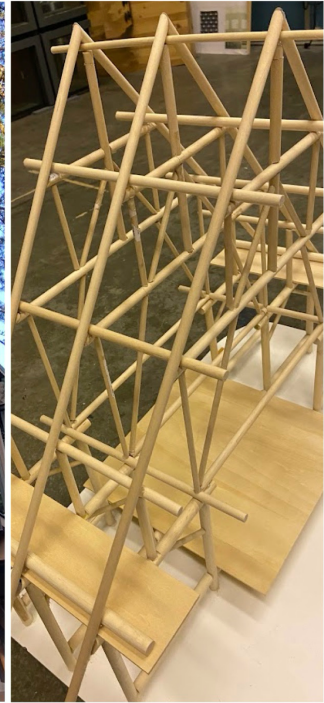




Founders Hall, University of Washington
LMN Architects, 2022



Bloedel Hall, University of Washington
Grant, Copeland, Chervenak, 1970



Paradise Lodge, Mt. Rainier (model)
Ruby Anderson, Kahlia DeVenaro

ARCHITECTURE 498

Mass Timber Architecture: Material, Structure, and Detail

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Course Description:

Mass timber has arrived as a significant part of a low-carbon construction future in the Pacific Northwest. While different courses and research projects at the University of Washington address particular, disciplinary aspects of mass timber buildings, none provide an overview of the complex alignment of natural resources, forestry industries, design sensibilities, structural realities and construction logistics that mass timber buildings connect to. This course will provide a building technology-centered discussion of the current state of mass timber to students from many different parts of the University.

This course would appeal directly to architecture, structural engineering and construction management students. With a central, organizing focus on the material itself (mass timber), the class would then branch out to address the interconnected topics that lead to its use as a building material including: the natural sourcing of lumber, the production of different timber products, the structural capacities and limitations of the material, structural form, design decision-making, the embodied carbon of mass timber, fire concerns, detailing, and the construction assembly.

Architecture students would leave the class with necessary expertise to schematically design with mass timber in their studio work. Structural engineering students would be able to understand the basic assembly and behavior of structural elements, different connection types, and further explore the lateral challenges of building with timber in a high seismic zone. Construction management students would be able to understand the logistical challenges of sourcing, sequencing, moisture control during construction and cost basics of mass timber for use in future courses. Presenting all these topics in a single class would provide a common basis for the different disciplines to draw from. Mass timber encourages collaboration, and this course would provide an educational opportunity to foster a closer relationship between professions.

While mass timber products are leading to new building forms, this work also recalls the long history of lumber production and timber architecture in the Pacific Northwest region. This architectural legacy in wood is a central part of Native cultures' material practice, like the longhouses of the Coast Salish. It was also the center of the white-settler, resource-extraction economy that fueled growth of the region in the mid 1800s, with an infrastructure of timber trestles, mill buildings and bridges. In the 20th century, a rich modern design language in timber emerged in the Northwest, distinct from any other part of the country. This legacy in timber architecture would be an essential part of the course, complimenting topic discussions, while providing grounding and perspective to the current design efforts.

Potential Course Schedule:

Week 1:	Intro to Timber Architecture in the Pacific Northwest, Past and Present Tour of Campus Timber Buildings, Current Projects
Week 2:	Northwest Forest Ecology, History & Management Practices Wood Species Samples, UW Campus tree tour
Week 3:	Development of Wood Products for Construction -Solid wood to Engineered Production Processes of Plywood, Glulam, NLT, DLT, CLT, etc.
Week 4:	Material Capacities and Behavior Testing, Properties, Variations
Week 5:	Timber Assemblies as Structures, Past & Present Modeling Gravity Resistance in Timber
Week 6:	Timber Structures in High-Seismic Zones Building Construction Type; Hazards, Systems, & Hybrids
Week 7:	Joining Timber - Connections and Construction Historic Connections (Nordic, Japanese, American), Connection Alternatives
Week 8:	Designing for Fire-Resistance (Members and Connections) Calculating Embodied Carbon
Week 9:	Digital Timber +Emerging Fabrication methods, potentials Optimization of Form, Connection, Assembly

Week 10: Environmental Systems in Timber Buildings, Cladding & Weather Coordination, Vibrations/Acoustics, Moisture Control

Week 11: A Tall Timber Future

Class time would alternate between lectures presenting new content (offered by myself and other guest speakers), and a series of demonstrations/tours that would provide a more in-depth understanding of particular topics. For example, a lecture on timber connections and joinery would be followed by a hands-on exercise with timber blocks and fasteners. Funds would also be used to create a series of joint details, and physical models to enrich instruction. A lecture on the history of timber architecture in the Northwest would be followed by a walking-tour of old timber buildings on campus (like the 1967 Forestry building, and the 1919 Crew Shell house). The University of Washington is also home to two buildings which utilize mass timber (2022 Founders Hall, LMN Architects, and 2021 Health Sciences Education Building, Miller Hull Architects).

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