

**California State University International Programs – Florence, Italy
In collaboration with The University of Florence Architecture Department
DIDA – Dipartimento di Architettura**

**DIGITAL SURVEY AND REPRESENTATION OF
FORTE BELVEDERE**

WORKSHOP DESCRIPTION AND SYLLABUS - OCTOBER 2019

Class days/times: 2, 10, 17, 18, 21, 22, 24 October, 4 November (8 days, 40 hours)

Professor: Stefano Bertocci

Department of Architecture, University of Florence

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Tutors: Federico Cioli, Eugenia Bordini, Andrea Lumini

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Office hours: Wednesday, 15.30 - 17.30 (at the University of Florence Arch. Dept.)

Location: St. Verdiana, Architecture Department, Piazza. Ghiberti 27, 2nd floor

Students: (max) 33 CSU students | 11 DIDA students

Language: Italian and English

Prerequisites / Class Requirements: 4

- Laptop computer – required
- Digital camera – required
- AutoCAD (software and skills) – highly recommended
- Photoshop (software and skills) – highly recommended

COURSE DESCRIPTION

Digital preservation is the state-of-the-art practice in historic preservation, conservation and archaeology. It is an integrated documentation method that combines 3D laser scanning and high-resolution photography technologies for the digital preservation of cultural heritage sites of architectural and archaeological significance. Digital preservation data is more accurate and more economically produced than information from surveys using traditional techniques and it produces best practice databases for cultural heritage site management. Digital preservation data has many other uses such as architectural design, virtual reconstruction, 3D animation and virtual tours. This course will match theory and practice in order to provide basic skills of digital survey in historical sites for architectural design. Students will be involved in all phases: research, data capture and data processing. The first theoretical part includes an introduction to digital survey in the classroom. The data acquisition phase will be carried out at the Forte Belvedere site on Oct. 18 and 25 (to be confirmed) and will focus on some internal rooms to be used as a museum of the history and the development of the Florence historical center. In addition to the on-site work, the course includes further lessons concerning data management and the use of software, aimed at producing the necessary materials to support the further design step. The tutors will be available during the hours indicated in the previous “office hours” section to help students regarding doubts or clarifications.

This workshop is an integral part of CSU Italy fall semester architecture program ARC 401/3/5A Architecture Design/Project/Lecture.

ATTENDANCE AND PARTICIPATION

Attendance in this workshop is mandatory. Participation in this workshop will count 10% of your fall semester final architecture grade (for ARC 401/3/5A).

OBJECTIVES, GOALS AND OUTCOMES

The main goal of the course is to learn the theory and practice of digital preservation through analysis of case study examples and from technical information presented during the class. The students will be divided into groups of four in which CSU students will collaborate with Italian students of DIDA – Department of Architecture.

Corollary objectives are:

- Acquire digital graphic tools and language for the documentation and representation of historical and archaeological features of cultural heritage sites.
- Acquire digital graphic skills in the representation of historic space and form.
- Integrate these tools and skills within the morphology of topography and landscape.

METHODS USED IN CLASS

The course will consist of:

- Lectures
- In-class discussions
- On site field workshop – 18 and 25 October (to be confirmed)
- Workshop with Italian students
- Data processing and post production work

Students will work in teams of four in which 3 CSU students will collaborate with 1 Italian student from the University of Florence, DIDA – Department of Architecture.

TEXTBOOKS:

OPTIONAL

1. S. Bertocci, M. Bini, Manuale di rilievo architettonico e urbano, città studi ed. Torino, 2012 (38€) [ITA]
2. Masada notebooks. Report of the research project 2013. Vol. 1 (18€) [ENG]
3. Masada notebooks. Report of the research project 2014. Vol. 2 (18€) [ENG]

OPEN DATA [ITA/ENG]

4. S. Bertocci, F. Cioli, E. Bordini (2018). Virtual models for the valorisation and promotion of the business heritage in the historic centre of Florence:

https://www.researchgate.net/publication/331101210_Virtual_models_for_the_valorisation_and_promotion_of_the_business_heritage_in_the_historic_centre_of_Florence

5. S. Bertocci, F. Cioli (2018). The documentation of the historical commercial activities in Florence city centre:

https://www.researchgate.net/publication/330221921_The_documentation_of_the_historical_commercial_activities_in_Florence_city_centre

ADDITIONAL CLASS COSTS

- Insurance: 6,50 € each one
- Any costs of public transport up to Forte Belvedere + packed lunch
- Costs to print the drawings and pictures

CLASS VISIT – DEPARTMENT OF ARCHITECTURE, UNIVERSITY OF FLORENCE

It will be possible to participate as auditors to some presentations, workshops, lessons at the Department of Architecture of University of Florence.

Material

- Notebook/Sketchbook (mandatory - it will form an integral part of the documents to present at the end of the course)
- Drawing tools
- Other materials to be announced in class

CLASS SCHEDULE/CALENDAR – OCTOBER 2019

Wednesday 2nd - Introduction 13.30 – 16.30 (location: CSU, aula magna)

Documenting architecture. General definition and scientific framework. Languages for representing architecture. History of the measuring tools in survey documentation. Introduction to 3D digital documentation: laser-scanner survey and photogrammetry SFM.

Thursday 10th – Methodologies and tools 14.00 – 17.00 (location: University of Florence, St. Verdiana, Architecture Department, Piazza Ghiberti 27, 2nd floor, class: to be announced)

The topographic survey and methods for detailed documentation. Methods and tools for 3D laser scanner surveying and high-resolution photogrammetric data capture. Proper coverage of the object to be documented. The metadata and levels of detail. From data acquisition to data retrieval.

Thursday 17th – Digital survey on site 9.00 – 13.00 | 14.00 - 17.00 Meeting at Forte Belvedere at 9.00

During the workshop the students will be involved in data capture, using digital camera and Structure from Motion (SfM) methodologies and learning about how to perform a laser-scanner survey (which will be used exclusively by tutors). The day will focus on acquiring data and historical information in order to develop the necessary material for a musealization project.

Friday 18th – Software and management of data 14.00 – 18.00 (location: CSU?)

Coordination, reading and interpretation of the raw 3D data. The postproduction process: processing the point-cloud to achieve graphic results. Direct 2D vectorization process from the point-cloud into CAD: plans, sections, elevations.

Monday 21st – Software and management of data 14.00 – 18.00 (location: CSU?)

Coordination, reading and interpretation of the raw 3D data. The postproduction process: processing the point-cloud to achieve graphic results. Direct 2D vectorization process from the point-cloud into CAD: plans, sections, elevations.

Tuesday 22nd – Laboratory 9.00 – 13.00 | 14.00 – 17.00 (University of Florence, St. Verdiana, Architecture Department, Piazza Ghiberti 27, 2nd floor, class: to be announced)

The tutors will follow the individual groups in the use of the software and in the management of the data.

Wednesday 23rd – Digital survey on site 9.00 – 13.00 | 14.00 – 17.00

Meeting at Forte Belvedere at 10.00

During the workshop the students will be involved in data capture, using digital camera and Structure from Motion (SfM) methodologies and learning about how to perform a laser-scanner survey (which will be used exclusively by tutors). The day will be focused on acquire data and historical information in order to develop the necessary material for a musealization project.

NOVEMBER

Monday 4th – End of work and final public presentations 16.00 – 21.00 (at CSU)