

DFMA Design Build Workshop

February 9-11, 2023

Day 1 - Introduction to DFMA		Instructor	Description
9:00am	INTRODUCTION: To CAWP & DFMA	Jason Chiu	Participants will be introduced to the Centre for Advanced Wood Processing and the UBC Sustainable Timber Building Cluster(STBE) and its support services for the industry. The STBE is a collaboration between UBC School of Architecture and Landscape Architecture (SALA), UBC Civil Engineering and UBC Forestry Wood Science. Design for Manufacturing and Assembly (DFMA) is a concept where the relationships between design, manufacturing capabilities and assembly play vital roles in the construction of mass-timber buildings. The concepts will be discussed in detail during the 3-day workshop.
9:15am	INTRODUCTION: Participants		Round table introduction
9:30	LECTURE: Design Precedents	Prof AnnaLisa Meyboom, School of Architecture & Landscape Architecture, UBC	Prof. AnnaLisa Meyboom from the School of Architecture and Landscape Architecture at UBC will discuss state of the art in mass timber and the implications of the DFMA on the design process.
10:00	LECTURE: Mass Timber Design - Structural Basics and Connection	Ilana Danzig, Aspect Engineering	Ilana Danzig from Aspect Engineering will provide a general overview into engineering considerations when designing with mass-timber. In addition to the selection of material, the design of the connection systems are pivotal to the structural performance.
10:30	Coffee Break		
10:45	LECTURE CON'T: Mass Timber Design - Structural Basics and Connections		
11:30	LECTURE: Introduction to CNC and CAD/CAM	Joern Dettmer, UBC Wood Science	Joern Dettmer from UBC Wood Science will introduce the concepts of CAD/CAM technology used in the prefabricated mass-timber industry. The combination of information and equipment allow projects to be prefabricated to tolerances rarely achieved in traditional construction methods.
12noon	LUNCH & LEARN: Rothoblaas	Rothoblaas	Rothoblaas is an leading Italian developer of high tech solutions for the mass-timber sector. In this session participants will learn about the range of products that Rothoblaas offers to improve installation efficiency of mass-timber projects. Participants will be encouraged to incorporate connection solutions into their designs.
12:45	PROJECT INTRODUCTION	AnnaLisa Meyboom, Ilana Danzig, Joern Dettmer	Participants will be introduced to the design-build exercise for the workshop. Groups will be provided with a list of materials and design a structure based on the specifications.
1:00pm	DESIGN DEVELOPMENT: Group Designs - Physical models to scale	AnnaLisa Meyboom, Ilana Danzig, Joern Dettmer	Participants will be placed into groups to initiate the design process based on the material and manufacturing constraints. The groups will design and fabricate a scale model of their structure. Participants will digitally design a structure and prototype a scale model. The model will be discussed and critique by industry professionals
3:30pm	DESIGN REVIEW: Architectural Design & Engineering	AnnaLisa Meyboom, Ilana Danzig, Joern Dettmer & Panel	Industry experts from the architecture, engineering and manufacturing community will be on-hand to critique the designs. The feedback will be incorporated into the design for fabrication.
5:00pm	Wrap up		

Day 2 - Design/Engineering Review			
9:00am	DAY 1 REVIEW	AnnaLisa Meyboom, Joern Dettmer	Review works produced on Day 1 by the groups and the selected design
9:15am	LECTURE: Introduction to Cadwork	CADWORK	Cadwork is a construction software for the wood and engineered wood products industry. The software provides tools to support the building process from concept to installation. Students will be introduced to the suite of software available. The workshop will utilize the CAD/CAM solutions to seamlessly translate digital design models into manufacturing solutions where the structures will be fabricated on the Hundegger mass-timber processing centre.
10:00am	DEMONSTRATION: Design, CAD/CAM, Simulation	CADWORK	The process of analyzing the project designs will be presented. Programmers will need to review the projects to optimized the manufacturing process. Group designs will be uploaded into Cadwork CAD/CAM software and a simulation of their designs will be generated for fabrication.
11:00am	LECTURE: BIM Software - Kai @ CadMakers	CADmakers	CADmakers is an industry-leading construction and manufacturing technology company. They provide solutions to the construction industry to through the integration of Digital Construction Twin and Digital Fabrication Twin solutions. The company will present case-study examples and provide participants with tools and concepts to design projects for manufacturing and installation efficiency.
12:00noon	LUNCH & CASE STUDY: UBC Timber Building Tour - Case Study presentation by John Boys	John Boys, Nicola Logworks	John Boys is one of North America's pioneers in the mass-timber field. He is the owner of Nicola Logworks, a log and timber company he started over 30 years ago. His team was the first to install a mass-timber CLT panel in British Columbia. His expertise was called upon to install mass-timber floor panels in the UBC Earth and Ocean Sciences Building. His expertise continues to be called on mass-timber specialty projects. John will speak about lessons learned and provide participants with key information to designing projects for efficient manufacturing and installation.
1:15pm	CASE STUDY: Lucas Epp @ StructureCraft Builders	Lucas Epp, StructureCraft	StructureCraft Builders is a premier Engineer-Build timber building solutions provider. The company provides engineering and fabrication services to the client, designers and contractors. Participants will be presented with case-study where lessons learned from various projects will be discussed.
2:00pm	MATERIAL BREAKOUT/MANUFACTURING		Participants will learn about Bill of Materials and nested-based manufacturing to reduce material cost by improving material yield.
4:30pm	WRAP UP		
Day 3 - Manufacturing			
9:00am-4:00pm	MANUFACTURING & ASSEMBLY		Participants will work together to fabricate and assembly a structure.