



Mass Timber Design Focus in the UO Master of Science in Architecture Degree Program

Overview

The Department of Architecture at the University of Oregon (UO) initiated a new focus in Mass Timber Design within our existing Master of Science degree program in fall 2021. This focus is designed to fulfill the requirements for a one-year 45 credit (minimum) post-professional degree program for students who have an accredited degree in architecture and want to focus a year of study on topics in advanced timber design. This program of study takes advantage of the resources of the TallWood Design Institute (TDI), a collaboration between UO's College of Design and Oregon State University's (OSU) Colleges of Forestry and Engineering. TDI is funded by the Oregon State Legislature to promote environmental stewardship and economic development through research, testing, outreach, and education focused on the advancement of sustainably sourced engineered timber products. TDI has extensive lab facilities at both UO and OSU, including the A.A. "Red" Emerson Advanced Wood Products Lab at OSU's College of Forestry. For further information on TDI and its resources and activities please see: <http://tallwoodinstitute.org>

This focus within the MS degree is the first step in what is intended to become a joint UO-OSU Master's degree program in Mass Timber Design with participation by the three Colleges that collaborate in TDI, with students coming from the disciplines of architecture, wood science, civil and construction engineering. Realizing the joint UO-OSU Master's degree requires several steps taken over several years and the first critical one is launching this pilot program within the UO MS Architecture degree, which will serve as a testing ground and marketing study as well as providing advanced education in mass timber design for the first five students who entered the program this fall. Discussions are ongoing with leadership in the Colleges of Design, Forestry and Engineering on the formation of the joint Master's degree program.

While the initial program is within the UO Architecture Department, with Professor Judith Sheine as the lead and student advisor, the program includes courses in OSU's Department of Wood Science and Engineering in the College of Forestry, one course at UO will be co-taught with a Professor of Civil Engineering who specializes in timber design, and one will be co-taught with a TDI staff member with a MS degree in Wood Science and Engineering. Faculty from the three TDI associated colleges will be available for consultation on topics, for guest lectures and to serve on students' master's committees.

Students in the mass timber design focus in UO's MS in Architecture will be taking a series of courses and will also be expected to produce an independent research project in mass timber design. They will develop a proposal in the fall term, identify the members of their Master's committee (Sheine will be one of the members on all of the initial five student committees), and then continue to develop the research topic and to demonstrate it in a mass timber design project, in the winter and spring terms (Note: both UO and OSU are on the quarter system, with aligned fall, winter and spring terms). The sequence of courses and their content was developed in a process led by Professor Sheine, with input from several UO Architecture faculty members who are involved in mass timber research (Professors Alison Kwok and Kevin Van Den Wymelenberg, Associate Professors Mark Donofrio and Nancy Cheng), Professor of Civil Engineering, California State Polytechnic University, Pomona, Mikhail Gershfeld (who has consulted on a series of mass timber design studios taught by Professor Sheine, first at Cal Poly Pomona and then at UO, some of them in collaboration with Gershfeld's Advanced Timber Design course at Cal Poly Pomona), Professor Eric Hansen, Head of the Department of Wood Science and Engineering at OSU, and TDI Outreach Coordinator Evan Schmidt.

The outline of the 2021-22 program and short descriptions of the courses and workshops offered follows:

Department of Architecture

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FALL 2021

OSU WSE 520 The Global Context of the Forest Sector*

3 credits

T/TH 12 – 1:20 PM Instructor: Rajat Panwar

Provides a broad knowledge base of business and marketing practices in the global forest industry. Includes a module on research ethics that fulfills OSU Graduate School requirements.

OSU WSE 599 Special Topics: Wood Science for Mass Timber Design*

1 credit

T 2-2:50 PM Instructor: Evan Schmidt

Provides students with an understanding of basic wood science principles and how they apply to mass timber design.

UO ARCH 584 Architectural Design Studio: Timber Tectonics in the Digital Age*

6 credits

MWF 1:00 – 4:50 PM Instructor: Nancy Cheng

Note: this studio is taught in collaboration with **OSU WSE 425** Timber Tectonics in the Digital Age.

Instructor: Mariapaola Riggio

An exploration of the advances in design, construction, and fabrication of timber buildings. Includes experimentation with both physical and digital models and a final project

UO ARCH 601 Independent Study/Research project : Mass Timber Design

4 credits

MW 10:00 – 11:50 AM Instructor: Judith Sheine

Introduction to mass timber design and research topics, development of independent research topic and project proposals. Includes a symposium in which faculty working on mass timber design topics present their work for students to understand the breadth of research topics and to help identify appropriate Master's committee members.

Topics may include: Timber and Healthcare; Mass Timber Systems for Industrial Buildings; Design for Deconstruction and Reconstruction; Mass Timber Panel Retrofits for Energy and Seismic Upgrades; LCA, Carbon and Net-Zero Design; Modular School and Housing Design.

Subtotal

14 credits

TallWood Design Institute Workshops

Cadwork Workshop (online)

September 14 – October 7, 2021 T/TH 10 – 11:50 AM Instructor: Laurent Décosterd

Workshop on software for mass timber digital fabrication

TDI Design-Build Workshop

November 4-6, 2021 8:30 AM – 5:30 PM Instructors: Judith Sheine, Mikhail Gershfeld, TDI staff with guest lectures from Chris Evans of Swinerton's Timberlab and Stefan Schneider of Cut My Timbers

Workshop for design and construction professionals on design, software, digital fabrication and construction of mass timber. Includes the hands-on design, fabrication and construction of a CLT pavilion In TDI's Emmerson Lab

Note: Plans for a one-week trip to the annual Holzbau conference in early December in Austria, combined with a tour of mass timber manufacturing facilities and mass timber buildings, were cancelled due to the uncertainties of travel during the pandemic; travel will be planned for December 2022, international travel permitting.

WINTER 2022

UO ARCH 510 Advanced Mass Timber Design (Mass-ter Builder)* T/TH 2:00 – 3:50 PM Instructors: Judith Sheine, Mikhail Gershfeld This seminar will be an introduction to mass timber integrated building design and include presentations by professional teams (architects, engineers, contractors) on the design and construction process of mass timber buildings, largely in the Portland, OR region, in class and in building tours. Guest firms will include Lever Architecture, Hacker Architects, SRG Partnership, FFA Architecture + Interiors, Holmes Structures, DCI Mass Timber +, KPFF, Swinerton Builders and Andersen Construction Co.	4 credits
UO ARCH 601 Independent Study/Research project: Mass Timber Design MW 10:00 – 11:50 AM Instructor: Judith Sheine Continued development of research topic	4 credits
UO ARCH 619 Terminal Project: Integrated Timber Design Studio MWF 1:00 – 4:50 PM Instructor: Judith Sheine Exploration and demonstration of research topic through design project	8 credits
Subtotal	16 credits

SPRING 2022

UO ARCH 606 TallWood Design Institute Seminar (Special Topics)* T/TH 2:00 – 3:50 PM Instructors: Judith Sheine, Evan Schmidt Presentations by UO and OSU faculty, visiting faculty and professionals on mass timber research topics; topics may include structural design, fire resistance, durability, adhesives, LCA, acoustics, net-zero design, constructability and economics, modular and off-site construction	4 credits
UO ARCH 601 Independent Study/Research project: Mass Timber Design MW 10:00 – 11:50 AM Instructor: Judith Sheine Continued development of research topic	4 credits
UO ARCH 619 Terminal Project: Integrated Timber Design Studio MWF 1:00 – 4:50 PM Instructor: Judith Sheine Continued exploration and demonstration of research topic through design project	8 credits
Note: Research topics and projects will be presented publicly at the end of spring term.	
Subtotal	16 credits
Total credits	46 credits

Note: Reading lists and other resources are provided for each course. Students have access to TDI resources, including the Emmerson Lab, associated faculty and professionals including those in the TDI REACTS Consortium, and the many mass timber buildings in the region.

Note: Courses marked with an * are open to graduate students outside of this focus area, including those in the MArch program.