home institutions prior to attending this program.

Students will be able to access their transcript through our School of Record – Culver-Stockton College. C-SC has authorized the National Student Clearinghouse to provide enrollment and degree verification (at <https://tsorder.studentclearinghouse.org/school/select>). Upon completion of a program, students will get an email from C-SC with a student ID that may be used to retrieve transcripts. The first set of transcripts will be provided at no cost, additional transcripts may require payment. If you have questions about ordering a transcript, contact the C-SC office of the registrar at registrar@culver.edu.

REQUIRED READINGS

Cronyn, J.M. 1990. The elements of archaeological conservation.

Scott, D. 1991. Metallography and microstructure of ancient and historic metals.

http://www.getty.edu/conservation/publications_resources/pdf_publications/metallography_microstructure.html

Stuart Barbara H., 2007. Analytical Techniques in Material Conservation, John Wiley & Sons, Athens.

RECOMMENDED READINGS

Scott, D., Podany, J and Considine, B (edit). 1994. Ancient & Historic Metals conservation & scientific research. Proceedings of a Symposium on Ancient and Historic Metals organized by the J. Paul Getty Museum and the Getty Conservation Institute, November 1991.

Hamilton. D. Methods of Conserving Archaeological Material from Underwater Sites.
<http://nautarch.tamu.edu/CRL/conservationmanual>

Burhke V., Jenkins R., Smith D, 1997, A Practical Guide for the Preparation of Specimens for X-Ray Fluorescence and X-Ray Diffraction Analysis, John Wiley & Sons, New York.

Cowley ed. J.M, 1993. Electron Diffraction Techniques, IUCR, Oxford University Press.

Ferraro J., Nakamoto K., 1994. Introductory Raman Spectroscopy, Academic Press, Boston.