

## Passive House and the Missing Middle:

### *An Exploration of High-Performance Housing*



Much has been made in the last 5 years of the changing density of Portland. With 400,000 more people expected to move here by 2035, the city is facing a housing crisis unlike any in its history. In response to this crisis, there is a push towards the densification of the city's established residential neighborhoods, and developers are responding with 4 and 5 story, partial- to full-block apartment buildings. These buildings can feel massively out of scale with their surroundings, much to the dismay of the neighbors.

This development has renewed interest in a housing type known as the Missing Middle. A fundamental building block in pre-1940's neighborhoods, the Missing Middle is a range of multi-unit or clustered housing types compatible in scale with single-family homes that help meet the growing demand for walkable urban living, lower perceived density, and the creation of community. A variety of building types are considered Missing Middle housing including duplexes, ADUs, townhouses, and Live/Work.

This building boom is also creating the city's rental housing stock for the next 50-100 years which will be a major source of Portland's energy consumption over the life of these buildings. If the city is to achieve the 2015 Climate Action Plan's goal of all new buildings being carbon neutral by 2030 then we must begin developing buildings that push towards ever greater energy efficiency. A potential path to achieving these high-performance goals is designing and building to the Passive House standard. This standard is extremely rigorous from an energy standpoint and is on the leading edge of building performance however, Passive House projects are largely criticized for oversimplified forms and limited design range.

### **STUDIO OBJECTIVE**

This studio will explore smart urban growth through the development of high-performance Passive House-certified multi-family housing with an emphasis on design quality and innovation. Students will be pushed to develop advanced architectural solutions that address the needs of a growing neighborhood while meeting the aggressive energy saving and technical detailing requirements of Passive House. This studio will focus on the necessary intersection of design and building science that results in beautiful, high-performance buildings that have a positive impact in their neighborhoods.

### **PROCESS**

The studio will introduce students to the pace and rigor of the design process within a professional firm. Organized around the framework of integrating design and sustainable strategies, the studio will explore these at all stages from initial Design Concept through the development of technical details. This process will be supported by explorations in thermal modeling and analysis and opportunities for tours and lectures led by engineers, developers, and other professionals engaged in high-performance urban projects.