



US (AZ): MULTI-SCALAR PHOTOGRAMMETRY FOR ARCHAEOLOGISTS

Course ID: HIS 489

Session 1: March 22-26, 2027

Session 2: June 7-11, 2027

Academic Credits: 2 Semester Credit Units (Equivalent to 3 Quarter Units)

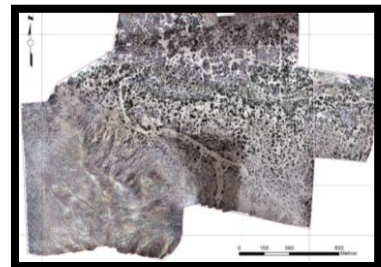
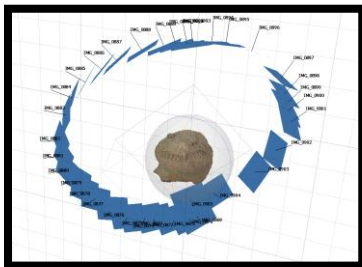
School of Record: Culver Stockton College

This program does not provide room and board. Several nearby restaurants within walking distance of NAU are available. A list of off-campus accommodation will be provided during the online orientation.

This program is designed to help students process and interpret digital spatial data collected by drones. We strongly encourage students to take our drone field school before attending this program.

DIRECTOR:

Dr. Kayeleigh Sharp, RPA & Researcher in Radiant Center for Remote Sensing at Northern Arizona University (kayeleigh.sharp@nau.edu)



INTRODUCTION

This course provides training for those who wish to incorporate 3D modeling into their academic or Cultural Resource Management work. This intensive, one week training session introduces participants to the various techniques of photogrammetric analysis, from the ground up. Participants will gain hands-on experience modeling archaeological sites, using data captured by 2D ground- and aerial-imagery to create 3D reconstructions of archaeological materials and sites (a.k.a. Structure from Motion). Participants will also be exposed to 3D scanning.

Participants will learn about the similarities and qualitative differences between industry standard tools (e.g., Agisoft Metashape), and Open-Source competitors for data processing, visualization and analysis. Participants will also learn about state-of-the-art techniques including reflectance transformation imaging (RTI) and 3D GIS. These tools form the essential foundation for advancing timesaving, minimally invasive archaeological recording that is vital in a range of archaeological

research and Cultural Resource Management settings. This course is designed for working professionals who wish to learn more about today's photogrammetric techniques and for those wishing to pursue careers that involve 3D reconstructions of archaeological artifacts, sites and landscapes.

IMPORTANT DISCLAIMER

The Anthropocene Research Center 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 ARC 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 ARC takes risks seriously. A committee of leading scholars review each field school location prior to approval. Once a program is accepted, the ARC continually monitors conditions at the program's site and so we can provide an experience that is as safe as possible.

The ARC 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, [Squaremouth.com](https://squaremouth.com) or [Travelguard.com](https://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 ARC field program. ARC is not qualified to provide medical advice. For all other concerns, please consult with ARC staff members or program director(s) – as appropriate.

COURSE OBJECTIVES

In this intensive field school, you will master the technical fundamentals of 3-dimensional archaeological site recording and reconstruction. Participants will learn how to carry out non-destructive surveys and high-quality documentation of archaeological objects, sites, and landscapes, each of which is applied differently for specific archaeological applications. You will also learn how to manage and enhance 3D (and 4D) data for analysis.

This course will take place in Northern Arizona, which is known for its exceptional landscapes and abundance of archaeological remains and living cultural heritage. Experiences will alternate between expert lectures and workshops and self-paced study activities. Students will learn to collect and process imagery for 3D modeling and archaeological site reconstruction, working with artifacts, archaeological excavations, and UAV surveys that are housed in the Digital Archaeology Lab teaching collections.

LEARNT SKILLS

We are aware and strongly support students who seek employment in the Cultural Resource Management sector – whether with private CRM companies or in government compliance agencies. CRM employers seek to understand the skills students learn at the field school. To that end, we are listing all the skills students will learn during this program. Each skill will be ranked at one of three levels at the end of the field school:

- ✓ **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.

Students will be trained in the following skills:

Skill	Description
Compliance-CRM State Legislation	Understand how to find and comply with individual state legislation, laws and rules concerning cultural and natural heritage
Image-based Data Recording	Ability to use digital tools for image capture and in-field data recording
3 and 4-dimensional Site Monitoring	Monitor constructions site and identify danger to cultural or natural heritage
Multi-modal Image Capture	Ability to take clear images of various artifacts, features, and landscapes in various light and field depth conditions
Image Editing	Ability to display, create & edit models in graphic software, such as Blender and Metashape.
Photogrammetry	Ability to create and interpret photographic, electromagnetic radiant imagery & patterns in 3D models

COURSE SCHEDULE

Week 1

Time	Activity
Monday 8:30-4:30pm	Welcome & Getting Started with Photogrammetry for Archaeologists; Workshop: Create your first 3D model (SfM and 3D Scanning)
Tuesday 8:30-4:30pm	Lecture: 3D artifact modeling and analysis Workshop: Create 3D models of structures and sites
Wednesday 8:30-4:30pm	Lecture: Best practices for 3D site recording and monitoring. Workshop: Create a 3D model of an anthropogenic landscape
Thursday 8:30-4:30pm	Lecture: Ethically reconstructing the past Workshop: Combining and editing 3D models at different scales
Friday 8:30-4:30pm	Final Exam: Putting it all together into a 3D archaeological reconstruction Farewell & Personal Reflections: Final model presentations & Evaluations

** Course schedule may be subject to change upon directors' discretion based on weather conditions or other limiting factors.*

TYPICAL WORKDAY

The first week is dedicated to instruction, site visits and preparation for research at Deadman Wash. From the second week forward, students will follow this daily schedule:

Time	Activity
8:30am	Workshop & Lectures Activities Begin
10:00-10:15am	Morning break
12:00pm-1:00pm	Lunch break
2:00-2:15pm	Afternoon break
2:15-4:30pm	Workshop & Lectures Activities End

** In case of inclement weather days, lectures and lab work will be performed.*

ACADEMIC GRADING MATRIX

Students will be graded based on their work as follows.

70%: Attend and participate in each scheduled day, including lecture and field and laboratory work

30%: Create final model demonstrating 3D modeling skills and utility of small (artifact), medium (site), and large (landscape) scales of documentation and analysis.

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.

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 ARC 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 time frame still allows for the purchase of competitively priced airline tickets, while protecting students from potential loss of ticket costs if the ARC is forced to cancel this program.

Students will meet with project staff members on Monday morning, the first day of field school, at 8:30 am at the Digital Archaeology Laboratory, Northern Arizona University. The laboratory is located in Building #52, Bilby Research Center.

If you missed your connection or your travel is delayed, please call, text or email the project director immediately. Local emergency cellular phone contact information will be provided to all enrolled students.



Figure 1: Bilby Research Center, 15 E Runke Dr Flagstaff AZ 86011

PREREQUISITES

None. This is a hands-on, experiential learning opportunity and students will study on-site how to conduct archaeological research under the direction of a range of specialists in the field. Field work involves physical work and exposure to the elements and thus requires a measure of understanding that this will not be the typical university learning environment. You will have to work outdoors in physically demanding environments, and students must plan ahead for both cold and hot weather conditions. Students are required to come equipped with sufficient excitement and an adequate understanding that fieldwork requires real, hard work, in the sun and wind and perhaps even snowy conditions. The work requires patience, discipline, and attention to detail.

MEALS & ACCOMMODATIONS

This program does not provide room or board. Students are responsible for their own accommodation and food. Flagstaff is the gateway to the Grand Canyon and offers hotels, motels and short-term rentals at a wide range of prices. A wide variety of restaurants and cousins are available in town, as well as on the NAU campus.

A list of potential accommodation will be provided during the online orientation.

VISA REQUIREMENTS

This is a domestic program, and no visa is needed for U.S. Citizens.

Non-US Citizens are asked to check the United States embassy website at their home country for specific visa requirements.

PROGRAM ETIQUETTE

Life in the communities around Flagstaff is focused on the outdoors and it is a college town

Flagstaff is a diverse community with folks attracted to the area from around the world. The atmosphere is laid-back, touristic and collegiate. There will be several occasions to enjoy the local city spirit and experience some of the most beautiful landscapes in North America. When traveling in the area, you are expected to be a conscientious and well-informed visitor, observing safety first.

You will also have many opportunities to meet and work alongside local university and community members. As such, each student is expected to be a project ambassador. You are thus expected to be patient, kind, and courteous with peer participants and in public.

EQUIPMENT LIST

- A laptop to be used during this class
- Lightweight hiking or walking shoes.
- Both lightweight jacket and outdoor wear as weather conditions change rapidly in northern Arizona.
- Hat, sunglasses and sunscreen.
- A positive attitude towards work, fun, study, and discovery!

PRACTICAL INFORMATION

International dialing code: 001 (if dialing from outside the US)

Money/Banks/Credit Cards: USD\$

ATM availability: Many ATM machines are available throughout Flagstaff

Local Language: English

Measure units: degree Fahrenheit (°F), foot/yard/mile, pound (lb), quart/gallon.

Field units: Meter (m.), Gram (gr.)

Time zone: Local time is Mountain Standard time.

ACADEMIC CREDITS & TRANSCRIPT

Attending students will be awarded 2 semester credit units (equivalent to 3 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 40 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 transcripts 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

Chen, Panpan, Rongji Luo, Wanfa Gu, Jiaqiang Zhang, Zhen Wang, Yan Tian, and Peng Lu. "How Can We Understand Past Human–Environment Interaction? Multiple Spatiotemporal 3D Reconstructions of Natural and Cultural Landscapes at the Dongzhao Site in Central China." *Journal of Archaeological Method and Theory* 33, no. 3 (2026): 51.

Ferdani, Daniele, Emanuel Demetrescu, Marco Cavalieri, Gloriana Pace, and Sara Lenzi. "3D modelling and visualization in field archaeology. From survey to interpretation of the past using digital technologies." *GROMA: Documenting Archaeology* 4 (2019).

Sharp, Kayeleigh, Mark Wagner, and Mary McCorvie. Stone, Water, People: Networks of Meaning in Illinois Rock Art. In *XXVIII Valcamonica Symposium 2021: Rock-Art, A Human Heritage*. Capo di Ponte (Bs), Italy: Centro Camuno di Studi Preistorici. (2021) 279-286.

Varol, Fatih, Yusuf Dünder, and Hasan Suat Aksu. "3D Modeling of Cultural Heritage Elements Displayed in a Museum Environment Using Close-Range Photogrammetry: The Louvre Museum Example." *Mersin Photogrammetry Journal* 8, no. 1 (2026): 81-94.