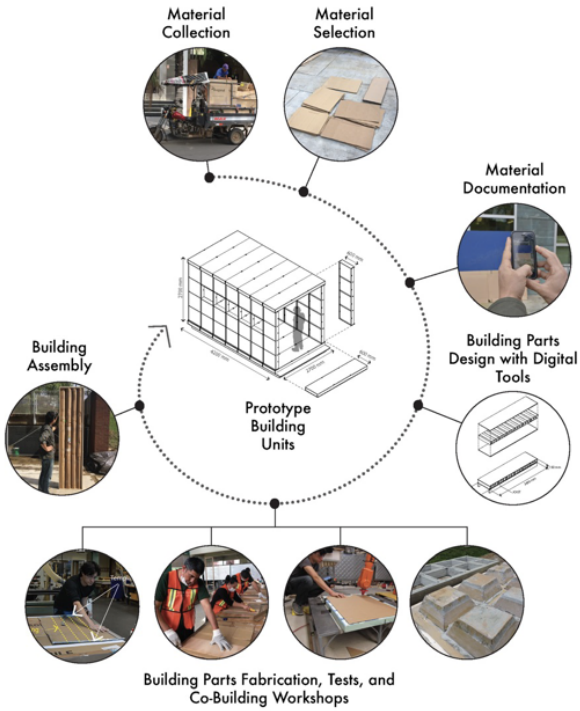
ARCH 7101 Design Studio | Spring 2023 | 6 Credits | MWF 2-5:15 pm

Tapping into Urban Waste for Sustainable Building Materials

Craft and Digital-based Strategies to Make Building Materials from Waste

Julio Diarte, PhD (Instructor) | email: juliodiarte@uncc.edu | Storrs 122D



The studio links two of the most critical challenges in urban areas worldwide: The rapid growth of urban solid waste and the quantitative and qualitative housing deficit in urban areas. It is estimated that waste production rates will increase from 2 billion tons registered in 2016 to approximately 3.4 billion tons by 2050 (Yao et al. 2018, 17). Although high-income level countries will continue producing most of the urban waste, production in low-income level countries will also triple by 2050, triggering an urgent need for alternative and creative solutions. In this studio, we will review current practices dedicated to rethinking waste as a resource for architecture and experiment with alternative uses of solid waste materials by implementing craft-based and digital-based methods and technologies. Students will explore three different methods to reuse waste: densification, reconfiguration, and transformation (Hebel, Heisel, and Wisniewska 2014), and will use them to make building parts for housing using plastics, paper products, and construction waste, reclaimed wood, fabrics, among other materials. The goal is for students to learn a theoretical framework for regenerating the value of urban waste, how to design and develop a workflow to fabricate building materials from waste, and how to integrate analog and digital fabrication tools in the production process of building parts.