Spring 2022 Course Description

ARCH 573 Design: Technology & Performance / Section E1
Mondays & Wednesdays / 1:00 to 5:50 PM / Temple Buell Hall

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ADAPTIVE REUSE STUDIO

“The greenest building is one that is already built.”

- Carl Elefante (*Forum Journal* 21:4, 2007)

Photos: Project Site, Hangar 4 at the former Chanute Air Force Base in Rantoul, Illinois.

ARCH 573: COURSE CATALOG DESCRIPTION

Design studio investigations of buildings and systems focusing on structure, enclosure, technology, and performance. Integration of building materials, components and systems and their impact on the design, construction, and sustainability of buildings. 6 credit hours. Prerequisite: Graduate standing.

ADAPTIVE REUSE: NEW LIFE FOR AN OLD BUILDING

Architects can contribute to the sustainability of the built environment by envisioning ways to **adapt older buildings for new purposes**; literally, by sustaining existing buildings rather than demolishing them to build anew. The Pritzker-Prize-winning architect Anne Lacaton has said that the demolition of an existing building “is a waste of many things—a waste of energy, a waste of material, and a waste of history.”[1]

Instead of demolishing a building once it no longer serves its original purpose, today there is growing interest in re-purposing existing buildings, finding ways to make them viable for new uses and extend their lifespans into the future, thus saving embodied energy and reducing waste. The Environmental Protection Agency notes that even an energy-efficient new building takes approximately 65 years to recover the embodied energy lost in demolishing a comparable existing building.[2]

This studio will explore design methods to engage these issues. Students will propose a new function or functions for an existing structure and design the modifications, interventions, and/or additions to achieve the desired outcomes. We will work with the existing structural system and shell, modifying them as necessary, and designing new spaces to meet projected needs.

The design process will focus on upgrading the existing building in two critical aspects: (1) **program** and (2) **energy performance**. How can this existing building’s structure form the framework for a new program? How can we improve the energy performance of an older building using current building-envelope technologies and renewable energy sources, raising it from 20th-century to 21st-century standards and beyond? How do we transform an empty, abandoned building into a vibrant and active space for new purposes?

[1] https://www.pritzkerprize.com/laureates/anne-lacaton-and-jean-philippe-vassal

PROJECT SITE

Our project site will be the existing building known as **Hangar 4** at the former Chanute Air Force Base, an aviation training facility that was decommissioned in 1993 and converted to civilian use. The site is located in Rantoul, Illinois, about 15 miles north of Urbana. Built in 1941 as an airplane hangar with adjacent classrooms and workshops, the 218,000-square-feet Hangar 4 building is currently vacant and in disrepair. It is now owned by the village of Rantoul, which is actively seeking new occupants to take over the building and give it new life. Your task is to propose and design a new future for this building.

The building is one of four airplane hangars of similar size at the Chanute site; the other three buildings have already been adapted to new uses including a hemp growing facility, an industrial manufacturing plant, and an indoor motocross racing track.

At the beginning of the semester, students will have an opportunity to visit Hangar 4 to observe the current conditions and learn techniques for documenting the existing building.

STUDIO PARAMETERS

Following initial site research and precedent studies, students will work on a semester-long design project for the adaptive reuse of Hangar 4. In order to develop collaboration skills and enable a high level of depth and detail, students will work on the project in **teams of two**. In consultation with the instructor, each team will have the opportunity to propose a unique program for their project.

In addition to the adaptation of older structures for new uses, the studio will focus on learning to design for building performance, especially energy, daylighting, and building-integrated solar power. Students will use energy- and daylighting-analysis software as an integral design tool to inform, test, and verify the development of the project throughout the process (prior knowledge of the software is not required). Three-dimensional modeling, including digital and physical models at a range of scales, will also be emphasized throughout the process.

[2] https://www.epa.gov/smartgrowth/smart-growth-and-preservation-existing-and-historic-buildings#1